Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/5/2018 7:38:19 PM
To: Lauren Wilk [lwilk@aluminum.org]
Subject: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi Lauren,
You are confirmed for 45 minute meeting on Friday, March 2, 2018 at 3:00pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Monday, February 05, 2018 12:56 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Aluminum Association Meeting Request

Thanks, Emily. We'll take the meeting on March 2 at 3pm, and I'll firm up attendees on our end.

Let me know what details you need in advance of the meeting.

Much appreciated!

Lauren

Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | Ex. 6 Personal Privacy (PP) 6 | F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Monday, February 05, 2018 12:48 PM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Aluminum Association Meeting Request

Hi Lauren,

It looks like Bill Wehrum could be available for a 45 minute meeting on Friday, March 2, 2018 at 3:00pm.

Please advise if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Thursday, February 01, 2018 12:06 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Aluminum Association Meeting Request

Emily and Josh –

Will Lovett suggested I connect with you on scheduling a meeting with Assistant Administrator Wehrum for a few representatives of the aluminum industry. We have availability on the following dates: February 16, 20, 21, 23, 26, 27, 28 or March 1 (but we can certainly be flexible if an alternative date is necessary).

The Aluminum Association is active with EPA on a number of issues – and specifically, the members of our Aluminum Transportation Group (ATG) would very much like to hear directly from Mr. Wehrum about the Administration's priorities related to automotive GHG emissions and fuel economy regulations. The ATG represents the Association's member companies that produce aluminum for use in cars and trucks, including Alcoa, Arconic, Novelis, Rio Tinto and others.

The aluminum industry plays a significant role in the automotive supply chain, and the pounds of aluminum content per vehicle has grown by more than 30 percent over the past decade. Driven by that auto sector growth, the aluminum industry has announced or completed U.S. plant expansions and investments of more than $2.6 billion since 2013. Already this year, Novelis announced that it was investing $300 million in a new greenfield automotive finishing facility in Guthrie, Kentucky. The industry is acutely interested in the outcome of the midterm review on vehicle fuel economy, and we have met previously with the White House, OMB, NHTSA, CARB and others on this topic.

I'd be happy to answer any questions or provide additional background, if that's helpful.

Thanks so much,

Lauren

The Aluminum Association

Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | Ex. 6 Personal Privacy (PP) | F 703.358.2961
JOIN THE CONVERSATION:

Message

From: Lauren Wilk [lwilk@aluminum.org]
Sent: 2/28/2018 3:13:28 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]
CC: Matt Meenan [mmeenan@aluminum.org]
Subject: RE: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request

Hi, Emily. I wanted to send you a list of attendees for tomorrow's meeting at EPA. My colleague Matt Meenan (copied here) will be with the group, if you need to reach him for any reason. Please let me know if you need any additional information from me in advance of the meeting.

- Henry Gordinier, Tri-Arrows
- Ganesh Panneer, Novelis
- Delphine Dahan-Kocher, Constellium
- Dan Minwell, Constellium
- Mario Greco, Arconic
- Mike Belwood, Arconic
- Joe Quinn, Aluminum Association
- Matt Meenan, Aluminum Association
- John Fitzpatrick, Stratacomm

Much appreciated!

Lauren

The Aluminum Association
Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, February 07, 2018 3:02 PM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request

Hi Lauren,
You are confirmed for 45 minute meeting on Thursday, March 1, 2018 at 4:00pm with Bill Wehrum.
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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Wednesday, February 07, 2018 2:59 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Thanks so much, Emily. That's perfect.

I'll circle back, closer to the meeting, with a list of attendees. Let me know if you need anything else in the meantime.

Lauren

The Aluminum Association
Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | Ex. 6 Personal Privacy (PP) | F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, February 07, 2018 12:33 PM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi Lauren,

It looks like we could fit this in on Thursday, March 1 at 4:00pm. Let me know if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Wednesday, February 07, 2018 11:01 AM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi, Emily. One of the technical experts I was hoping to bring in for our meeting with Mr. Wehrum will unfortunately be out of the country on Friday 3/2. Is there any chance that Mr. Wehrum would be available to meet on Thursday 3/1, or sometime March 12-16? If not, we'll keep our March 2 meeting and I'll have my colleague prepare his technical materials in advance.

Thanks so much,

Lauren

The Aluminum Association
Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Tuesday, February 06, 2018 9:25 AM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi Lauren,

Yes, we could accommodate a group of 8 attending this meeting.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA

Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Monday, February 05, 2018 2:52 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Re: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Thanks, Emily. I appreciate your help in getting this nailed down.

I would like to invite a few member company representatives to join, so I'm curious if there's a hard limit on number of attendees — would 6-8 (as a total group size) be workable?

Best,

Lauren

Lauren Wilk
The Aluminum Association
Office: (703) 358-2981

On Mon, Feb 5, 2018 at 2:38 PM -0500, "Atkinson, Emily" <Atkinson.Emily@epa.gov> wrote:

Hi Lauren,
You are confirmed for 45 minute meeting on Friday, March 2, 2018 at 3:00pm with Bill Wehrum.
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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager

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From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Monday, February 05, 2018 12:56 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Aluminum Association Meeting Request

Thanks, Emily. We'll take the meeting on March 2 at 3pm, and I'll firm up attendees on our end.

Let me know what details you need in advance of the meeting.

Much appreciated!

Lauren

The Aluminum Association
Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | Ex. 6 Personal Privacy (PP) | F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Monday, February 05, 2018 12:48 PM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Aluminum Association Meeting Request

Hi Lauren,

It looks like Bill Wehrum could be available for a 45 minute meeting on Friday, March 2, 2018 at 3:00pm.

Please advise if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Thursday, February 01, 2018 12:06 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Aluminum Association Meeting Request

Emily and Josh –

Will Lovett suggested I connect with you on scheduling a meeting with Assistant Administrator Wehrum for a few representatives of the aluminum industry. We have availability on the following dates: February 16, 20, 21, 23, 26, 27, 28 or March 1 (but we can certainly be flexible if an alternative date is necessary).

The Aluminum Association is active with EPA on a number of issues – and specifically, the members of our Aluminum Transportation Group (ATG) would very much like to hear directly from Mr. Wehrum about the Administration's priorities related to automotive GHG emissions and fuel economy regulations. The ATG represents the Association's member companies that produce aluminum for use in cars and trucks, including Alcoa, Arconic, Novelis, Rio Tinto and others.

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Thanks so much,

Lauren

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Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

Appointment

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 1/17/2018 6:41:08 PM
To: Grundler, Christopher [grundler.christopher@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Burch, Julia [Burch.Julia@epa.gov]; Charmley, William [charmley.william@epa.gov]; Moran, Robin [moran.robin@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Simon, Karl [Simon.Karl@epa.gov]
CC: Alson, Jeff [alson.jeff@epa.gov]

Subject: Meet with Toyota re: MidTerm Review (MTR) for autos/light duty trucks (Confirmed)
Attachments: RE: Meeting Requests for Toyota ; FW: Meeting Requests for Toyota from S. Fotis; Confirmed 12/15 at 3pm: Meeting Requests for Toyota from S. Fotis; Confirmed 1/23/18 at 10am: Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis
Location: WJC-N 5400 + Ex. 6 Personal Privacy (PP)

Start: 1/23/2018 3:00:00 PM
End: 1/23/2018 3:45:00 PM
Show Time As: Tentative

To: Bill Wehrum, Chris Grundler, Ben Hengst, Julia Burch, Bill Charmley, Robin Moran, Mike Olechiw and Karl Simon
Outside Attendees (in person): TBD

RE: Meeting Requests for Toy... | FW: Meeting Requests for Toy... | Confirmed 12/15 at 3pm: Meeting Re... | Confirmed 1/23/18 at 10am: Meetin...

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 12/11/2017 8:26:45 PM
To: Stephen Fotis [scf@vnf.com]
CC: Loving, Shanita [Loving.Shanita@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]
Subject: Confirmed 1/23/18 at 10am: Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis

Hi Stephen,

You are confirmed for a 45 minute in person meeting on Tuesday, January 23, 2018 at 10:00am EDT with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Monday, December 11, 2017 3:22 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: RE: Rescheduling Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis

Emily – I would like to confirm January 23, 2018 at 10:00am EDT for the Toyota meeting with Bill. I will shortly provide you with the names of individuals who will be participating in the meeting on behalf of Toyota.
Many thanks for your assistance!

Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

This communication may contain information and/or metadata that is legally privileged, confidential or exempt from disclosure. If you are not the intended recipient, please do not read or review the content and/or metadata and do not disseminate, distribute or copy this communication. Anyone who receives this message in error should notify the sender immediately by telephone (202-298-1800) or by return e-mail and delete it from his or her computer.

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Monday, December 11, 2017 3:00 PM
To: Stephen Fotis
Cc: Loving, Shanita; Lewis, Josh
Subject: RE: Rescheduling Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis

Hi Stephen,

Yes, Josh Lewis and I have coordinated on this to review scheduling options and January 23, 2018 at 10:00am EDT is the first available time to slot this meeting in for Bill Wehrum.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Monday, December 11, 2017 2:48 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: RE: Rescheduling Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis

Thanks Emily. In my conversations with Josh earlier today, we were talking about trying to schedule a Toyota meeting with Bill in early January, either at the end of the first week of January (January 4 or 5) or the following week (January 8-12). Before we schedule a meeting for the January 23, I want to confirm that there is no chance of scheduling a meeting during either of these two weeks.
Best,
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Monday, December 11, 2017 2:39 PM
To: Stephen Fotis
Cc: Loving, Shanita; Lewis, Josh
Subject: Rescheduling Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis

Hi Stephen,

It looks like the earliest date we could fit this in is for 45 minutes on Tuesday, January 23, 2018 at 10:00am EDT.

Please advise if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Friday, December 08, 2017 5:22 PM
To: Lewis, Josh <Lewis.Josh@epa.gov>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>; Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Confirmed 12/15 at 3pm: Meeting Requests for Toyota from S. Fotis

Thanks Josh for your email. I totally understand and very much appreciate your efforts to meet with Toyota. Please let me check with the client and will get back to you on Monday. Have a great weekend.
Best,
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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From: Lewis, Josh [mailto:Lewis.Josh@epa.gov]
Sent: Friday, December 08, 2017 2:14 PM
To: Stephen Fotis
Cc: Atkinson, Emily; Loving, Shanita
Subject: FW: Confirmed 12/15 at 3pm: Meeting Requests for Toyota from S. Fotis

Hi Stephen,

Bill now will be out of the office next Friday for work travel. We could keep the meeting for Friday (EPA participants would include a combination of the political team – Mandy Gunasekara/David Harlow/maybe others – along with career folks from OTAQ); or, if you want to reschedule with Bill, we'd be looking to early January to schedule. What is your preference?

Josh Lewis
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 564 2095
Ex. 6 Personal Privacy (PP)

From: Atkinson, Emily
Sent: Thursday, November 30, 2017 4:36 PM
To: Stephen Fotis <scf@vnf.com>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: Confirmed 12/15 at 3pm: Meeting Requests for Toyota from S. Fotis

Hi Stephen,

You are confirmed for a 45 minute in person meeting on Friday, December 15, 2017 at 3:00pm with Bill Wehrum.
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Emily

Emily Atkinson
Management Analyst/Office Manager

Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
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Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Thursday, November 30, 2017 4:27 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Meeting Requests for Toyota from S. Fotis

Emily - Friday, December 15, 2017 at 3:00 PM works for Toyota. I will get back to you shortly with the names and titles of those individuals who will be attending the meeting with Bill on behalf of Toyota.
Again, many thanks for all of your assistance here.
Have a great rest of the day.
Best,
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Thursday, November 30, 2017 3:43 PM
To: Stephen Fotis
Cc: Loving, Shanita
Subject: FW: Meeting Requests for Toyota from S. Fotis

Hi Stephen,

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Please advise if this could work on your end.

Thank you.
Emily

Emily Atkinson
Management Analyst/Office Manager
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Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Wednesday, November 29, 2017 12:37 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

Thank you Emily for your assistance.
Best,
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, November 29, 2017 11:51 AM
To: Stephen Fotis
Subject: RE: Meeting Requests for Toyota and Shell

Hi Stephen,

We are reviewing scheduling options now and will get back to you shortly.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Tuesday, November 28, 2017 5:32 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

Hi Emily – As suggested by Bill in his email below, I am following up with you regarding the scheduling of two separate meetings with Bill – one with Toyota on the Mid Term Review (MTR) for autos/light duty trucks, and the other with Shell on the OOOOa NSPS reconsideration rulemaking. Could you please advise me as to possible times that we might schedule these meetings? If possible, I'd like to try to schedule meetings for later this December before the holidays. Many thanks for your assistance.

Stephen

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From: Wehrum, Bill [mailto:Wehrum.Bill@epa.gov]
Sent: Monday, November 27, 2017 12:29 PM
To: Stephen Fotis
Cc: Atkinson, Emily
Subject: RE: Meeting Requests for Toyota and Shell

Thanks Stephen. I'm copying Emily Atkinson. She can work with you to find times.

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Monday, November 27, 2017 11:29 AM
To: Wehrum, Bill <Wehrum.Bill@epa.gov>; Wehrum, Bill <Wehrum.Bill@epa.gov>
Subject: Meeting Requests for Toyota and Shell

Bill – I hope that you had a good Thanksgiving and had some time to relax. As a follow-up to our discussions of last week, both Toyota and Shell are happy to accommodate your request and delay their meetings until later this December or early January. However, I would like to see if we can schedule the meeting time for each now given that your calendar will no doubt be filling up quickly and the issues both want to raise are time sensitive.
Would it be appropriate for me to follow-up with Shanita or someone else on scheduling meeting dates?
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From: Stephen Fotis
Sent: Wednesday, November 22, 2017 2:46 PM
To: wehrum.bill@epa.gov; wehrum.william@epa.gov
Subject: Follow-up to Your Message on Meeting Requests

Bill – Many thanks for your call last night regarding my two meeting requests. I am now checking with the client in each case but will most likely not be getting back to you with answer until after the Thanksgiving holiday. However, I would

be very surprised if there is anything compelling or urgent that would require scheduling either one of the meetings over the next few weeks.
Have a great Thanksgiving and I will be getting back to you next week.
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Stephen

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Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 11/30/2017 9:35:51 PM
To: Stephen Fotis [scf@vnf.com]
CC: Loving, Shanita [Loving.Shanita@epa.gov]
Subject: Confirmed 12/15 at 3pm: Meeting Requests for Toyota from S. Fotis

Hi Stephen,

You are confirmed for a 45 minute in person meeting on Friday, December 15, 2017 at 3:00pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.
Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Thursday, November 30, 2017 4:27 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Meeting Requests for Toyota from S. Fotis

Emily - Friday, December 15, 2017 at 3:00 PM works for Toyota. I will get back to you shortly with the names and titles of those individuals who will be attending the meeting with Bill on behalf of Toyota.
Again, many thanks for all of your assistance here.

Have a great rest of the day.
Best,
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Thursday, November 30, 2017 3:43 PM
To: Stephen Fotis
Cc: Loving, Shanita
Subject: FW: Meeting Requests for Toyota from S. Fotis

Hi Stephen,

It looks like Bill Wehrum could be available for a 45 minute in person meeting on Friday, December 15, 2017 at 3:00pm with Toyota.

Please advise if this could work on your end.

Thank you.
Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Wednesday, November 29, 2017 12:37 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

Thank you Emily for your assistance.
Best,
Stephen

Stephen Fotis
Partner
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(202) 298-1908

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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, November 29, 2017 11:51 AM
To: Stephen Fotis
Subject: RE: Meeting Requests for Toyota and Shell

Hi Stephen,

We are reviewing scheduling options now and will get back to you shortly.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Tuesday, November 28, 2017 5:32 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

Hi Emily – As suggested by Bill in his email below, I am following up with you regarding the scheduling of two separate meetings with Bill – one with Toyota on the Mid Term Review (MTR) for autos/light duty trucks, and the other with Shell on the OOOOa NSPS reconsideration rulemaking. Could you please advise me as to possible times that we might schedule these meetings? If possible, I'd like to try to schedule meetings for later this December before the holidays. Many thanks for your assistance.
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From: Wehrum, Bill [mailto:Wehrum.Bill@epa.gov]
Sent: Monday, November 27, 2017 12:29 PM
To: Stephen Fotis

Cc: Atkinson, Emily
Subject: RE: Meeting Requests for Toyota and Shell

Thanks Stephen. I'm copying Emily Atkinson. She can work with you to find times.

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Monday, November 27, 2017 11:29 AM
To: Wehrum, Bill <Wehrum.Bill@epa.gov>; Wehrum, Bill <Wehrum.Bill@epa.gov>
Subject: Meeting Requests for Toyota and Shell

Bill – I hope that you had a good Thanksgiving and had some time to relax. As a follow-up to our discussions of last week, both Toyota and Shell are happy to accommodate your request and delay their meetings until later this December or early January. However, I would like to see if we can schedule the meeting time for each now given that your calendar will no doubt be filling up quickly and the issues both want to raise are time sensitive.
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From: Stephen Fotis
Sent: Wednesday, November 22, 2017 2:46 PM
To: wehrum.bill@epa.gov; wehrum.william@epa.gov
Subject: Follow-up to Your Message on Meeting Requests

Bill – Many thanks for your call last night regarding my two meeting requests. I am now checking with the client in each case but will most likely not be getting back to you with answer until after the Thanksgiving holiday. However, I would be very surprised if there is anything compelling or urgent that would require scheduling either one of the meetings over the next few weeks.
Have a great Thanksgiving and I will be getting back to you next week.
Best,
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Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 11/30/2017 8:42:58 PM
To: scf@vnf.com
CC: Loving, Shanita [Loving.Shanita@epa.gov]
Subject: FW: Meeting Requests for Toyota from S. Fotis

Hi Stephen,

It looks like Bill Wehrum could be available for a 45 minute in person meeting on Friday, December 15, 2017 at 3:00pm with Toyota.

Please advise if this could work on your end.

Thank you.
Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
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Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Wednesday, November 29, 2017 12:37 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

Thank you Emily for your assistance.
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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, November 29, 2017 11:51 AM
To: Stephen Fotis
Subject: RE: Meeting Requests for Toyota and Shell

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Immediate Office of the Assistant Administrator
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Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Tuesday, November 28, 2017 5:32 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

Hi Emily – As suggested by Bill in his email below, I am following up with you regarding the scheduling of two separate meetings with Bill – one with Toyota on the Mid Term Review (MTR) for autos/light duty trucks, and the other with Shell on the OOOOa NSPS reconsideration rulemaking. Could you please advise me as to possible times that we might schedule these meetings? If possible, I'd like to try to schedule meetings for later this December before the holidays. Many thanks for your assistance.
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From: Wehrum, Bill [mailto:Wehrum.Bill@epa.gov]
Sent: Monday, November 27, 2017 12:29 PM
To: Stephen Fotis
Cc: Atkinson, Emily
Subject: RE: Meeting Requests for Toyota and Shell

Thanks Stephen. I'm copying Emily Atkinson. She can work with you to find times.

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Monday, November 27, 2017 11:29 AM
To: Wehrum, Bill <Wehrum.Bill@epa.gov>; Wehrum, Bill <Wehrum.Bill@epa.gov>
Subject: Meeting Requests for Toyota and Shell

Bill – I hope that you had a good Thanksgiving and had some time to relax. As a follow-up to our discussions of last week, both Toyota and Shell are happy to accommodate your request and delay their meetings until later this December

or early January. However, I would like to see if we can schedule the meeting time for each now given that your calendar will no doubt be filling up quickly and the issues both want to raise are time sensitive.
Would it be appropriate for me to follow-up with Shanita or someone else on scheduling meeting dates?
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From: Stephen Fotis
Sent: Wednesday, November 22, 2017 2:46 PM
To: wehrum.bill@epa.gov; wehrum.william@epa.gov
Subject: Follow-up to Your Message on Meeting Requests

Bill – Many thanks for your call last night regarding my two meeting requests. I am now checking with the client in each case but will most likely not be getting back to you with answer until after the Thanksgiving holiday. However, I would be very surprised if there is anything compelling or urgent that would require scheduling either one of the meetings over the next few weeks.
Have a great Thanksgiving and I will be getting back to you next week.
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Message

From: Hengst, Benjamin [Hengst.Benjamin@epa.gov]
Sent: 11/30/2017 8:32:26 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]
CC: Burch, Julia [Burch.Julia@epa.gov]
Subject: RE: Meeting Requests for Toyota

Yes, working on that now. I need to hear from some folks on whether a pre-brief is needed.

For now, you can add the following people. I may ask that you add more later.

Chris G
Ben H
Julia Burch
Bill Charmley

From: Atkinson, Emily
Sent: Thursday, November 30, 2017 3:17 PM
To: Hengst, Benjamin <Hengst.Benjamin@epa.gov>
Cc: Burch, Julia <Burch.Julia@epa.gov>
Subject: RE: Meeting Requests for Toyota

Thanks – let us know who to include in the Toyota meeting and if you all think Bill needs a prep meeting.

From: Hengst, Benjamin
Sent: Thursday, November 30, 2017 11:36 AM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Burch, Julia <Burch.Julia@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

Working on this one (Toyota). CC'ing Julia as she helps me staff the LD issues.

Thanks
Ben

From: Atkinson, Emily
Sent: Thursday, November 30, 2017 11:28 AM
To: Hengst, Benjamin <Hengst.Benjamin@epa.gov>; Krieger, Jackie <Krieger.Jackie@epa.gov>; Koerber, Mike <Koerber.Mike@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: FW: Meeting Requests for Toyota and Shell

Hi Ben, Jackie and Mike,

Bill has reviewed this request and agreed we will set up the two one hour meetings, as outlined below. Please advise if anyone from OAP, OAQPS, OGC and OTAQ should be included and whether or not a prep meeting is needed.

(1) Toyota on the Mid Term Review (MTR) for autos/light duty trucks
Prep – Y/N
OAP:
OAQPS:
OTAQ:

(2) Shell on the OOOOa NSPS reconsideration rulemaking
Prep – Y/N
OAP:
OAQPS:
OTAQ:

And for completeness, a note to the IO staff that Bill clarified these meeting do not require us to advise the requestor to bring four other groups in with them as we advise when the meeting is with former clients of Bill's.

I will wait to hear from you all before getting back to the requestor.

Thank you.
Emily

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Wednesday, November 29, 2017 12:37 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

Thank you Emily for your assistance.
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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, November 29, 2017 11:51 AM
To: Stephen Fotis
Subject: RE: Meeting Requests for Toyota and Shell

Hi Stephen,

We are reviewing scheduling options now and will get back to you shortly.

Emily Atkinson
Management Analyst/Office Manager

Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

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To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

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From: Wehrum, Bill [mailto:Wehrum.Bill@epa.gov]
Sent: Monday, November 27, 2017 12:29 PM
To: Stephen Fotis
Cc: Atkinson, Emily
Subject: RE: Meeting Requests for Toyota and Shell

Thanks Stephen. I'm copying Emily Atkinson. She can work with you to find times.

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Monday, November 27, 2017 11:29 AM
To: Wehrum, Bill <Wehrum.Bill@epa.gov>; Wehrum, Bill <Wehrum.Bill@epa.gov>
Subject: Meeting Requests for Toyota and Shell

Bill – I hope that you had a good Thanksgiving and had some time to relax. As a follow-up to our discussions of last week, both Toyota and Shell are happy to accommodate your request and delay their meetings until later this December or early January. However, I would like to see if we can schedule the meeting time for each now given that your calendar will no doubt be filling up quickly and the issues both want to raise are time sensitive.
Would it be appropriate for me to follow-up with Shanita or someone else on scheduling meeting dates?
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From: Stephen Fotis
Sent: Wednesday, November 22, 2017 2:46 PM
To: wehrum.bill@epa.gov; wehrum.william@epa.gov
Subject: Follow-up to Your Message on Meeting Requests

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Have a great Thanksgiving and I will be getting back to you next week.
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Message

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 1/29/2018 3:16:15 PM
To: Tucker, Jamie [jtucker@AKINGUMP.COM]
CC: Feeley, Drew (Robert) [Feeley.Drew@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]
Subject: RE: Confirmed 1/30 at 4pm: Meeting Request re: Natural Gas Vehicles

Thank you Jamie!

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Tucker, Jamie [mailto:jtucker@AKINGUMP.COM]
Sent: Monday, January 29, 2018 10:12 AM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Feeley, Drew (Robert) <Feeley.Drew@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: RE: Confirmed 1/30 at 4pm: Meeting Request re: Natural Gas Vehicles

Please find below the list of attendees for tomorrow afternoon and I've also enclosed for your use a one-pager providing a brief overview as well as separate one-pager describing the four proposed regulatory changes. Lastly, I've also enclosed a more in-depth presentation which we shared in December during a conversation with your team at OTAQ.

We are looking forward to meeting with Mr. Wehrum tomorrow and please let us know if you need any additional background in advance of the meetings.

Attending:
Robert Friedman, COO
Bob Atkinson, Chief Regulatory Officer
Larry Highbloom, Chief Administrative Officer

Susan Lent, Akin Gump
Jamie Tucker, Akin Gump

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, January 10, 2018 8:48 AM
To: Tucker, Jamie
Cc: Feeley, Drew (Robert); Lewis, Josh
Subject: Confirmed 1/30 at 4pm: Meeting Request re: Natural Gas Vehicles

Hi Jamie,
You are confirmed for a 45 minute meeting on Tuesday, January 30, 2018 at 4:00pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Tucker, Jamie [mailto:jtucker@AKINGUMP.COM]
Sent: Tuesday, January 09, 2018 3:02 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Feeley, Drew (Robert) <Feeley.Drew@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: RE: Meeting Request re: Natural Gas Vehicles

That's terrific and will work on our end. I will follow up shortly with a complete list of attendees on our part, but let's go ahead and book it.

Thanks.

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Tuesday, January 09, 2018 10:53 AM
To: Tucker, Jamie
Cc: Feeley, Drew (Robert); Lewis, Josh
Subject: FW: Meeting Request re: Natural Gas Vehicles

Hi Jamie,

It looks like Bill Wehrum could be available for a 45 minute meeting on Tuesday, January 30, 2018 at 4:00pm.

Please advise if this could work on your end.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Tucker, Jamie [mailto:jtucker@AKINGUMP.COM]
Sent: Wednesday, January 03, 2018 3:21 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Cc: Feeley, Drew (Robert) <Feeley.Drew@epa.gov>
Subject: Meeting Request re: Natural Gas Vehicles

Emily/Josh - On behalf of VNG.Co, a natural gas vehicle fueling infrastructure company, we wanted to see if Assistant Administrator Wehrum would be available this month to discuss a number of administrative and legislative policy changes the company is advocating to promote the adoption of natural gas vehicles largely by leveling the playing field with electric vehicles. We have had recent conversations with the Office of Policy as well as the Office of Transportation and Air Quality to discuss these proposals as well as with staff at the White House and Department of Transportation. With Mr. Wehrum's confirmation we would like to fold him into the conversation as well.

Natural gas vehicles provide a cost effective and additional pathway for automaker emissions compliance while preserving the products' consumer appeal, and are therefore worthy of being included in a portfolio of solutions along with EVs to achieve the objectives.

Among the key advantages of the proposed regulatory changes is the benefit to achieving emissions reductions in the light-duty truck category which accounts for 64% of new vehicle purchases (and are responsible for even greater amounts of fuel use and pollution if you take into account the differential in fuel economy between light-duty trucks and passenger cars), and for which there is not a viable electrification solution.

Specifically, we would encourage the Administration to consider:

- **Restoring the 0.15 "divisor"** in EPA's compliance calculations, equivalent to NHTSA's statutory Petroleum Equivalency Factor that counts a gallon-equivalent of natural gas as 0.15 gallons of gasoline. The previous Administration ended this powerful incentive while simultaneously providing electric vehicles with additional emissions incentives on the hope that EVs would be "game changers." The game has now changed for NGVs. The shale revolution that has occurred since the current rules were set as well the development of Renewable Natural Gas as the lowest carbon vehicle fuel are true game changers that strongly justify returning to the 0.15 divisor.

The powerful and well-justified incentive of the 0.15 divisor would be complemented and made even more effective by additional changes including:

- **Eliminating range requirements on bi-fuel NGVs** that results in an impractical natural gas tank size requirement that is twice the size of the gasoline tank and costly design requirements for NGVs, whereas no such range requirements exists for hybrid electric vehicles. This is the most important regulatory change as a complement to the 0.15 divisor of the three.

- **Providing NGV pick-ups with the bonus credits** provided to "strong electric hybrid pick-ups" and **eliminating the existing minimum 10% deployment threshold** to qualify for pickup bonus credits.

- **Establishing a new incentive to encourage retrofitting existing gasoline and diesel vehicles to run on natural gas**, something that isn't feasible for electric drives but which will reduce emissions by the existing fleet of vehicles

Enclosed for your further consideration are our Midterm Evaluation comments as well as information outlining the rationale for the recommended regulatory changes.

Thank you for your consideration.

Jamie

Jamie Tucker
AKIN GUMP STRAUSS HAUER & FELD LLP
1333 New Hampshire Avenue, N.W. | Washington, DC 20036-1564 | USA | Direct: +1 202.887.4279 | Internal: 24279
Fax: +1 202.887.4288 | jtucker@akingump.com | akingump.com | Bio

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The information contained in this e-mail message is intended only for the personal and confidential use of the recipient(s) named above. If you have received this communication in error, please notify us immediately by e-mail, and delete the original message.

Appointment

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 12/4/2017 6:03:40 PM
To: Grundler, Christopher [grundler.christopher@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Burch, Julia [Burch.Julia@epa.gov]; Charmley, William [charmley.william@epa.gov]; Moran, Robin [moran.robin@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Simon, Karl [simon.karl@epa.gov]

Subject: Meet with Toyota re: MidTerm Review (MTR) for autos/light duty trucks (Confirmed)
Attachments: RE: Meeting Requests for Toyota ; FW: Meeting Requests for Toyota from S. Fotis; Confirmed 12/15 at 3pm: Meeting Requests for Toyota from S. Fotis
Location: WJC-N 5400 **Ex. 6 Personal Privacy (PP)**

Start: 12/15/2017 8:00:00 PM
End: 12/15/2017 8:45:00 PM
Show Time As: Tentative

To: Bill Wehrum, Chris Grundler, Ben Hengst, Julia Burch, Bill Charmley, Robin Moran, Mike Olechiw and Karl Simon
Outside Attendees (in person): TBD

RE: Meeting Requests for Toy...
FW: Meeting Requests for Toy...
Confirmed 12/15 at 3pm: Meeting Re...

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 11/30/2017 9:35:51 PM
To: Stephen Fotis [scf@vnf.com]
CC: Loving, Shanita [Loving.Shanita@epa.gov]
Subject: Confirmed 12/15 at 3pm: Meeting Requests for Toyota from S. Fotis

Hi Stephen,

You are confirmed for a 45 minute in person meeting on Friday, December 15, 2017 at 3:00pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.
Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Thursday, November 30, 2017 4:27 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Meeting Requests for Toyota from S. Fotis

Emily - Friday, December 15, 2017 at 3:00 PM works for Toyota. I will get back to you shortly with the names and titles of those individuals who will be attending the meeting with Bill on behalf of Toyota.
Again, many thanks for all of your assistance here.

Have a great rest of the day.
Best,
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Thursday, November 30, 2017 3:43 PM
To: Stephen Fotis
Cc: Loving, Shanita
Subject: FW: Meeting Requests for Toyota from S. Fotis

Hi Stephen,

It looks like Bill Wehrum could be available for a 45 minute in person meeting on Friday, December 15, 2017 at 3:00pm with Toyota.

Please advise if this could work on your end.

Thank you.
Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Wednesday, November 29, 2017 12:37 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

Thank you Emily for your assistance.
Best,
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP

scf@vnf.com
(202) 298-1908

This communication may contain information and/or metadata that is legally privileged, confidential or exempt from disclosure. If you are not the intended recipient, please do not read or review the content and/or metadata and do not disseminate, distribute or copy this communication. Anyone who receives this message in error should notify the sender immediately by telephone (202-298-1800) or by return e-mail and delete it from his or her computer.

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, November 29, 2017 11:51 AM
To: Stephen Fotis
Subject: RE: Meeting Requests for Toyota and Shell

Hi Stephen,

We are reviewing scheduling options now and will get back to you shortly.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Tuesday, November 28, 2017 5:32 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

Hi Emily – As suggested by Bill in his email below, I am following up with you regarding the scheduling of two separate meetings with Bill – one with Toyota on the Mid Term Review (MTR) for autos/light duty trucks, and the other with Shell on the OOOOa NSPS reconsideration rulemaking. Could you please advise me as to possible times that we might schedule these meetings? If possible, I'd like to try to schedule meetings for later this December before the holidays. Many thanks for your assistance.
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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From: Wehrum, Bill [mailto:Wehrum.Bill@epa.gov]
Sent: Monday, November 27, 2017 12:29 PM
To: Stephen Fotis

Cc: Atkinson, Emily
Subject: RE: Meeting Requests for Toyota and Shell

Thanks Stephen. I'm copying Emily Atkinson. She can work with you to find times.

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Monday, November 27, 2017 11:29 AM
To: Wehrum, Bill <Wehrum.Bill@epa.gov>; Wehrum, Bill <Wehrum.Bill@epa.gov>
Subject: Meeting Requests for Toyota and Shell

Bill – I hope that you had a good Thanksgiving and had some time to relax. As a follow-up to our discussions of last week, both Toyota and Shell are happy to accommodate your request and delay their meetings until later this December or early January. However, I would like to see if we can schedule the meeting time for each now given that your calendar will no doubt be filling up quickly and the issues both want to raise are time sensitive.
Would it be appropriate for me to follow-up with Shanita or someone else on scheduling meeting dates?
Best,
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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From: Stephen Fotis
Sent: Wednesday, November 22, 2017 2:46 PM
To: wehrum.bill@epa.gov; wehrum.william@epa.gov
Subject: Follow-up to Your Message on Meeting Requests

Bill – Many thanks for your call last night regarding my two meeting requests. I am now checking with the client in each case but will most likely not be getting back to you with answer until after the Thanksgiving holiday. However, I would be very surprised if there is anything compelling or urgent that would require scheduling either one of the meetings over the next few weeks.
Have a great Thanksgiving and I will be getting back to you next week.
Best,
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 11/30/2017 8:42:58 PM
To: scf@vnf.com
CC: Loving, Shanita [Loving.Shanita@epa.gov]
Subject: FW: Meeting Requests for Toyota from S. Fotis

Hi Stephen,

It looks like Bill Wehrum could be available for a 45 minute in person meeting on Friday, December 15, 2017 at 3:00pm with Toyota.

Please advise if this could work on your end.

Thank you.
Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Wednesday, November 29, 2017 12:37 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

Thank you Emily for your assistance.
Best,
Stephen

Stephen Fotis
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Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, November 29, 2017 11:51 AM
To: Stephen Fotis
Subject: RE: Meeting Requests for Toyota and Shell

Hi Stephen,

We are reviewing scheduling options now and will get back to you shortly.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Tuesday, November 28, 2017 5:32 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

Hi Emily – As suggested by Bill in his email below, I am following up with you regarding the scheduling of two separate meetings with Bill – one with Toyota on the Mid Term Review (MTR) for autos/light duty trucks, and the other with Shell on the OOOOa NSPS reconsideration rulemaking. Could you please advise me as to possible times that we might schedule these meetings? If possible, I'd like to try to schedule meetings for later this December before the holidays. Many thanks for your assistance.
Stephen

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From: Wehrum, Bill [mailto:Wehrum.Bill@epa.gov]
Sent: Monday, November 27, 2017 12:29 PM
To: Stephen Fotis
Cc: Atkinson, Emily
Subject: RE: Meeting Requests for Toyota and Shell

Thanks Stephen. I'm copying Emily Atkinson. She can work with you to find times.

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Monday, November 27, 2017 11:29 AM
To: Wehrum, Bill <Wehrum.Bill@epa.gov>; Wehrum, Bill <Wehrum.Bill@epa.gov>
Subject: Meeting Requests for Toyota and Shell

Bill – I hope that you had a good Thanksgiving and had some time to relax. As a follow-up to our discussions of last week, both Toyota and Shell are happy to accommodate your request and delay their meetings until later this December

or early January. However, I would like to see if we can schedule the meeting time for each now given that your calendar will no doubt be filling up quickly and the issues both want to raise are time sensitive.
Would it be appropriate for me to follow-up with Shanita or someone else on scheduling meeting dates?
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Stephen

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From: Stephen Fotis
Sent: Wednesday, November 22, 2017 2:46 PM
To: wehrum.bill@epa.gov; wehrum.william@epa.gov
Subject: Follow-up to Your Message on Meeting Requests

Bill – Many thanks for your call last night regarding my two meeting requests. I am now checking with the client in each case but will most likely not be getting back to you with answer until after the Thanksgiving holiday. However, I would be very surprised if there is anything compelling or urgent that would require scheduling either one of the meetings over the next few weeks.
Have a great Thanksgiving and I will be getting back to you next week.
Best,
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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Appointment

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 11/22/2017 1:51:40 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Harlow, David [harlow.david@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Sutton, Tia [sutton.tia@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Charmley, William [charmley.william@epa.gov]; Moran, Robin [moran.robin@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]

Subject: Meet with National Coalition for Advanced Transportation (NCAT) (Confirmed)
Attachments: Confirmed 12/13 at 4pm: Request for Meeting; RE: Request for Meeting
Location: WJC-N 5400 + Video with Ex. 6 Personal Privacy (PP)

Start: 12/13/2017 9:00:00 PM
End: 12/13/2017 9:45:00 PM
Show Time As: Tentative

To: Bill Wehrum, Mandy Gunasekara, David Harlow, Alex Dominguez, Ben Hengst, Tia Sutton, Chris Grundler, Bill Charmley, Robin Moran, and Mike Olechiw
Outside Attendees (in person): TBD

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 11/22/2017 1:49:21 PM
To: Robert.Wyman@LW.com
CC: Loving, Shanita [Loving.Shanita@epa.gov]
Subject: Confirmed 12/13 at 4pm: Request for Meeting

Hi Bob,

You are confirmed for a 45 minute in person meeting on Wednesday, December 13, 2017 at 4:00pm with Bill Wehrum.

Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.

Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Acting Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

-----Original Message-----
From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Tuesday, November 21, 2017 4:57 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Request for Meeting

Yes, definitely. Thank you.

From: Atkinson, Emily <Atkinson.Emily@epa.gov>
Sent: Tuesday, November 21, 2017 1:48:14 PM
To: Wyman, Robert (LA)
Cc: Loving, Shanita
Subject: RE: Request for Meeting

Hi Bob,

It looks like Bill Wehrum could be available for a 45 minute in person meeting on Wednesday, December 13, 2017 at 4:00pm.

Please advise if this could work on your end.

Thank you.
Emily

Emily Atkinson
Management Analyst/Office Manager

Immediate Office of the Acting Assistant Administrator Office of Air and Radiation, USEPA Room 5412B, 1200 Pennsylvania Avenue NW Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Friday, November 17, 2017 6:03 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Request for Meeting

Emily - thank you for speaking with me by telephone earlier today. I am writing to request a meeting with Bill Wehrum on the subject of the midterm evaluation and the national greenhouse gas emissions standards for motor vehicles. I make this request on behalf of the National Coalition for Advanced Transportation (NCAT).

NCAT is a coalition of leading companies that support electric vehicle and other advanced transportation technologies and related infrastructure, including through: energy supply, transmission and distribution; vehicle and component design and manufacturing; charging infrastructure, battery and other energy-storage technology design, production and implementation; infrastructure engineering and construction; and the movement of passengers, goods and services; among other activities. Prior to our meeting, I will provide a list of NCAT attendees.

If possible, we would like to meet with Mr. Wehrum and appropriate staff, as he determines, on Wednesday, December 13, at any time. Of course, we recognize that his schedule may not permit meeting on this date, in which case we will do our best to accommodate whatever date he selects.

Sincere thanks.

Bob

Robert A. Wyman, Jr.
LATHAM & WATKINS LLP
Email: robert.wyman@lw.com<mailto:robert.wyman@lw.com>

355 South Grand Avenue
Los Angeles, CA 90071-1560
Direct: +1.213.891.8346

555 Eleventh Street, NW
Washington, DC 20004-1304
Direct: +1.202.654.7119

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Latham & Watkins LLP or any of its affiliates may monitor electronic communications sent or received by our networks in order to protect our business and verify compliance with our policies and relevant legal requirements.

Latham & Watkins LLP

Message

From: Hengst, Benjamin [Hengst.Benjamin@epa.gov]
Sent: 11/21/2017 10:07:15 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]; Sutton, Tia [sutton.tia@epa.gov]
CC: Lewis, Josh [Lewis.Josh@epa.gov]
Subject: RE: Request for Meeting

Thanks. Please add Bill Charmley, Robin Moran, and Mike Olechiw to the invite.

I don't think a pre-brief will be needed but I can ask the team to put a backgrounder together that we can send in advance.

Ben

From: Atkinson, Emily
Sent: Tuesday, November 21, 2017 4:50 PM
To: Hengst, Benjamin <Hengst.Benjamin@epa.gov>; Sutton, Tia <sutton.tia@epa.gov>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: FW: Request for Meeting

Hi Ben and Tia,

Checking in on this meeting . . . . Bill has said he will do it and I've put a tentative hold on for 12/13 at 4pm. Please advise who should be included on the invite – right now I just have you two and Chris + the OAR political team.

And let me know if you want time for a prep meeting with Bill.

Thanks.
Emily

From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Friday, November 17, 2017 6:03 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Request for Meeting

Emily – thank you for speaking with me by telephone earlier today. I am writing to request a meeting with Bill Wehrum on the subject of the midterm evaluation and the national greenhouse gas emissions standards for motor vehicles. I make this request on behalf of the ***National Coalition for Advanced Transportation (NCAT)***.

NCAT is a coalition of leading companies that support electric vehicle and other advanced transportation technologies and related infrastructure, including through: energy supply, transmission and distribution; vehicle and component design and manufacturing; charging infrastructure, battery and other energy-storage technology design, production and implementation; infrastructure engineering and construction; and the movement of passengers, goods and services; among other activities. Prior to our meeting, I will provide a list of ***NCAT*** attendees.

If possible, we would like to meet with Mr. Wehrum and appropriate staff, as he determines, on Wednesday, December 13, at any time. Of course, we recognize that his schedule may not permit meeting on this date, in which case we will do our best to accommodate whatever date he selects.

Sincere thanks.

Bob

Robert A. Wyman, Jr.
LATHAM & WATKINS LLP
Email: robert.wyman@lw.com

355 South Grand Avenue
Los Angeles, CA 90071-1560
Direct: +1.213.891.8346

555 Eleventh Street, NW
Washington, DC 20004-1304
Direct: +1.202.654.7119

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Appointment

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 11/22/2017 1:50:12 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Harlow, David [harlow.david@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Sutton, Tia [sutton.tia@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]

Subject: Meet with National Coalition for Advanced Transportation (NCAT) (Confirmed)
Attachments: Confirmed 12/13 at 4pm: Request for Meeting
Location: WJC-N 5400

Start: 12/13/2017 9:00:00 PM
End: 12/13/2017 9:45:00 PM
Show Time As: Tentative

To: Bill Wehrum, Mandy Gunasekara, David Harlow, Alex Dominguez, Ben Hengst, Tia Sutton, Chris Grundler
Outside Attendees (in person): TBD

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 11/22/2017 1:49:21 PM
To: Robert.Wyman@LW.com
CC: Loving, Shanita [Loving.Shanita@epa.gov]
Subject: Confirmed 12/13 at 4pm: Request for Meeting

Hi Bob,

You are confirmed for a 45 minute in person meeting on Wednesday, December 13, 2017 at 4:00pm with Bill Wehrum.

Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.

Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Acting Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

-----Original Message-----
From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Tuesday, November 21, 2017 4:57 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Request for Meeting

Yes, definitely. Thank you.

From: Atkinson, Emily <Atkinson.Emily@epa.gov>
Sent: Tuesday, November 21, 2017 1:48:14 PM
To: Wyman, Robert (LA)
Cc: Loving, Shanita
Subject: RE: Request for Meeting

Hi Bob,

It looks like Bill Wehrum could be available for a 45 minute in person meeting on Wednesday, December 13, 2017 at 4:00pm.

Please advise if this could work on your end.

Thank you.
Emily

Emily Atkinson
Management Analyst/Office Manager

Immediate Office of the Acting Assistant Administrator Office of Air and Radiation, USEPA Room 5412B, 1200 Pennsylvania Avenue NW Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Friday, November 17, 2017 6:03 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Request for Meeting

Emily - thank you for speaking with me by telephone earlier today. I am writing to request a meeting with Bill Wehrum on the subject of the midterm evaluation and the national greenhouse gas emissions standards for motor vehicles. I make this request on behalf of the National Coalition for Advanced Transportation (NCAT).

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If possible, we would like to meet with Mr. Wehrum and appropriate staff, as he determines, on Wednesday, December 13, at any time. Of course, we recognize that his schedule may not permit meeting on this date, in which case we will do our best to accommodate whatever date he selects.

Sincere thanks.

Bob

Robert A. Wyman, Jr.
LATHAM & WATKINS LLP
Email: robert.wyman@lw.com<mailto:robert.wyman@lw.com>

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Latham & Watkins LLP

Appointment

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 2/7/2018 8:02:39 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Cook, Leila [cook.leila@epa.gov]; Charmley, William [charmley.william@epa.gov]
CC: Moran, Robin [moran.robin@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Caffrey, Cheryl [caffrey.cheryl@epa.gov]

Subject: Meet with Aluminum Association - Aluminum Transport Group Members (Confirmed)
Attachments: Aluminum Association Meeting Request; Confirmed 3/2 at 3pm: Aluminum Association Meeting Request; Confirmed 3/1 at 4pm: Aluminum Association Meeting Request
Location: WJC-N 5400 + Video with AA

Start: 3/1/2018 9:00:00 PM
End: 3/1/2018 9:45:00 PM
Show Time As: Tentative

Re: automotive GHG emissions and fuel economy regulations
To: Bill Wehrum, Mandy Gunasekara, Chris Grundler, Ben Hengst, Lee Cook, Bill Charmley
Outside Attendees (in person): TBD

Aluminum Association Meet... | Confirmed 3/2 at 3pm: Aluminum ... | Confirmed 3/1 at 4pm: Aluminum ...

Message

From: Lauren Wilk [lwilk@aluminum.org]
Sent: 2/1/2018 5:05:48 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]
Subject: Aluminum Association Meeting Request

Emily and Josh --

Will Lovett suggested I connect with you on scheduling a meeting with Assistant Administrator Wehrum for a few representatives of the aluminum industry. We have availability on the following dates: February 16, 20, 21, 23, 26, 27, 28 or March 1 (but we can certainly be flexible if an alternative date is necessary).

The Aluminum Association is active with EPA on a number of issues -- and specifically, the members of our Aluminum Transportation Group (ATG) would very much like to hear directly from Mr. Wehrum about the Administration's priorities related to automotive GHG emissions and fuel economy regulations. The ATG represents the Association's member companies that produce aluminum for use in cars and trucks, including Alcoa, Arconic, Novelis, Rio Tinto and others.

The aluminum industry plays a significant role in the automotive supply chain, and the pounds of aluminum content per vehicle has grown by more than 30 percent over the past decade. Driven by that auto sector growth, the aluminum industry has announced or completed U.S. plant expansions and investments of more than $2.6 billion since 2013. Already this year, Novelis announced that it was investing $300 million in a new greenfield automotive finishing facility in Guthrie, Kentucky. The industry is acutely interested in the outcome of the midterm review on vehicle fuel economy, and we have met previously with the White House, OMB, NHTSA, CARB and others on this topic.

I'd be happy to answer any questions or provide additional background, if that's helpful.

Thanks so much,

Lauren

The Aluminum Association

Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/7/2018 8:01:58 PM
To: Lauren Wilk [lwilk@aluminum.org]
Subject: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request

Hi Lauren,
You are confirmed for 45 minute meeting on Thursday, March 1, 2018 at 4:00pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Wednesday, February 07, 2018 2:59 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Thanks so much, Emily. That's perfect.

I'll circle back, closer to the meeting, with a list of attendees. Let me know if you need anything else in the meantime.

Lauren

Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, February 07, 2018 12:33 PM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi Lauren,

It looks like we could fit this in on Thursday, March 1 at 4:00pm. Let me know if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Wednesday, February 07, 2018 11:01 AM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi, Emily. One of the technical experts I was hoping to bring in for our meeting with Mr. Wehrum will unfortunately be out of the country on Friday 3/2. Is there any chance that Mr. Wehrum would be available to meet on Thursday 3/1, or sometime March 12-16? If not, we'll keep our March 2 meeting and I'll have my colleague prepare his technical materials in advance.

Thanks so much,

Lauren

Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202

T 703.358.2981 | Ex. 6 Personal Privacy (PP) | F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Tuesday, February 06, 2018 9:25 AM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi Lauren,

Yes, we could accommodate a group of 8 attending this meeting.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Monday, February 05, 2018 2:52 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Re: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Thanks, Emily. I appreciate your help in getting this nailed down.

I would like to invite a few member company representatives to join, so I'm curious if there's a hard limit on number of attendees — would 6-8 (as a total group size) be workable?

Best,

Lauren

Lauren Wilk
The Aluminum Association
Office: (703) 358-2981

On Mon, Feb 5, 2018 at 2:38 PM -0500, "Atkinson, Emily" <Atkinson.Emily@epa.gov> wrote:

> Hi Lauren,
> You are confirmed for 45 minute meeting on Friday, March 2, 2018 at 3:00pm with Bill Wehrum.
> Directions and procedures to 1200 Pennsylvania Avenue NW:
>
> > Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Monday, February 05, 2018 12:56 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Aluminum Association Meeting Request

Thanks, Emily. We'll take the meeting on March 2 at 3pm, and I'll firm up attendees on our end.

Let me know what details you need in advance of the meeting.

Much appreciated!

Lauren

The Aluminum Association
Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Monday, February 05, 2018 12:48 PM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Aluminum Association Meeting Request

Hi Lauren,

It looks like Bill Wehrum could be available for a 45 minute meeting on Friday, March 2, 2018 at 3:00pm.

Please advise if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Thursday, February 01, 2018 12:06 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Aluminum Association Meeting Request

Emily and Josh –

Will Lovett suggested I connect with you on scheduling a meeting with Assistant Administrator Wehrum for a few representatives of the aluminum industry. We have availability on the following dates: February 16, 20, 21, 23, 26, 27, 28 or March 1 (but we can certainly be flexible if an alternative date is necessary).

The Aluminum Association is active with EPA on a number of issues – and specifically, the members of our Aluminum Transportation Group (ATG) would very much like to hear directly from Mr. Wehrum about the Administration's priorities related to automotive GHG emissions and fuel economy regulations. The ATG represents the Association's member companies that produce aluminum for use in cars and trucks, including Alcoa, Arconic, Novelis, Rio Tinto and others.

The aluminum industry plays a significant role in the automotive supply chain, and the pounds of aluminum content per vehicle has grown by more than 30 percent over the past decade. Driven by that auto sector growth, the aluminum industry has announced or completed U.S. plant expansions and investments of more than $2.6 billion since 2013. Already this year, Novelis announced that it was investing $300 million in a new greenfield automotive finishing facility in Guthrie, Kentucky. The industry is acutely interested in the outcome of the midterm review on vehicle fuel economy, and we have met previously with the White House, OMB, NHTSA, CARB and others on this topic.

I'd be happy to answer any questions or provide additional background, if that's helpful.

Thanks so much,

Lauren

The Aluminum Association
Lauren Wilk
Vice President, Policy & International Trade

The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/5/2018 7:38:19 PM
To: Lauren Wilk [lwilk@aluminum.org]
Subject: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi Lauren,
You are confirmed for 45 minute meeting on Friday, March 2, 2018 at 3:00pm with Bill Wehrum.
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Emily

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Email: atkinson.emily@epa.gov

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Sent: Monday, February 05, 2018 12:56 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
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Much appreciated!

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Arlington, VA 22202
T 703.358.2981 Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Monday, February 05, 2018 12:48 PM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Aluminum Association Meeting Request

Hi Lauren,

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Please advise if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Thursday, February 01, 2018 12:06 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Aluminum Association Meeting Request

Emily and Josh –

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The aluminum industry plays a significant role in the automotive supply chain, and the pounds of aluminum content per vehicle has grown by more than 30 percent over the past decade. Driven by that auto sector growth, the aluminum industry has announced or completed U.S. plant expansions and investments of more than $2.6 billion since 2013. Already this year, Novelis announced that it was investing $300 million in a new greenfield automotive finishing facility in Guthrie, Kentucky. The industry is acutely interested in the outcome of the midterm review on vehicle fuel economy, and we have met previously with the White House, OMB, NHTSA, CARB and others on this topic.

I'd be happy to answer any questions or provide additional background, if that's helpful.

Thanks so much,

Lauren

The Aluminum Association

Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | Ex. 6 Personal Privacy (PP) | F 703.358.2961
JOIN THE CONVERSATION:

Message

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 2/1/2018 2:41:23 PM
To: Laurie Holmes [lholmes@mema.org]
CC: Lewis, Josh [Lewis.Josh@epa.gov]
Subject: RE: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Thanks Laurie!

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Thursday, February 01, 2018 9:38 AM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Emily,
As requested, below is a list of participants for the meeting with Mr. Wehrum at 4:15 on Monday, February 5.
Thank you so much for your assistance in setting up this meeting.

Attendees:

1. Laurie Holmes, MEMA
2. Catherine Boland, MEMA
3. Dave Cetola, Johnson Matthey
4. Greg Garr, Umicore
5. Mike Belwood, Arconic
6. Joseph Fengler, Honeywell
7. Jennifer Heckmann, DENSO
8. Ana Meuweissen, Bosch
9. Erika Nielson, BW
10. Andrew Kenny, Magna

Best,
Laurie

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Thursday, January 18, 2018 3:44 PM
To: Laurie Holmes <lholmes@mema.org>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>

Subject: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Laurie,
You are confirmed for a 45 minute in person meeting on Monday, February 5, 2018 at 4:15pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.

Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information. And based on the size of the room we plan to use, you should plan to bring no more than 10 attendees to this meeting.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Thursday, January 18, 2018 3:08 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Emily,
Yes, Mon. Feb. 5 at 4:15 will work for us.

Is there a number limit for the room? We will have some members with us.

Best,
Laurie

Sent from my iPhone

On Jan 18, 2018, at 11:08 AM, Atkinson, Emily <Atkinson.Emily@epa.gov> wrote:

Hi Laurie,

It looks like Bill Wehrum could be available for a 45 minute in person meeting on Monday, February 5 at 4:15pm.

Please advise if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Wednesday, January 17, 2018 10:34 AM
To: Lewis, Josh <Lewis.Josh@epa.gov>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Josh,
In addition to the week of the 29th we could also do Monday, February 5 or Tuesday, February 6 before 1.
Let me know if you need additional date ranges to work with.
Best,
Laurie

From: Lewis, Josh [mailto:Lewis.Josh@epa.gov]
Sent: Friday, January 12, 2018 2:16 PM
To: Laurie Holmes <lholmes@mema.org>; Catherine Boland <cboland@MEMA.ORG>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: FW: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

+ Emily and – Bill.

Is there a rough date or dates you were looking to come in?

Josh Lewis
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 564 2095

Ex. 6 Personal Privacy (PP)

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Friday, January 12, 2018 10:56 AM
To: Wehrum, Bill <Wehrum.Bill@epa.gov>
Cc: Catherine Boland <cboland@MEMA.ORG>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Bill, Thank you so much.
Josh, Look forward to hearing from you.

From: Wehrum, Bill [mailto:Wehrum.Bill@epa.gov]
Sent: Friday, January 12, 2018 7:38 AM
To: Laurie Holmes <lholmes@mema.org>
Cc: Catherine Boland <cboland@MEMA.ORG>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Re: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Laurie. I'd be happy to talk with you. I've copied my chief of staff, Josh Lewis, who can help coordinate.

_____
Bill Wehrum
Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency
(202) 564-7404

On Jan 11, 2018, at 1:33 PM, Laurie Holmes <lholmes@mema.org> wrote:

> Bill:
> MEMA would like to request a meeting to discuss the midterm evaluation on the vehicle greenhouse gas emission standards.
>
> MEMA represents more than 1,000 companies that manufacture components, systems and materials for motor vehicles and represents the largest sector of manufacturing jobs in the U.S. Since auto suppliers play a major role in developing the technologies necessary for vehicle emission reduction, suppliers have a strong interest in the midterm evaluation and the standards. Our position is also not identical to the vehicle manufactures on the issue.
>
> It would be helpful if we could discuss with you the impact the program has had and will have on our industry.
>
> Look forward to hearing from you.
>
> Laurie Holmes
> Senior Director, Environmental Policy
> Motor & Equipment Manufacturers Association
> 1030 15th Street NW, Suite 500 East
> Washington, DC 20005
> Direct: 202-312-9247
> **Ex. 6 Personal Privacy (PP)**
> <image001.png>

April 10-11 | Washington, DC
www.mema.org/dcsummit

Message

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 11/22/2017 1:49:21 PM
To: ROBERT.WYMAN@lw.com
CC: Loving, Shanita [Loving.Shanita@epa.gov]
BCC: Atkinson, Emily [Atkinson.Emily@epa.gov]
Subject: Confirmed 12/13 at 4pm: Request for Meeting

Hi Bob,

You are confirmed for a 45 minute in person meeting on Wednesday, December 13, 2017 at 4:00pm with Bill Wehrum.

Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Acting Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

-----Original Message-----
From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Tuesday, November 21, 2017 4:57 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Request for Meeting

Yes, definitely. Thank you.

From: Atkinson, Emily <Atkinson.Emily@epa.gov>
Sent: Tuesday, November 21, 2017 1:48:14 PM
To: Wyman, Robert (LA)
Cc: Loving, Shanita
Subject: RE: Request for Meeting

Hi Bob,

It looks like Bill Wehrum could be available for a 45 minute in person meeting on Wednesday, December 13, 2017 at 4:00pm.

Please advise if this could work on your end.

Thank you.
Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Acting Assistant Administrator Office of Air and Radiation, USEPA Room 5412B, 1200 Pennsylvania Avenue NW Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Friday, November 17, 2017 6:03 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Request for Meeting

Emily - thank you for speaking with me by telephone earlier today. I am writing to request a meeting with Bill Wehrum on the subject of the midterm evaluation and the national greenhouse gas emissions standards for motor vehicles. I make this request on behalf of the National Coalition for Advanced Transportation (NCAT).

NCAT is a coalition of leading companies that support electric vehicle and other advanced transportation technologies and related infrastructure, including through: energy supply, transmission and distribution; vehicle and component design and manufacturing; charging infrastructure, battery and other energy-storage technology design, production and implementation; infrastructure engineering and construction; and the movement of passengers, goods and services; among other activities. Prior to our meeting, I will provide a list of NCAT attendees.

If possible, we would like to meet with Mr. Wehrum and appropriate staff, as he determines, on Wednesday, December 13, at any time. Of course, we recognize that his schedule may not permit meeting on this date, in which case we will do our best to accommodate whatever date he selects.

Sincere thanks.

Bob

Robert A. Wyman, Jr.
LATHAM & WATKINS LLP
Email: robert.wyman@lw.com<mailto:robert.wyman@lw.com>

355 South Grand Avenue
Los Angeles, CA 90071-1560
Direct: +1.213.891.8346

555 Eleventh Street, NW
Washington, DC 20004-1304
Direct: +1.202.654.7119

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Latham & Watkins LLP or any of its affiliates may monitor electronic communications sent or received by our networks in order to protect our business and verify compliance with our policies and relevant legal requirements.

Latham & Watkins LLP

Message

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 2/7/2018 8:01:58 PM
To: Lauren Wilk [lwilk@aluminum.org]
BCC: Atkinson, Emily [Atkinson.Emily@epa.gov]
Subject: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request

Hi Lauren,
You are confirmed for 45 minute meeting on Thursday, March 1, 2018 at 4:00pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Wednesday, February 07, 2018 2:59 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Thanks so much, Emily. That's perfect.

I'll circle back, closer to the meeting, with a list of attendees. Let me know if you need anything else in the meantime.

Lauren

Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, February 07, 2018 12:33 PM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi Lauren,

It looks like we could fit this in on Thursday, March 1 at 4:00pm. Let me know if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Wednesday, February 07, 2018 11:01 AM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi, Emily. One of the technical experts I was hoping to bring in for our meeting with Mr. Wehrum will unfortunately be out of the country on Friday 3/2. Is there any chance that Mr. Wehrum would be available to meet on Thursday 3/1, or sometime March 12-16? If not, we'll keep our March 2 meeting and I'll have my colleague prepare his technical materials in advance.

Thanks so much,

Lauren

Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association

1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | Ex. 6 Personal Privacy (PP) | F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Tuesday, February 06, 2018 9:25 AM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi Lauren,

Yes, we could accommodate a group of 8 attending this meeting.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Monday, February 05, 2018 2:52 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Re: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Thanks, Emily. I appreciate your help in getting this nailed down.

I would like to invite a few member company representatives to join, so I'm curious if there's a hard limit on number of attendees — would 6-8 (as a total group size) be workable?

Best,

Lauren

Lauren Wilk
The Aluminum Association
Office: (703) 358-2981

On Mon, Feb 5, 2018 at 2:38 PM -0500, "Atkinson, Emily" <Atkinson.Emily@epa.gov> wrote:

> Hi Lauren,
> You are confirmed for 45 minute meeting on Friday, March 2, 2018 at 3:00pm with Bill Wehrum.
> Directions and procedures to 1200 Pennsylvania Avenue NW:
>
> > Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Monday, February 05, 2018 12:56 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Aluminum Association Meeting Request

Thanks, Emily. We'll take the meeting on March 2 at 3pm, and I'll firm up attendees on our end.

Let me know what details you need in advance of the meeting.

Much appreciated!

Lauren

The Aluminum Association
Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Monday, February 05, 2018 12:48 PM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Aluminum Association Meeting Request

Hi Lauren,

It looks like Bill Wehrum could be available for a 45 minute meeting on Friday, March 2, 2018 at 3:00pm.

Please advise if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Thursday, February 01, 2018 12:06 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Aluminum Association Meeting Request

Emily and Josh –

Will Lovett suggested I connect with you on scheduling a meeting with Assistant Administrator Wehrum for a few representatives of the aluminum industry. We have availability on the following dates: February 16, 20, 21, 23, 26, 27, 28 or March 1 (but we can certainly be flexible if an alternative date is necessary).

The Aluminum Association is active with EPA on a number of issues – and specifically, the members of our Aluminum Transportation Group (ATG) would very much like to hear directly from Mr. Wehrum about the Administration's priorities related to automotive GHG emissions and fuel economy regulations. The ATG represents the Association's member companies that produce aluminum for use in cars and trucks, including Alcoa, Arconic, Novelis, Rio Tinto and others.

The aluminum industry plays a significant role in the automotive supply chain, and the pounds of aluminum content per vehicle has grown by more than 30 percent over the past decade. Driven by that auto sector growth, the aluminum industry has announced or completed U.S. plant expansions and investments of more than $2.6 billion since 2013. Already this year, Novelis announced that it was investing $300 million in a new greenfield automotive finishing facility in Guthrie, Kentucky. The industry is acutely interested in the outcome of the midterm review on vehicle fuel economy, and we have met previously with the White House, OMB, NHTSA, CARB and others on this topic.

I'd be happy to answer any questions or provide additional background, if that's helpful.

Thanks so much,

Lauren

The Aluminum Association
Lauren Wilk
Vice President, Policy & International Trade

The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

Appointment

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 2/1/2018 2:41:11 PM
To: Grundler, Christopher [grundler.christopher@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Charmley, William [charmley.william@epa.gov]; Simon, Karl [Simon.Karl@epa.gov]; Moran, Robin [moran.robin@epa.gov]

Subject: Meet with Motor & Equipment Manufacturers Association (Confirmed)
Attachments: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards ; Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards
Location: WJC-N 5400 + Video with AA

Start: 2/5/2018 9:15:00 PM
End: 2/5/2018 10:00:00 PM
Show Time As: Tentative

Re: Midterm Evaluation for Vehicle GHG Standards
To: Bill Wehrum, Chris Grundler, Ben Hengst
Cc: Mandy Gunasekara
Outside Attendees (in person):

1. Laurie Holmes, MEMA
2. Catherine Boland, MEMA
3. Dave Cetola, Johnson Matthey
4. Greg Garr, Umicore
5. Mike Belwood, Arconic
6. Joseph Fengler, Honeywell
7. Jennifer Heckmann, DENSO
8. Ana Meuweissen, Bosch
9. Erika Nielson, BW
10. Andrew Kenny, Magna

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 1/18/2018 8:44:24 PM
To: Laurie Holmes [lholmes@mema.org]
CC: Lewis, Josh [Lewis.Josh@epa.gov]
Subject: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Laurie,
You are confirmed for a 45 minute in person meeting on Monday, February 5, 2018 at 4:15pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information. And based on the size of the room we plan to use, you should plan to bring no more than 10 attendees to this meeting.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Thursday, January 18, 2018 3:08 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Emily,
Yes, Mon. Feb. 5 at 4:15 will work for us.

Is there a number limit for the room? We will have some members with us.

Best,
Laurie

Sent from my iPhone

On Jan 18, 2018, at 11:08 AM, Atkinson, Emily <Atkinson.Emily@epa.gov> wrote:

Hi Laurie,

It looks like Bill Wehrum could be available for a 45 minute in person meeting on Monday, February 5 at 4:15pm.

Please advise if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Wednesday, January 17, 2018 10:34 AM
To: Lewis, Josh <Lewis.Josh@epa.gov>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Josh,
In addition to the week of the 29th we could also do Monday, February 5 or Tuesday, February 6 before 1.
Let me know if you need additional date ranges to work with.
Best,
Laurie

From: Lewis, Josh [mailto:Lewis.Josh@epa.gov]
Sent: Friday, January 12, 2018 2:16 PM
To: Laurie Holmes <lholmes@mema.org>; Catherine Boland <cboland@MEMA.ORG>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: FW: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

+ Emily and – Bill.

Is there a rough date or dates you were looking to come in?

Josh Lewis
Chief of Staff

EPA/Office of Air and Radiation
Office: 202 564 2095
Ex. 6 Personal Privacy (PP)

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Friday, January 12, 2018 10:56 AM
To: Wehrum, Bill <Wehrum.Bill@epa.gov>
Cc: Catherine Boland <cboland@MEMA.ORG>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Bill, Thank you so much.
Josh, Look forward to hearing from you.

From: Wehrum, Bill [mailto:Wehrum.Bill@epa.gov]
Sent: Friday, January 12, 2018 7:38 AM
To: Laurie Holmes <lholmes@mema.org>
Cc: Catherine Boland <cboland@MEMA.ORG>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Re: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Laurie. I'd be happy to talk with you. I've copied my chief of staff, Josh Lewis, who can help coordinate.

_____
Bill Wehrum
Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency
(202) 564-7404

On Jan 11, 2018, at 1:33 PM, Laurie Holmes <lholmes@mema.org> wrote:

> Bill:
> MEMA would like to request a meeting to discuss the midterm evaluation on the vehicle greenhouse gas emission standards.
>
> MEMA represents more than 1,000 companies that manufacture components, systems and materials for motor vehicles and represents the largest sector of manufacturing jobs in the U.S. Since auto suppliers play a major role in developing the technologies necessary for vehicle emission reduction, suppliers have a strong interest in the midterm evaluation and the standards. Our position is also not identical to the vehicle manufactures on the issue.
>
> It would be helpful if we could discuss with you the impact the program has had and will have on our industry.
>
> Look forward to hearing from you.
>
> Laurie Holmes
> Senior Director, Environmental Policy
> Motor & Equipment Manufacturers Association
> 1030 15th Street NW, Suite 500 East

Washington, DC 20005
Direct: 202-312-9247
Ex. 6 Personal Privacy (PP)
<image001.png>
April 10-11 | Washington, DC
www.mema.org/dcsummit

Message

From: Laurie Holmes [lholmes@mema.org]
Sent: 2/1/2018 2:38:05 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]
CC: Lewis, Josh [Lewis.Josh@epa.gov]
Subject: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Emily,
As requested, below is a list of participants for the meeting with Mr. Wehrum at 4:15 on Monday, February 5.
Thank you so much for your assistance in setting up this meeting.

Attendees:

1. Laurie Holmes, MEMA
2. Catherine Boland, MEMA
3. Dave Cetola, Johnson Matthey
4. Greg Garr, Umicore
5. Mike Belwood, Arconic
6. Joseph Fengler, Honeywell
7. Jennifer Heckmann, DENSO
8. Ana Meuweissen, Bosch
9. Erika Nielson, BW
10. Andrew Kenny, Magna

Best,
Laurie

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Thursday, January 18, 2018 3:44 PM
To: Laurie Holmes <lholmes@mema.org>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Laurie,
You are confirmed for a 45 minute in person meeting on Monday, February 5, 2018 at 4:15pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering

the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.

Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information. And based on the size of the room we plan to use, you should plan to bring no more than 10 attendees to this meeting.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Thursday, January 18, 2018 3:08 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Emily,
Yes, Mon. Feb. 5 at 4:15 will work for us.

Is there a number limit for the room? We will have some members with us.

Best,
Laurie

Sent from my iPhone

On Jan 18, 2018, at 11:08 AM, Atkinson, Emily <Atkinson.Emily@epa.gov> wrote:

> Hi Laurie,
>
> It looks like Bill Wehrum could be available for a 45 minute in person meeting on Monday, February 5 at 4:15pm.
>
> Please advise if this could work on your end.
>
> Emily
>
> Emily Atkinson
> Management Analyst/Office Manager
> Immediate Office of the Assistant Administrator
> Office of Air and Radiation, USEPA
> Room 5412B, 1200 Pennsylvania Avenue NW
> Washington, DC 20460
> Voice: 202-564-1850
> Email: atkinson.emily@epa.gov

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Wednesday, January 17, 2018 10:34 AM
To: Lewis, Josh <Lewis.Josh@epa.gov>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Josh,
In addition to the week of the 29th we could also do Monday, February 5 or Tuesday, February 6 before 1.
Let me know if you need additional date ranges to work with.
Best,
Laurie

From: Lewis, Josh [mailto:Lewis.Josh@epa.gov]
Sent: Friday, January 12, 2018 2:16 PM
To: Laurie Holmes <lholmes@mema.org>; Catherine Boland <cboland@MEMA.ORG>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: FW: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

+ Emily and – Bill.

Is there a rough date or dates you were looking to come in?

Josh Lewis
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 564 2095
Ex. 6 Personal Privacy (PP)

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Friday, January 12, 2018 10:56 AM
To: Wehrum, Bill <Wehrum.Bill@epa.gov>
Cc: Catherine Boland <cboland@MEMA.ORG>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Bill, Thank you so much.
Josh, Look forward to hearing from you.

From: Wehrum, Bill [mailto:Wehrum.Bill@epa.gov]
Sent: Friday, January 12, 2018 7:38 AM
To: Laurie Holmes <lholmes@mema.org>
Cc: Catherine Boland <cboland@MEMA.ORG>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Re: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Laurie. I'd be happy to talk with you. I've copied my chief of staff, Josh Lewis, who can help coordinate.

_____
Bill Wehrum
Assistant Administrator
Office of Air and Radiation

U.S. Environmental Protection Agency
(202) 564-7404

On Jan 11, 2018, at 1:33 PM, Laurie Holmes <lholmes@mema.org> wrote:

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It would be helpful if we could discuss with you the impact the program has had and will have on our industry.

Look forward to hearing from you.

Laurie Holmes
Senior Director, Environmental Policy
Motor & Equipment Manufacturers Association
1030 15th Street NW, Suite 500 East
Washington, DC 20005
Direct: 202-312-9247
Ex. 6 Personal Privacy (PP)
<image001.png>
April 10-11 | Washington, DC
www.mema.org/dcsummit

Message

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 11/21/2017 9:48:14 PM
To: ROBERT.WYMAN@lw.com
CC: Loving, Shanita [Loving.Shanita@epa.gov]
BCC: Atkinson, Emily [Atkinson.Emily@epa.gov]
Subject: RE: Request for Meeting

Hi Bob,

It looks like Bill Wehrum could be available for a 45 minute in person meeting on Wednesday, December 13, 2017 at 4:00pm.

Please advise if this could work on your end.

Thank you.
Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Acting Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Friday, November 17, 2017 6:03 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Request for Meeting

Emily – thank you for speaking with me by telephone earlier today. I am writing to request a meeting with Bill Wehrum on the subject of the midterm evaluation and the national greenhouse gas emissions standards for motor vehicles. I make this request on behalf of the ***National Coalition for Advanced Transportation (NCAT)***.

NCAT is a coalition of leading companies that support electric vehicle and other advanced transportation technologies and related infrastructure, including through: energy supply, transmission and distribution; vehicle and component design and manufacturing; charging infrastructure, battery and other energy-storage technology design, production and implementation; infrastructure engineering and construction; and the movement of passengers, goods and services; among other activities. Prior to our meeting, I will provide a list of ***NCAT*** attendees.

If possible, we would like to meet with Mr. Wehrum and appropriate staff, as he determines, on Wednesday, December 13, at any time. Of course, we recognize that his schedule may not permit meeting on this date, in which case we will do our best to accommodate whatever date he selects.

Sincere thanks.

Bob

Robert A. Wyman, Jr.
LATHAM & WATKINS LLP
Email: robert.wyman@lw.com

355 South Grand Avenue
Los Angeles, CA 90071-1560
Direct: +1.213.891.8346

555 Eleventh Street, NW
Washington, DC 20004-1304
Direct: +1.202.654.7119

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Latham & Watkins LLP or any of its affiliates may monitor electronic communications sent or received by our networks in order to protect our business and verify compliance with our policies and relevant legal requirements.

Latham & Watkins LLP

Message

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 2/7/2018 5:32:59 PM
To: Lauren Wilk [lwilk@aluminum.org]
BCC: Atkinson, Emily [Atkinson.Emily@epa.gov]
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi Lauren,

It looks like we could fit this in on Thursday, March 1 at 4:00pm. Let me know if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Wednesday, February 07, 2018 11:01 AM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi, Emily. One of the technical experts I was hoping to bring in for our meeting with Mr. Wehrum will unfortunately be out of the country on Friday 3/2. Is there any chance that Mr. Wehrum would be available to meet on Thursday 3/1, or sometime March 12-16? If not, we'll keep our March 2 meeting and I'll have my colleague prepare his technical materials in advance.

Thanks so much,

Lauren

The Aluminum Association
Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | Ex. 6 Personal Privacy (PP) | F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Tuesday, February 06, 2018 9:25 AM

To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi Lauren,

Yes, we could accommodate a group of 8 attending this meeting.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Monday, February 05, 2018 2:52 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Re: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Thanks, Emily. I appreciate your help in getting this nailed down.

I would like to invite a few member company representatives to join, so I'm curious if there's a hard limit on number of attendees — would 6-8 (as a total group size) be workable?

Best,

Lauren

Lauren Wilk
The Aluminum Association
Office: (703) 358-2981

On Mon, Feb 5, 2018 at 2:38 PM -0500, "Atkinson, Emily" <Atkinson.Emily@epa.gov> wrote:

> Hi Lauren,
> You are confirmed for 45 minute meeting on Friday, March 2, 2018 at 3:00pm with Bill Wehrum.
> Directions and procedures to 1200 Pennsylvania Avenue NW:
>
> > Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.
> >
> > Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Monday, February 05, 2018 12:56 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Aluminum Association Meeting Request

Thanks, Emily. We'll take the meeting on March 2 at 3pm, and I'll firm up attendees on our end.

Let me know what details you need in advance of the meeting.

Much appreciated!

Lauren

The Aluminum Association
Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Monday, February 05, 2018 12:48 PM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Aluminum Association Meeting Request

Hi Lauren,

It looks like Bill Wehrum could be available for a 45 minute meeting on Friday, March 2, 2018 at 3:00pm.

Please advise if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Thursday, February 01, 2018 12:06 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Aluminum Association Meeting Request

Emily and Josh –

Will Lovett suggested I connect with you on scheduling a meeting with Assistant Administrator Wehrum for a few representatives of the aluminum industry. We have availability on the following dates: February 16, 20, 21, 23, 26, 27, 28 or March 1 (but we can certainly be flexible if an alternative date is necessary).

The Aluminum Association is active with EPA on a number of issues – and specifically, the members of our Aluminum Transportation Group (ATG) would very much like to hear directly from Mr. Wehrum about the Administration's priorities related to automotive GHG emissions and fuel economy regulations. The ATG represents the Association's member companies that produce aluminum for use in cars and trucks, including Alcoa, Arconic, Novelis, Rio Tinto and others.

The aluminum industry plays a significant role in the automotive supply chain, and the pounds of aluminum content per vehicle has grown by more than 30 percent over the past decade. Driven by that auto sector growth, the aluminum industry has announced or completed U.S. plant expansions and investments of more than $2.6 billion since 2013. Already this year, Novelis announced that it was investing $300 million in a new greenfield automotive finishing facility in Guthrie, Kentucky. The industry is acutely interested in the outcome of the midterm review on vehicle fuel economy, and we have met previously with the White House, OMB, NHTSA, CARB and others on this topic.

I'd be happy to answer any questions or provide additional background, if that's helpful.

Thanks so much,

Lauren

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T 703.358.2981 Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

Appointment

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 2/7/2018 5:32:19 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Cook, Leila [cook.leila@epa.gov]; Charmley, William [charmley.william@epa.gov]
CC: Moran, Robin [moran.robin@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Caffrey, Cheryl [caffrey.cheryl@epa.gov]

Subject: HOLD || Meet with Aluminum Association - Aluminum Transport Group Members (Tentative)
Attachments: Aluminum Association Meeting Request; Confirmed 3/2 at 3pm: Aluminum Association Meeting Request
Location: WJC-N 5400 + Video with AA

Start: 3/1/2018 9:00:00 PM
End: 3/1/2018 9:45:00 PM
Show Time As: Tentative

Re: automotive GHG emissions and fuel economy regulations
To: Bill Wehrum, Mandy Gunasekara, Chris Grundler, Ben Hengst, Lee Cook, Bill Charmley
Outside Attendees (in person): TBD

Aluminum Association Meet...

Confirmed 3/2 at 3pm: Aluminum ...

Message

From: Lauren Wilk [lwilk@aluminum.org]
Sent: 2/1/2018 5:05:48 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]
Subject: Aluminum Association Meeting Request

Emily and Josh --

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Thanks so much,

Lauren

The Aluminum Association

Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/5/2018 7:38:19 PM
To: Lauren Wilk [lwilk@aluminum.org]
Subject: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi Lauren,
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Management Analyst/Office Manager
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Lauren

Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | C 913.244.2796| F 703.358.2961
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Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

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Lauren

The Aluminum Association

Lauren Wilk
Vice President, Policy & International Trade
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1400 Crystal Drive, Suite 430
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T 703.358.2981 | C 913.244.2796| F 703.358.2961
JOIN THE CONVERSATION:

Appointment

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 2/20/2018 1:17:29 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Cook, Leila [cook.leila@epa.gov]; Charmley, William [charmley.william@epa.gov]
CC: Moran, Robin [moran.robin@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Simon, Karl [Simon.Karl@epa.gov]

Subject: Meet with Alliance for Vehicle Efficiency (Confirmed)
Attachments: FW: Meeting Request (2-20-2018) with Asst. Adm. Wehrum; Confirmed 2/20 at 10am: Meeting Request (2-20-2018) with Asst. Adm. Wehrum
Location: WJC-N 5400 + Video with Ann Arbor Room C174

Start: 2/20/2018 3:00:00 PM
End: 2/20/2018 3:45:00 PM
Show Time As: Tentative

Re: MTE
To: Bill Wehrum, Mandy Gunasekara, Chris Grundler, Ben Hengst, Lee Cook, Bill Charmley
Outside Attendees (in person): TBD

FW: Meeting Request (2-20-2...

Confirmed 2/20 at 10am: Meeting R...

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/5/2018 7:40:36 PM
To: Lee Janger [lee@armitagellc.com]
Subject: Confirmed 2/20 at 10am: Meeting Request (2-20-2018) with Asst. Adm. Wehrum

Hi Lee,
You are confirmed for 45 minute meeting on Tuesday, February 20, 2018 at 10:00am with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.
Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lee Janger [mailto:lee@armitagellc.com]
Sent: Monday, February 05, 2018 12:58 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Request (2-20-2018) with Asst. Adm. Wehrum

Emily,

That works great on our end. Thank you very much for making these arrangements. I will make sure to reach out a few days beforehand to brief you on attendees and materials to be discussed.

Best regards,
-Lee

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Monday, February 05, 2018 12:53 PM
To: Lee Janger <lee@armitagellc.com>
Subject: FW: Meeting Request (2-20-2018) with Asst. Adm. Wehrum

Hi Lee,

It looks like Bill Wehrum and Mandy Gunasekara could be available for a 45 minute meeting on Tuesday, February 20, 2018 at 10:00am.

Please advise if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lee Janger [mailto:lee@armitagellc.com]
Sent: Friday, February 02, 2018 2:19 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Meeting Request (2-20-2018) with Asst. Adm. Wehrum

Ms. Atkinson,

Thank you so much for taking the time to speak with me just now. This email is a follow up on to our brief discussion.

I represent a group of large auto suppliers (BorgWarner, Honeywell, Bosch, and others). Our focus is on advanced powertrain and emission control technologies. We advocate for technology neutral standards that encourage and support innovation across the auto industry.

We are very interested in speaking with Assistant Administrator Wehrum and others in the Office of Air and Radiation regarding the Midterm Evaluation (MTE). In response to the anticipated review, we have prepared data that we believe will assist EPA with their review of the appropriateness of the emissions standards for vehicle model years 2022-2025.

A few months ago, we had a great meeting with Mike Catanzaro at the White House, and after learning about our data review, strongly urged us to meet with your office to discuss our concerns on long term certainty, job growth and future technology investments as these are some of the key factors being looked at for the MTE.

As we finalize our data, I am hoping to arrange a meeting with Mr. Wehrum for **the late morning of February 20th** while many of members will be in Washington, DC. Please let me know if a meeting at that time is possible. We would likely be a group of 5-6 people.

More information on our group can be found at www.VehicleEfficiency.com Please let me know if I can provide any additional information. My contact information is also below.

Thank you again for your time and help.
-Lee

Alliance for Vehicle Efficiency

Lee J. Janger
Director, Legislative and Regulatory Affairs
202.607.0723
Lee@ArmitageLLC.com

>www.VehicleEfficiency.com<

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Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/2/2018 7:23:45 PM
To: Lewis, Josh [Lewis.Josh@epa.gov]
Subject: FW: Meeting Request (2-20-2018) with Asst. Adm. Wehrum

Meeting request for Bill

From: Lee Janger [mailto:lee@armitagellc.com]
Sent: Friday, February 02, 2018 2:19 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Meeting Request (2-20-2018) with Asst. Adm. Wehrum

Ms. Atkinson,

Thank you so much for taking the time to speak with me just now. This email is a follow up on to our brief discussion.

I represent a group of large auto suppliers (BorgWarner, Honeywell, Bosch, and others). Our focus is on advanced powertrain and emission control technologies. We advocate for technology neutral standards that encourage and support innovation across the auto industry.

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Thank you again for your time and help.
-Lee

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Message

From: Tucker, Jamie [jtucker@AKINGUMP.COM]
Sent: 10/23/2017 7:45:52 PM
To: Bolen, Brittany [bolen.brittany@epa.gov]; Feeley, Drew (Robert) [Feeley.Drew@epa.gov]
CC: Letendre, Daisy [letendre.daisy@epa.gov]
Subject: Natural Gas Vehicles As An Alternative Compliance Pathway
Attachments: Updated VNG Comments on EPA-HQ-OAR-2015-0827.pdf; NGV Executive Action Summary.docx

Flag: Follow up

Brittany/ Drew - We want to express our great appreciation for your time today with VNG and Ariel to discuss ways to harmonize regulatory treatment of NGVs and EVs.

As we discussed, VNG is proposing regulatory changes which would address (among other segments) the light-duty truck category which accounts for 64% of new vehicle purchases (and are responsible for even greater amounts of fuel use and pollution if you take into account the differential in fuel economy between light-duty trucks and passenger cars), and for which there is not a viable electrification solution.

Natural gas vehicles provide a cost effective and additional pathway for automaker emissions compliance while preserving the products consumers desire, and are therefore worthy of being included in a portfolio of solutions along with EVs to achieve the objectives.

Specifically, we would encourage the Administration to consider:

- **Restoring the 0.15 "divisor"** in EPA's compliance calculations, equivalent to NHTSA's statutory Petroleum Equivalency Factor that counts a gallon-equivalent of natural gas as 0.15 gallons of gasoline. The previous Administration ended this powerful incentive while simultaneously providing electric vehicles with additional emissions incentives on the hope that EVs would be "game changers." The game has now changed for NGVs. The shale revolution that has occurred since the current rules were set as well the development of Renewable Natural Gas as the lowest carbon vehicle fuel are true game changers that strongly justify returning to the 0.15 divisor.

The powerful and well-justified incentive of the 0.15 divisor would be complemented and made even more effective by additional changes including:

- **Eliminating range requirements on bi-fuel NGVs** that results in an impractical natural gas tank size requirement that is twice the size of the gasoline tank and costly design requirements for NGVs, whereas no such range requirements exists for hybrid electric vehicles. This is the most important regulatory change as a complement to the 0.15 divisor of the three.

- **Providing NGV pick-ups with the bonus credits** provided to "strong electric hybrid pick-ups" and **eliminating the existing minimum 10% deployment threshold** to qualify for pickup bonus credits.

- **Establishing a new incentive to encourage retrofitting existing gasoline and diesel vehicles to run on natural gas**, something that isn't feasible for electric drives but which will reduce emissions by the existing fleet of vehicles

Enclosed for your further consideration are our Midterm Evaluation comments as well as information outlining the rationale for the recommended regulatory changes. We stand at the ready to respond to any questions or recommendations you may have with regard to our MTE recommendations and comments.

Thank you again and we look forward to continuing our dialogue with you and others engaged in the inter-agency process.

Jamie

Jamie Tucker
AKIN GUMP STRAUSS HAUER & FELD LLP
1333 New Hampshire Avenue, N.W. | Washington, DC 20036-1564 | USA | Direct: +1 202.887.4279 | Internal: 24279
Fax: +1 202.887.4288 | jtucker@akingump.com | akingump.com | Bio

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Natural Gas Vehicles (NGVs):
The Common Sense Solution To Achieving Emissions Reduction Compliance At Low Cost and Low Risk

NGVs ideally suited to help pickups, light duty trucks reach 2025 emissions goals

- Light duty trucks face biggest compliance challenge, are critical to Big Three future
- EVs not an option – batteries too expensive, too heavy for larger vehicles
  - NGVs are proven: Ford F150, Chevy Silverado, Dodge Ram

Correcting NGV incentives is straightforward – and justified

- No consideration of NGV technology in 2016 Technical Assessment Report despite availability of abundant domestic fuel and vehicle technology
  - Game-changing Renewable Natural Gas (RNG) delivers more than 85% lifecycle emission reductions
- Restore pre-2015 "0.15 divisor" to harmonize EPA with statutory CAFE incentives,
  - Parity with EV incentives: just as EV incentives reflect renewable energy, restoring 0.15 divisor for NGVs would reflect emissions benefits of RNG (85%)
  - Would allow OEMs to easily meet 2025 targets for pickups
- Parity: eliminate arbitrary driving range requirement imposed on bi-fuel NGVs
  - Plug-in hybrids have no requirements despite much shorter electric range
- Provide NGV pickups with same emissions credits as "Strong Hybrids"
  - Eliminate minimum penetration for NGV pickup incentives: NGVs as 10% of all pickups not immediately feasible for alt fuel like natural gas

Additional opportunity for smarter regulations: encourage retrofits

- Retrofitting deployed vehicles with natural gas reduces emissions of existing fleet
- Build on NGV retrofit successes in Oklahoma, greatly expand benefits of rules
- Allow converters to receive credits based on vehicle's remaining useful life, sell/transfer to OEMs

Restoring parity between NGVs and EVs, and between EPA and NHTSA, will provide automakers much-needed compliance flexibility for light trucks and pickups – and by making these changes effective immediately, we can start building this industry today.

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Comments by VNG.co LLC on
Reconsideration of the Final Determination of the Mid-Term
Evaluation of Greenhouse Gas Emissions Standards
For Model Year 2022–2025 Light-Duty Vehicles

Docket ID: EPA–HQ–OAR–2015–0827

VNG.co LLC is a developer of compressed natural gas (CNG) fuel dispensing infrastructure for light- and medium-duty natural gas vehicles (NGVs). We welcome this opportunity to comment on the Midterm Evaluation (MTE) of light-duty vehicle greenhouse gas standards established for model years 2022-2025 and provide the agencies[1] with much-needed updated information on NGVs and their ability to contribute to the goals of the regulations.

Indeed, NGVs are perhaps the largest and most consequential knowledge gap in the agencies' work on these regulations to date. The only substantive discussion of NGVs in the 1,217 page Technical Assessment Review (TAR) issued by EPA, NHTSA and CARB was one short paragraph noting the growth in CNG fueling infrastructure,[2] and NGVs were not included in the TAR's models for automaker compliance.[3] This is inexplicable considering that U.S. OEMs (the "Big Three") have each produced pickups that operate on compressed natural gas (CNG) in recent years, as well as the fact that there are 22 million NGVs on the road globally - including many produced by OEMs that also serve the U.S. market.

However, this decision to exclude NGVs from serious analysis becomes even more confounding when one considers the radical changes that have occurred in the emissions profile of this technology since the original rulemaking. Renewable natural gas (RNG) can reduce lifecycle greenhouse emissions by 85% or more compared to gasoline, and this ultra-low carbon biofuel now accounts for over 35% of NGV fueling nationally and over 60% of NGV fueling in California. Furthermore, engine manufacturers are beginning to explore the potential of advanced engine designs to take advantage of CNG's high-octane, inherently low-emission properties - another major opportunity to meet the agencies' goals that has been completely unexplored to date.

The virtual exclusion of NGVs from the analysis and discussion has led to the perception of regulators having a false choice between siding with automakers and consumers on one side and environmentalists on the other. Automakers assert that they cannot stop consumers from buying the larger, less fuel-efficient vehicles they want (and in many cases need), and that meeting the current emissions targets for 2025 would impose major costs and risks on their business. Meanwhile, environmentalists insist that we need to transition our entire vehicle fleet to electric vehicles (including hydrogen fuel cell vehicles) as soon as possible, despite the fact

[1] While these Comments are being submitted in the EPA's docket, it is VNG's expectation that they will be also be considered by the National Highway Traffic Safety Administration (NHTSA) and the California Air Resources Board (CARB), collectively "the agencies."
[2] *Draft Technical Assessment Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025*, ENVIRONMENTAL PROTECTION AGENCY (July 2016), at 9-41, https://nepis.epa.gov/Exe/ZyPDF.cgi/P100OXEO.PDF?Dockey=P100OXEO.PDF (hereinafter "Draft TAR").
[3] *Id.* at 5-502.

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that they are not projected to have more than 1-2% market share through at least 2025 – and are especially unlikely to be a practical choice for SUVs and pickups due to their weight and utility requirements.

NGVs are the missing piece of the puzzle. From an automaker's perspective, they offer a proven pathway to dramatically reducing emissions from their large-footprint vehicles, with similar costs and much greater benefits than lightweighting for pickup trucks. For environmentalists, the use of RNG offers similar or even superior emissions benefits to EVs, while also immediately addressing the segments of the auto market (e.g. light trucks) that are unlikely to have an electric alternative for the foreseeable future.

Reforming the light-duty emission regulations to make NGVs a practical compliance path for automakers thus offers the agencies a way to preserve the stringency of existing targets while simultaneously making it easier for automakers to meet them cost-effectively. Equally important, individual Americans will benefit from the use of a cleaner transportation fuel with lower and more stable pricing, compared to gasoline, all while purchasing the vehicles they want and need at reasonable costs. That's a win-win-win.

The following comments detail the reasons for providing robust regulatory support for NGVs on par with previous regulatory support for EVs, organized into the following sections.

- **The Need for Light Truck Alternatives in a Changing Market Context:** Consumer demand is shifting towards large vehicles with relatively low fuel economy. NGVs are ideally suited to provide a low-emission, non-petroleum alternative for the light truck segment, which is unlikely to be served by electric vehicle (EV) alternatives for the foreseeable future.

- **Renewable Natural Gas - A "Waste-to-Wheels" Emissions Game-Changer:** RNG is a game-changer that puts NGVs on par with an EV powered with wind or solar power - and it accounts for a much higher percentage of NGV fuel use than renewable electricity in the overall electricity mix. The rules must account for this dramatic shift and provide incentives for NGVs similar to those provided for EVs.

- **Potential for Rapid Cost Reductions, Consumer Savings with NGVs:** Unlike EVs, NGVs do not depend on inherently-expensive components like batteries, giving them much greater potential for rapid cost reductions with production at scale. This potential has already been demonstrated by European OEMs and gives NGVs much greater potential for mass-market adoption than the agencies have recognized to date.

- **Importance of Dual-Fuel NGVs:** Dual-fuel (commonly referred to as "bi-fuel") vehicles will play an important role in the market development of NGVs during early years of infrastructure buildout. The agencies took steps towards providing important support for bi-fuel NGVs in the original rulemaking, yet also placed unfair restrictions on this support that were not placed on similarly-important plug-in hybrid electric vehicles.

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- **Advanced NGV Technologies Promise Best Emissions Path for Internal Combustion Engines (ICEs):** The development of new engine technologies optimized for CNG's inherently high-octane, clean-burning qualities gives NGVs unsurpassed potential for environmental performance on a mass-market-ready ICE platform.

- **"Bridge to Hydrogen" Needed More Than Ever:** The agencies have previously recognized the ability of NGVs to provide a "bridge" to hydrogen-fueled vehicles thanks to numerous technology synergies on the vehicle as well as the fueling side. The opportunities for such synergies have expanded in recent years, and are as urgently-needed as ever due to the slow market uptake of hydrogen fuel cell vehicles.

- **Emissions Solution for Mid-Life Vehicles:** Sec. 202(a) of the Clean Air Act requires the agencies to regulate vehicle emissions throughout their useful life, but the current light-duty program only provides incentives for low-emission technologies deployed in *new* vehicles. As states like Oklahoma and Utah have shown, there is significant potential to reduce emissions and petroleum use from older vehicles with CNG retrofits, and these benefits should be recognized and encouraged in these regulations.

- **Addressing the Threat of Petroleum Dependence:** The CAFE program was originally created as a response to the oil crisis of 1973; yet, more than 40 years later, the program has done very little to reduce our near-total dependence on petroleum, and the agencies project that the 2017-2025 rules will not make a meaningful difference either. The current regulations ensure this in part by disadvantaging natural gas, perhaps our best hope for a long-term solution to this problem.

- **NGV Reform Needed Today for 2017-2021 Targets:** Because the current disparity between treatment of NGVs and EVs is so clearly arbitrary and contrary to real-world lifecycle GHG emissions, and because automakers need this compliance flexibility and regulatory certainty in order to confidently invest in NGV production, these changes should be made effective immediately – without waiting for the 2022-2025 period. EPA's review of the 2021 targets as part of this proceeding is an excellent opportunity to do so.

In addition to providing information on each of these topics for use in the rulemaking process, we will indicate the specific topics from EPA's Request for Comment that each section is relevant to, and we will conclude each section with a list of recommended changes to the regulations. By updating the regulations to incentivize the deployment of NGVs similar to the previous administration's focus on incentivizing EVs, the agencies will provide automakers with a greater range of compliance pathways that will help achieve the goals of the regulations sooner and more cost-effectively, to the collective benefit of consumers, the environment and industry.

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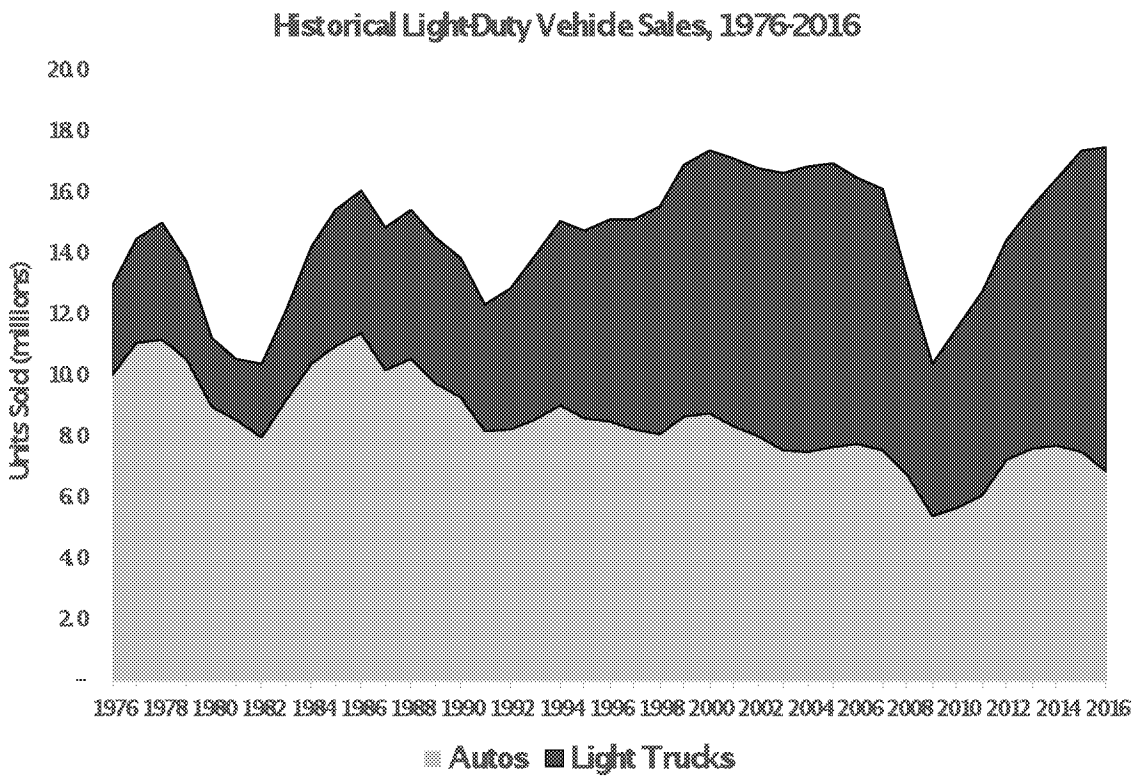
The Need for Light Truck Alternatives in a Changing Market Context

Issues Addressed:

- *The impact of the standards on the automobile industry*
- *The feasibility and practicability of the standards*

As the agencies acknowledged in the 2016 draft Technical Assessment Report (TAR), low gasoline prices have encouraged U.S. consumers to gravitate towards the purchase of larger and less fuel-efficient vehicles. After the Great Recession of 2008 decimated all classes of vehicle sales as well as oil prices, light truck sales have rebounded much more strongly than passenger vehicles and are approaching all-time highs and a market share of over 60%.[4] As the experience of the 1980s-2000s demonstrated, this shift in the market towards light trucks is likely to be sustained if gasoline prices stay low for the long term, as many observers have speculated - including oil majors like Shell, whose CEO recently said that oil prices may be "lower forever."[5]



Source: Bureau of Economic Analysis, 2017[6]

[4] *Auto and Truck Seasonal Adjustment*, BUREAU OF ECONOMIC ANALYSIS (August 2, 2017), https://www.bea.gov/national/xls/gap_hist.xlsx

[5] Sarah Kent, *Shell Prepares for 'Lower Forever' Oil Prices*, WALL ST. J. (July 27, 2017), https://www.wsj.com/articles/royal-dutch-shells-second-quarter-earnings-rise-sharply-1501137915

[6] *Auto and Truck Seasonal Adjustment*, BUREAU OF ECONOMIC ANALYSIS (August 2, 2017), https://www.bea.gov/national/xls/gap_hist.xlsx

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Even if gasoline prices rise again, these large light duty vehicles will always account for a sizable part of the market due to their unique ability to meet specific consumer and business needs. While the footprint-based structure of the rules ensures that automakers will have to increase the fuel economy of all vehicles in order to achieve compliance, the TAR projected that this trend will nonetheless reduce the original projected impacts of the rules on petroleum dependence and greenhouse gas emissions.

The size of light trucks limits the availability of cost-effective solutions to increasing fuel economy and reducing emissions – particularly for full-size pickups, which have added performance requirements. For example, the TAR estimated that the total cost of a 20% mass reduction for towing-capable pickups, which would improve fuel economy and emissions by only 10%, would be roughly $3,000. It is also particularly challenging to electrify light trucks and pickups due to the added cost and weight of the battery packs needed to move these larger vehicles, particularly those built for carrying or towing heavy loads. Indeed, there are very few electric light trucks on the market today and no pickups, and the TAR does not even consider the possibility of electric towing-capable vehicles within the 2025 timeframe.[7]

Pickup trucks are the best-selling vehicles in America, as well as the most important source of profits for the "Big Three" U.S. automakers. Thus, a cost-effective solution to their emissions and petroleum dependence is absolutely essential to ensuring that these companies, their hundreds of thousands of employees, and the millions of consumers and businesses that rely on pickup trucks are not unnecessarily harmed by the agencies' regulations.

Fortunately, and in contrast to electrification, compressed natural gas (CNG) is ideally suited to be a low-emission, non-petroleum alternative fuel for light trucks and pickups especially. Larger vehicle envelopes provide ample room for CNG storage tanks, and since natural gas offers far greater energy density than batteries, it is much better-suited for moving heavy vehicles. These characteristics are why natural gas has long been the clean fuel of choice for heavy-duty vehicles like transit buses and refuse trucks, and the same logic holds true for the heavier side of the light-duty vehicle spectrum.

Indeed, automakers have demonstrated that NGVs are already a viable commercial technology. All three U.S. automakers have offered either CNG-equipped or CNG-ready versions of their flagship full-size pickups, including GM's Chevy Silverado,[8] FCA's Dodge Ram,[9] and Ford's F-

[7] Draft TAR, supra note 2, at 4-40.
[8] Brandon Turkus, *2015 Chevy Silverado HD gets CNG option*, AUTOBLOG (Feb. 6, 2014), http://www.autoblog.com/2014/02/06/2015-chevrolet-silverado-hd-cng-official/.
[9] Richard Truett, *Ram will expand lineup of CNG-powered trucks*, AUTOMOTIVE NEWS (Mar. 4, 2015), http://www.autonews.com/article/20150304/OEM05/150309913/ram-will-expand-lineup-of-cng-powered-trucks.

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150. In fact, in addition to being the best-selling vehicle of any model, the 2016 Ford F-150 was named Green Car Journal's "Green Car of the Year" in part due to the availability of a CNG prep package as an option.[10]

Thus, the rules should encourage automakers to transition these vehicle segments to natural gas in two ways. First, they should be provided strong incentives to do so, including special incentives for pickup trucks similar to the incentive previously created for hybrid-electric pickups. Second, natural gas should be factored into setting targets for what can be reasonably achieved for light trucks and pickups, since this is a mature, proven, commercially-available technology that automakers have already deployed in recent years.

Summary and Recommendations

Because light trucks and pickups especially are a critical market segment for consumers, businesses and automakers, and because neither electrification nor lightweighting are practical alternatives for these heavier vehicles, EPA should provide a clear regulatory pathway for automakers to transition these segments to natural gas.

- Provide emissions credits for all NGVs that reflect the emissions benefits of renewable natural gas (RNG), as discussed in the following section.

- Offer a "Natural Gas Pickup" incentive similar to current hybrid-electric and "performance-based" pickup credits; however, for the natural gas pickup credit, minimum deployment thresholds should be eliminated to reflect the greater market challenges faced by NGVs - since, unlike hybrid-electrics, they use an alternative fuel. Expecting an automaker to immediately transition at least 10% of their critical pickup fleet to an alternative fuel is simply not realistic, and renders the current "performance-based" credit useless despite the fact that natural gas can meet the credit's performance threshold of 20% emission reductions.

    - This goal could be accomplished by inserting a new section (c) under 40 C.F.R. § 86.1870–12, *CO_2 credits for qualifying full-size pickup trucks*, titled "Credits for implementation of natural gas technology." The structure of these credits would be similar to those for sections (a) and (b), but with reduced or eliminated requirements for the "required minimum percent of full size pickup trucks."

[10] *Fuel Efficiency, Alternative Fuels and Sustainability Earn Ford F-150 2016 Green Truck of the Year Award*, FORD MOTOR CO. (Nov. 19, 2015), https://media.ford.com/content/fordmedia/fna/us/en/news/2015/11/19/ford-f-150-earns-2016-green-truck-of-the-year-award.html.

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- Incorporate the use of natural gas when setting targets for practical, achievable emissions improvements for light trucks and full-size pickups.

Renewable Natural Gas - A "Waste-to-Wheels" Emissions Game-Changer

Issues Addressed:

- *The availability and effectiveness of technology, and the appropriate lead time for introduction of technology*
- *Any relevant information in light of newly available information.*
- *The impact of the greenhouse gas emission standards on the Corporate Average Fuel Economy standards and a national harmonized program*

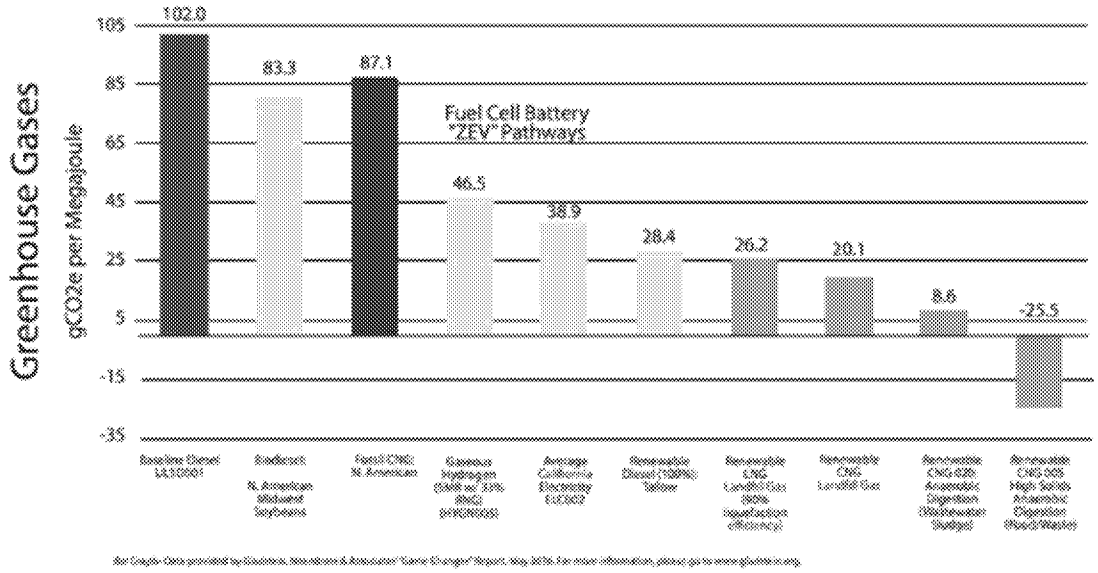
Since the original rulemaking, there has been a dramatic transformation of the lifecycle emissions profile of NGVs due to the rapid adoption of renewable natural gas (RNG) in the transportation sector. Indeed, this is likely the biggest change in the lifecycle emissions of any fuel or vehicle type since the 2011 rulemaking – yet it was completely absent in the draft TAR for reasons that are not clear.

RNG, also known as biogas or biomethane, captures methane produced from a variety of sources including landfills, dairy and livestock operations, and wastewater treatment plants. Once impurities are removed, this methane can be used as a perfect substitute for fossil natural gas, including distribution in the existing natural gas pipeline system and use in NGVs.

Since methane is a powerful greenhouse gas, the use of RNG can achieve massive emission reductions on a CO2-equivalent basis when used as a transportation fuel. While lifecycle emissions can vary significantly depending on the pathway for RNG production, according to the most recent values for the California Low Carbon Fuel Standard (LCFS) it can yield emission cuts of between 70% and *130%*[11] - in other words, NGVs powered by RNG can be carbon-negative, potentially yielding even greater emissions benefits than an electric vehicle powered entirely by solar or wind energy.

[11] Staff Report, CALIFORNIA AIR RESOURCES BOARD, Proposed Re-Adoption of the California Low Carbon Fuel Standard. Dec. 2014. https://www.arb.ca.gov/regact/2015/lcfs2015/lcfs15isor.pdf.

VNG



Source: Gladstein, Neandross & Associates[12]

In the original 2017-2025 rulemaking, EPA recognized the potential for RNG to deliver "game-changing" lifecycle GHG emissions for NGVs, but stated that the agency "believe[d] that biomethane will remain a small part of the overall natural gas market for the foreseeable future."[13] This belief is, simply put, outdated. Today, RNG fueling is increasingly the norm for NGVs thanks to the federal Renewable Fuel Standard (RFS) and the California Low Carbon Fuel Standard (LCFS). While these programs were in their infancy during the original rulemaking in 2011, they have since emerged as powerful economic drivers for RNG use in transportation, thanks to the reclassification of RNG as a cellulosic biofuel by EPA[14] as well as CARB's ranking of it as the lowest GHG fuel on the market. [15] Today, the value of these RFS and LCFS credits has made RNG commercially competitive with fossil natural gas.[16]

This economic driver has led to the very rapid increase in the production and sale of RNG fuel to the transportation sector – particularly in California, where fuel retailers can benefit from sales of both LCFS and RFS credits and where there are the largest number of NGVs and natural gas fueling stations. According to the RNG Coalition, over 60% of NGV fueling in California and 35%

[12] *Game-Changer: Next Generation Heavy Duty Natural Gas Engines Fueled By Renewable Natural Gas*, GLADSTEIN, NEANDROSS AND ASSOCIATES (May 2016), http://ngvgamechanger.com/pdfs/GameChanger_FullReport.pdf
[13] 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, 77 Fed. Reg. 62815 (Oct. 15, 2012) (hereinafter "*2012 Light Duty GHG Standards*").
[14] "Renewable Fuel Pathways II Final Rule to Identify Additional Fuel Pathways under Renewable Fuel Standard Program Documents." ENVIRONMENTAL PROTECTION AGENCY. July 18, 2014. https://www.epa.gov/renewable-fuel-standard-program/renewable-fuel-pathways-ii-final-rule-identify-additional-fuel-0
[15] Staff Report, CALIFORNIA AIR RESOURCES BOARD, Proposed Re-Adoption of the California Low Carbon Fuel Standard (Dec. 2014), https://www.arb.ca.gov/regact/2015/lcfs2015/lcfs15isor.pdf
[16] *The Feasibility of Renewable Natural Gas as a Large-Scale, Low Carbon Substitute*, UC DAVIS INSTITUTE OF TRANSPORTATION STUDIES, June 2016. https://www.arb.ca.gov/research/apr/past/13-307.pdf

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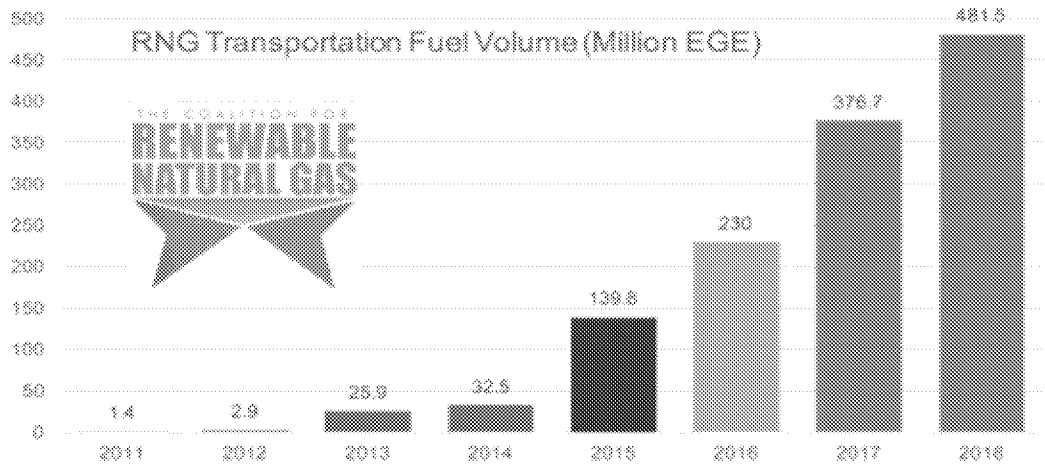
nationally comes from RNG.[17] In terms of absolute volumes, RNG fuel use in transportation increased fivefold between 2013 and 2015, and the Coalition projects it will more than quadruple between 2015 and 2018.



Source: RNG Coalition, Fleets & Fuels Magazine[18]

With this trajectory of RNG growth, the emissions benefits of NGVs today are already at least as powerful as EVs and likely even greater. Thus, ignoring the growth of RNG is not only outdated, but it renders the regulations ineffective in their stated goal of reducing GHG emissions. It also inhibits job creation not only in the NGV industry but the RNG industry as well, which has the potential to create jobs at farms and municipalities across the country through the capture and sale of locally-produced renewable fuel.

In addition to missing an opportunity to achieve the goals of the regulations, the failure to recognize the emissions benefits of RNG has also resulted in EPA effectively negating Congressional incentives for NGVs under the CAFE program. According to Sec. 6 of the Alternative Motor Fuels Act (AMFA)[19] codified as 49 U.S. Code § 32905, the fuel economy of NGVs and EVs alike is to be calculated using the Petroleum Equivalency Factor (PEF) that treats every gallon-equivalent of compressed natural gas or equivalent electrical energy as 0.15 gallons of gasoline. The goal of this technology-neutral statutory calculation was to provide automakers with a strong incentive to manufacture ***both*** types of alternative fuel vehicles to achieve the goal of American energy independence. By encouraging the production of vehicles that reduce the use of higher-carbon petroleum fuels, the statute also reduces emissions.

While the statute requires that NGVs and EVs be treated the same in terms of measuring fuel economy, there is no equivalent law governing measurement of GHGs. EPA chose to follow

[17] Patrick Couch, *RNG in California: More Than You Think*, FLEETS AND FUELS (Apr. 20, 2016), http://www.fleetsandfuels.com/fuels/cng/2016/04/rng-in-california-more-than-you-think/.
[18] *Id.*
[19] Alternative Motor Fuels Act of 1988, Public Law 100-494, 102 Stat. 2441.

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Congressional CAFE incentives through model year (MY) 2015[20] but thereafter to give NGVs credit for only their tailpipe emissions reductions of approximately 20% compared to gasoline instead of the "0.15 divisor,"[21] while temporarily treating EVs as having *zero* emissions.[22] In its original 2017-2025 rulemaking, EPA acknowledged that this calculation for EVs failed to account for the upstream emissions produced by EVs from power generation but claimed that the long-term potential of EVs to produce "game-changing" emissions when charged with renewable electricity justified this unprecedented incentive.[23]

By contrast, in the same rulemaking EPA recognized the potential for RNG to deliver "game-changing" lifecycle GHG emissions for NGVs, but stated that the agency "believe[d] that biomethane will remain a small part of the overall natural gas market for the foreseeable future."[24] As discussed above, this expectation has been proven wrong for natural gas transportation. To be consistent with this new reality and the goals of the regulation, as well as with the goal of harmonizing EPA's regulations with the statutory CAFE program, the rules should give *both* fuels incentives that reflect their "game-changing" emissions potential: for NGVs, this means credits that are equivalent to 100% RNG fueling, in the same way that the 0 g/mi incentive for EVs is equivalent to the use of 100% renewable electricity.

It would be justifiable to calculate the emissions of a 100% RNG-fueled NGV as 85% below that of a gasoline vehicle - which would be in line with the average cited in the NPC's topic paper on the subject[25] as well as a return to the "0.15 divisor" in line with CAFE's PEF calculation. And, because the present bias towards EV incentives represents the most egregious inconsistency of EPA's regulations with the CAFE program, we believe it is also justifiable to make this change effective immediately, instead of waiting for 2022.

Summary and Recommendations

RNG has transformed the emissions of NGVs since the original rulemaking, accounting for 35% of NGV fueling nationally and delivering emission reductions of 70% to 130%. Because of this game-changing emissions potential, and because existing EPA incentives for alternative fuels are biased towards EVs and disruptive of Congressionally-mandated CAFE incentives for NGVs, the emission calculation for NGVs should be reformed effective immediately.

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[20] Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards, 75 Fed. Reg. 25716 (May 7, 2010)
[21] *2012 Light Duty GHG Standards* at 62623, 62816.
[22] *Id.* at 62819.
[23] *Id. at* 62820.
[24] *Id.* at 62815.
[25] Report, NATIONAL PETROLEUM COUNCIL, *Advancing Technology for America's Transportation* (2012), http://www.npc.org/reports/trans.html.

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- NGV emissions calculations should return to the "0.15" divisor used before 2016, with emissions calculated as 85% below a gasoline vehicle. This is both justified by the real-world emissions benefits of RNG and is consistent with the CAFE program.

    - We recommend reinstating language from the MY 2011-2016 regulations under 40 C.F.R. § 600.510–12, *Calculation of average fuel economy and average carbon-related exhaust emissions*: "For natural gas-fueled model types . . . the carbon-related exhaust emissions value calculated for that model type in accordance with paragraph (b)(2) of this section multiplied by 0.15 and rounded to the nearest gram per mile, except that manufacturers complying with the fleet averaging option for N_2O and CH_4 as allowed under § 86.1818 of this chapter must perform this calculation such that N_2O and CH_4 values are not multiplied by 0.15.[26]"

- This change should be effective retroactively to model year 2017, given the major impediment to NGV adoption posed by the current incentive structure as well as the uniquely egregious regulatory overreach it represents compared to the CAFE program.

- To mirror EV incentives, EPA could consider a similar volume-based transition after 2022 to a regime that considers the real-world use of RNG just as EV incentives will ultimately be calculated based on real-world lifecycle emissions; this would be relatively simple to do since EPA already tracks RNG use under the RFS program.

Potential For Rapid Cost Reductions, Consumer Savings with NGVs

Issues Addressed:
- *The cost on the producers or purchasers of new motor vehicles*
- *The feasibility and practicability of the standards*

As part of a shift towards a serious analysis of NGVs in the MTE, the agencies must consider not only the current costs of NGVs but their potential for very rapid cost reductions with production at scale. Indeed, while the current incremental prices of CNG pickups are typically $10,000 or more (including upfitting costs), these high costs are primarily due to the need to spread significant up-front design and certification costs over a small number of vehicle sales.

The 2012 report "Advancing Technologies for America's Transportation Future" by the National Petroleum Council (NPC) estimates that about two thirds of the incremental cost of a NGV pickup comes from these areas, and that incremental costs could be reduced to $3,500 per vehicle by 2020 simply by moving to high-volume production (over 100,000 vehicles per year).[27]

[26] 40 C.F.R. § 600.510–12(j)(2)(iii)(A).
[27] Report, NATIONAL PETROLEUM COUNCIL, *Advancing Technology for America's Transportation* (2012), http://www.npc.org/reports/trans.html.

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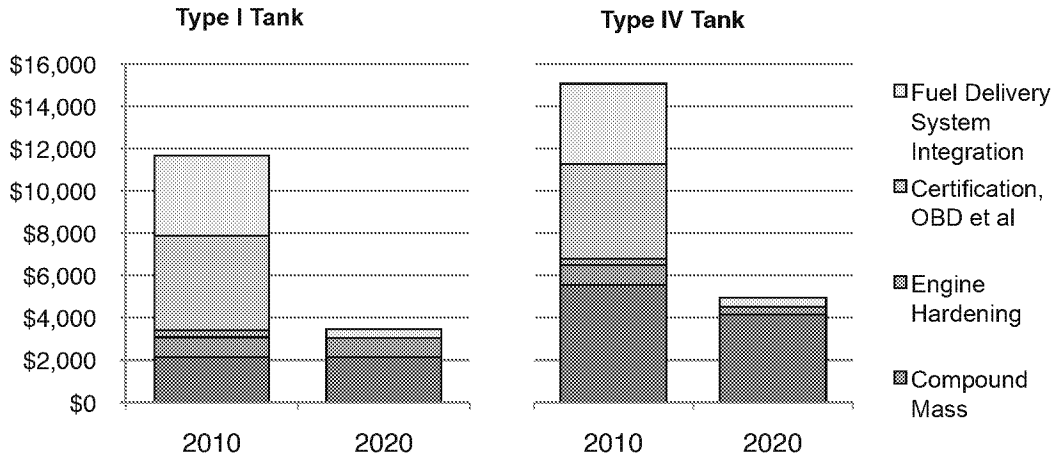
These projections are based in part on experiences in major NGV markets in Europe like Italy and Germany, where volume production has driven incremental costs down to $3,000 or less.[28]

Projected NGV Pickup Incremental Costs, National Petroleum Council



This compares very favorably to the current and projected incremental costs of electric and plug-in electric vehicles. Unlike NGVs, which use the same internal combustion engine platforms as gasoline vehicles and mostly only require the addition of a compressed gas tank made of steel or composites, EVs use batteries that require numerous expensive components and can only reduce costs relatively slowly. This is a critical difference for the agencies to incorporate into their planning, given much greater potential for near-term mass-market adoption of NGVs.

The mass-market potential of NGVs is due to the combination of (potentially) low incremental costs along with the lower and more stable price of natural gas compared to petroleum fuels, which allows the incremental cost to be recouped relatively quickly. According to modeling done in conjunction with the NPC study, this combination gave NGVs the potential to achieve a 17 percent light-duty vehicle market share by 2020 - more than twice the combined market share of electric and plug-in electric vehicles given their projected cost improvements.[29] While this 2012 forecast is clearly unrealistic from the perspective of 2017, the impressive potential for mass-market adoption of a cleaner fuel - and *much* cleaner when RNG is used instead of fossil natural gas - remains an opportunity that should be seriously considered in the agencies' analysis and target-setting.

Indeed, putting aside the comparison to EVs, the potential incremental costs for NGV pickups are comparable to the projected costs for 20% mass reduction via lightweighting cited earlier - $3,000 per pickup. However, as previously stated, lightweighting is forecasted to yield a fuel economy and emissions improvement of only 10%. NGV pickups at scale would have a similar

[28] Rohan Nath et al., *A Realistic View of CNG Vehicles in the US*, BCG PERSPECTIVES (June 16, 2014), https://www.bcgperspectives.com/content/articles/energy_environment_automotive_realistic_view_cng_vehicles_us/.
[29] *Id.*

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incremental cost, yet deliver *twice* the emission reductions with fossil natural gas and many times that with RNG. NGV pickups also completely eliminate petroleum dependence, protecting this critical market segment (and all the consumers, businesses, and workers that depend on it) from oil price swings.

Thus, natural gas deserves to be included in the formulation of the targets for pickups and other light trucks just like other fuel efficiency technologies that have been proven to be cost-effective at scale. This would significantly increase the achievable fuel economy and emissions improvements for these segments within the timeframe of the rulemaking and thus provides a strong rationale for potentially maintaining the existing targets. [30]

Summary and Recommendations

Because NGVs have been proven to deliver rapid and deep cost reductions with high-volume production, the agencies should incorporate them as such into their analysis.

- Modeling used to set achievable emissions curves for pickups and light trucks should include natural gas as a proven technology at costs based on high-volume adoption, not their current incremental costs at low production volumes.

Importance of Dual-Fuel NGVs

Issues Addressed:
- *The impact of the standards on the automobile industry*
- *The feasibility and practicability of the standards*

Dual-fuel NGVs (referred to in the industry as "bi-fuel" NGVs) that operate primarily on CNG but can also operate on gasoline as a backup fuel are likely to play a critical role in winning market adoption of NGVs more broadly. The ability to fuel on gasoline as a backup fuel effectively eliminates consumers' "range anxiety" while CNG fueling infrastructure is not yet as widely available as gasoline, in the same way that dual-fuel electric vehicles (referred to in the industry as plug-in hybrid electric vehicles, or PHEVs) like GM's Chevy Volt have played an important role in expanding the early market for EVs.

The 2017-2025 rulemaking made a major stride towards recognizing the potential benefits of dual-fuel NGVs, which had previously only been assumed to fuel on CNG for 50% of the time. EPA recognized that drivers purchasing dual-fuel NGVs as well as PHEVs are likely to live in areas where fueling (or charging, respectively) infrastructure is reasonably available, and will also preferentially use these alternative fuels whenever possible given their lower cost

[30] Starting the NPC's eight-year projection in 2017 instead of 2012 would imply that an NGV market share of 17 percent could be achieved by 2025 with huge reductions of emissions and petroleum consumption.

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compared to gasoline. Thus, the rules allowed automakers to calculate the fuel usage of both dual-fuel NGVs and PHEVs using a method called the "utility factor" which bases relative consumption of alternative fuels versus gasoline on the vehicle's range on the alternative fuel.[31]

Using this method, a dual-fuel NGV with 250 miles of CNG range – such as the 2015 Dodge Ram[32] – would be assumed to operate on CNG 97.1% of the time, making them nearly as beneficial as a dedicated NGV. PHEVs would receive a similar calculation, although their much shorter all-electric range makes the incentive relatively less beneficial. For example, in the original rulemaking EPA estimated that the Chevy Volt would receive a utility factor of 69% for an all-electric range of 50 miles. [33]

However, despite the fact that utility factors for dual-fuels are ostensibly to be calculated based on their range on alternative fuels, EPA has saddled dual-fuel NGVs with a unique and onerous additional requirement: they must have a CNG range at least double that of their gasoline range in order to qualify for the utility factor calculation, or else they default to an assumed baseline 50% CNG fuel use.[34] Not only that, to be eligible for the incentive, the dual-fuel NGVs must be designed to only use gasoline when the CNG tank is empty.

This requirement is inconsistent with the EPA's assumption that dual-fuel vehicles will fuel as often as possible on CNG for economic reasons, which would imply that their proportion of CNG use should be solely determined by their CNG range according to the utility factors – and not by their gasoline range. Adding further inconsistency, PHEVs face no such requirements, despite the fact of their much more limited all-electric range.

In addition to rendering incentives for dual-fuel NGVs less effective, this requirement adds marketing challenges and, significantly, unnecessary costs to automakers and consumers. To date, the configurations offered by automakers have focused on vehicles that maintain full range on gasoline in order to provide as long of a combined range as possible as well as flexibility; for instance, the dual-fuel GM Silverado has a combined CNG and gasoline range of 650 miles (with the majority coming from gasoline) and allows drivers to switch fuels by flipping a switch.[35]

Beyond unnecessarily restricting customer appeal, the CNG-to-gasoline driving range requirement would require automakers to reduce the size and capacity of the existing gasoline fueling systems in dual-fuel NGVs, which will impose additional costs on manufacturers that will

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[31] *2012 Light Duty GHG Standards* at 62829.
[32] Richard Truett, *Ram will expand lineup of CNG-powered trucks*, AUTOMOTIVE NEWS (Mar. 4, 2015), http://www.autonews.com/article/20150304/OEM05/150309913/ram-will-expand-lineup-of-cng-powered-trucks.
[33] *2012 Light Duty GHG Standards* at 62828.
[34] *Id.* at 62829.
[35] Brandon Turkus, *2015 Chevy Silverado HD gets CNG option*, AUTOBLOG (Feb. 6, 2014), http://www.autoblog.com/2014/02/06/2015-chevrolet-silverado-hd-cng-official/.

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have to be passed on to consumers. Today's dual-fuel pickup truck designs leave the existing gasoline fueling systems intact and simply add CNG storage capacity by placing the CNG tank in the bed of the pickup truck. Downsizing the gasoline fueling system would require additional design, manufacturing, and certification costs that would serve no purpose other than meeting an arbitrary and unnecessary regulatory requirement.

Of course, automakers could also pursue an alternative pathway and maintain the existing gasoline tank size and instead greatly increase CNG fueling capacity. However, this would require tripling or quadrupling the number of CNG tanks currently installed in vehicles like the dual-fuel Dodge Ram, which would add so much weight and take up so much space in the pickup bed that it would be completely unusable for the work fleets that depend on these vehicles. Once again, the current requirement forces automakers to make changes that would increase costs and reduce market acceptance in order to receive full regulatory benefits.

Allowing all NGVs to receive the full utility factor credit for CNG use would remove an unnecessary, ineffective, and arbitrary regulatory impediment to the development of this crucial market segment for stimulating growth in the wider NGV industry.

Summary and Recommendations

Because dual-fuel NGVs are critical for market development and consumer acceptance, and because the agencies should strive to be consistently technology-neutral in their incentives, the unique requirements for dual-fuel NGVs to receive credits based on utility factor calculations should be eliminated.

- Remove the utility factor requirements for a 2:1 ratio of CNG-to-gasoline range, as well as the requirement for dual-fuel NGVs to only use gasoline when the CNG tank is empty.
    - This goal could be achieved by deleting the requirements contained in 40 C.F.R. § 600.510–12, *Calculation of average fuel economy and average carbon-related exhaust emissions*, part (c)(2)(vii)(B) for fuel economy and (j)(2)(vii)(B) for emissions.

Advanced NGV Technologies Promise Best Emissions Path For ICEs

Issues Addressed:

- *The impact of the standards on advanced fuels technology, including but not limited to the potential for high-octane blends*
- *The impact of the standards on compliance with other air quality standards;*
- *The availability of realistic technological concepts for improving efficiency in automobiles that consumers demand, as well as any indirect impacts on emissions;*

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Going beyond today's NGV technology, the agencies should consider the enormous untapped potential of natural gas to deliver even greater environmental and fuel economy benefits in the future. As the highest-octane, cleanest hydrocarbon fuel, natural gas has very favorable physical properties for unsurpassed performance from an internal combustion engine – if automakers are sufficiently incentivized to invest in developing this fuel to its full potential.

Natural gas has 130 octane, far beyond what gasoline – even ethanol-blended gasoline – can provide. In the "Advancing Technologies for America's Transportation Future" study, the NPC projected that this could yield fuel economy up to double that of conventional vehicles when combined with direct injection technologies that fully utilize the properties of CNG.[36] The leading CNG conversion company Westport Innovations is already investigating the potential for natural gas-fueled advanced powertrains that exploit these properties for pickup trucks, with a turbocharged direct injection platform that could reduce carbon emissions by at least 30%.[37]

The potential environmental benefits of CNG aren't limited to greenhouse gases. In 2015, Cummins Westport International (CWI) introduced a heavy-duty CNG engine that was the first engine of any kind to meet the California Air Resources Board (CARB) optional low-NOx emission standard of 0.02 g/bhp-hr NOx – 90% below the 2010 EPA certification level.[38] Owing to the inherently cleaner chemistry of natural gas compared to petroleum-based fuels, similar improvements in performance for NOx emissions could likely be achieved for light-duty vehicles given sufficient automaker interest and investment. While NOx emissions are much lower for gasoline-fueled vehicles compared to diesel vehicles, they are still significant, making this a major untapped opportunity to address smog-forming emissions on our roads.

Agency staff should study the potential of advanced technology to further improve the emissions profile of NGVs, in the same in-depth manner that it has investigated the current and future state of EV and FCV technology. Furthermore, it should incorporate this potential in its assessment of the "game-changing" potential of NGVs as justification for strong incentives.

Summary and Recommendations

[36] Report, NATIONAL PETROLEUM COUNCIL, *Advancing Technology for America's Transportation* (2012), http://www.npc.org/reports/trans.html.
[37] *Methane: The Performance Fuel*, WESTPORT INNOVATIONS (October 2015) https://cleancities.energy.gov/files/u/news_events/document/document_url/128/Brad_Douville__Westport_NGVTF_.pdf
[38] *Game-Changer: Next Generation Heavy Duty Natural Gas Engines Fueled By Renewable Natural Gas*, GLADSTEIN, NEANDROSS AND ASSOCIATES (May 2016), http://ngvgamechanger.com/pdfs/GameChanger_FullReport.pdf

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Because of the high-octane, low-emission properties of natural gas, the agencies should fully study the ability of advanced NGV technologies to further reduce CO2 and smog-forming pollutants and incorporate the results into regulatory incentives and long-term target setting.

- The ability of NGVs to deliver unsurpassed fuel economy for an ICE vehicle should be used as a further rationale for returning to the use of the "0.15 divisor" for calculating NGV emissions, as discussed in the above section on RNG.

"Bridge to Hydrogen" Needed More Than Ever

Issues Addressed:

- *The availability and effectiveness of technology, and the appropriate lead time for introduction of technology*
- *Any relevant information in light of newly available information.*

In awarding advanced technology multiplier incentives to NGVs, the original light-duty vehicle rulemaking in 2012 recognized that there are numerous technical synergies between the development and commercialization of NGVs and hydrogen fuel cell electric vehicles (FCVs) owing to the physical similarities between methane and hydrogen. The agencies wrote that "CNG investments have the potential to facilitate the introduction of hydrogen FCVs in several respects," including innovations in advanced storage materials and tube trailer designs, improved designs for compressors and fuel dispensers, and on-site production of hydrogen from natural gas feedstock. VNG helped to lay out this rationale in a white paper, "NGVs: An Essential Bridge to Hydrogen," commissioned from the consultancy Energy Futures.[39]

Since 2012, the FCV industry has taken its first steps towards commercialization, with Toyota, Honda, and Hyundai each offering models for the U.S. market. The TAR was cautiously optimistic about the uptake of these technologies, with an estimated 125,000 FCVs deployed in California by 2025 thanks to the Zero Emissions Vehicle (ZEV) mandate. However, this does not mean they are fully commercial technologies; indeed, it means that the need for NGV synergies to accelerate the development of this market has been elevated from the realm of the theoretical to the practical. The need is particularly urgent in the area of hydrogen fueling infrastructure, as the TAR estimated that hydrogen fuel demand could begin to outpace infrastructure availability as early as 2019 and as late as 2026.

As noted in the original rulemaking, some of the strongest synergies between these fuels are in the area of infrastructure development. Both CNG and hydrogen fueling stations require the same types of equipment, including compressors, high-pressure storage tanks, and gaseous fuel dispensers. Shared standards, equipment designs, production and operational economies

[39] *Natural Gas: An Essential Bridge to Hydrogen Fuel Cell Vehicles,* ENERGY FUTURES (2011) http://vng.co/wp-content/uploads/2012/05/Natural-Gas-An-Essential-Bridge-To-Hydrogen-Fuel-Cell-Vehicles.pdf

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of scale, and technology innovations in this area could simultaneously drive down costs for both fuels. The September 2014 report "Transitioning the Transportation Sector: Exploring the Intersection of Hydrogen Fuel Cell and Natural Gas Vehicles" by the Sandia National Laboratory[40] goes further, with a concept design for a combined hydrogen and natural gas fueling station that "could improve operational expenditures and also take advantage of common supply chains."

The TAR also noted that "implementation of renewable hydrogen sourcing has posed a financial challenge" for stations developed to date, despite a minimum renewable content of 33% to receive grants from the California Energy Commission and greater incentives for 100% renewable hydrogen stations. RNG is an ideal feedstock for renewable hydrogen production via steam methane reforming (SMR) technology, but the market for FCVs is currently too small to drive widespread development of these resources. As discussed earlier in these comments, increasing the deployment of RNG-fueled NGVs is key to building the market and growing demand for this ultra-low GHG fuel in the near term, ensuring sufficient supplies of RNG for renewable hydrogen production in the longer term.

Finally, these synergies may also yield benefits in the opposite direction, with advances in hydrogen improving the emissions profile of NGVs. The TAR recognizes the potential benefits of power-to-gas applications, in which large-scale wind and solar generation can be used to create hydrogen for blending into natural gas pipelines. While it is discussed in the context of reducing the lifecycle emissions of hydrogen production, this is also clearly relevant to reducing the lifecycle emissions of CNG. The 2013 report "Blending Hydrogen into Natural Gas Pipeline Networks" by the National Renewable Energy Laboratory[41] estimates that natural gas pipelines could accommodate blends of 5-20% hydrogen content with no technical changes by end users (e.g. NGVs), which would not only reduce the overall carbon content of natural gas but also reduce methane leakage from the pipeline system (since hydrogen, as a lighter molecule, would escape from leaks first and 'crowd out' methane).

The NREL report notes that "conceivably, a credit trading system could apply to natural gas with a specified blend content of renewable hydrogen, paralleling the renewable energy credit system used in the electricity sector." In fact, such programs already exist in the transportation sector: the LCFS and RFS programs both allow for the addition of new low-carbon and renewable fuel pathways, and renewable hydrogen-enriched natural gas sold as fuel for NGVs could readily fit within these schema. As with RNG, NGVs can play a crucial role in building this

[40] *Transitioning the Transportation Sector: Exploring the Intersection of Hydrogen Fuel Cell and Natural Gas Vehicles*, SANDIA NATIONAL LABORATORY (2014), https://energy.gov/sites/prod/files/2015/02/f19/2015-01_H2NG-Report-FINAL.pdf

[41] *Blending Hydrogen into Natural Gas Pipeline Networks: A Review of Key Issues*, NATIONAL RENEWABLE ENERGY LABORATORY (2013), http://www1.eere.energy.gov/hydrogenandfuelcells/pdfs/blending_h2_nat_gas_pipeline.pdf

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market in the near term to ensure the availability of renewable, low-emission feedstocks for hydrogen fuel production in the long term.

In all these ways, NGVs could provide much-needed boosts to the development of the FCV industry. On the commercialization side, NGVs will help stimulate adoption of FCVs through lower costs and expanded infrastructure availability, and on the environmental side the expansion of availability of renewable gas feedstocks will maximize the climate benefits of these vehicles. Indeed, NGVs and FCVs should be considered part of the same gaseous fuel pathway and recognized as such in regulations that fully account for and promote the lifecycle benefits of ultra-low GHG gaseous fuel blends.

Summary and Recommendations

The widespread adoption of RNG fueling for NGVs has only increased the synergies between NGVs and FCVs. As such, the agencies should continue to recognize the linkage between these fuels as part of an advanced gaseous fuel pathway for game-changing, long-term emission reductions.

- The mutually-reinforcing ability of both NGVs and FCVs to deliver "game-changing" emission reductions should be used as a further rationale for returning to the use of the "0.15 divisor" for calculating NGV emissions, as discussed in the above section on RNG.

Emissions Solution for Mid-Life Vehicles

Issues Addressed:
- *The impact of the standards on consumer behavior, including but not limited to consumer purchasing behavior and consumer automobile usage behavior.*

Sec. 202(a) of the Clean Air Act requires the agencies to regulate vehicle emissions throughout their useful life, but the current light-duty program only provides incentives for low-emission technologies deployed in *new* vehicles. This is becoming an issue because the past decade has seen a slow, steady increase in the average life of vehicles on our roads, and particularly for light trucks. According to data from the Bureau of Transportation Statistics, the average life of cars on US roads has increased from 9.5 years in 2005 to 11.5 years in 2015[42] - surpassing the 10 year vehicle life currently considered by the agencies.

This trend will likely continue and accelerate if regulations drive up the cost of new vehicles by thousands of dollars, as the agencies themselves have estimated. This will encourage drivers to hold onto their older, less fuel-efficient, and more polluting cars and light trucks for longer and longer, undermining the benefits of the regulations.

[42] *Transportation Energy Databook 2016*, OAK RIDGE NATIONAL LABORATORY, http://cta.ornl.gov/data/index.shtml

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With conventional gasoline cars and trucks, it is essentially impossible to improve the fuel economy and emissions of a given vehicle after it rolls off the assembly line. However, retrofitting existing vehicles to fuel on natural gas has long been a major part of the NGV industry, particularly in states like Oklahoma[43] and Utah[44] that have actively sought to promote the retrofit market. The robust retrofit ecosystem in place for NGVs is fully capable of addressing this market, and the updated certification requirements for remarketed and used vehicles established by EPA in 2012[45] could make this a very cost-effective way to deliver real emissions and petroleum consumption benefits.

While expanding the rules to include emission and petroleum reductions from vehicles that have already been sold is novel, the environmental and energy security benefits that would result are just as meaningful as those stemming from sales of cleaner, more efficient new vehicles.

One way to incentivize retrofits of existing vehicles would be to allow EPA-certified conversion companies to "opt in" to the regulation for the purpose of generating credits for every vehicle they retrofit to operate on natural gas. These credits would be pro-rated based on the vehicle's projected remaining useful life - for instance, a vehicle that is five years old (halfway through the current 10 year/100,000 mile definition of useful life used by the agencies) would receive credits equal to 50% of the emissions benefits of a new NGV, including the "0.15 divisor" and the full-size pickup bonuses proposed in previous sections. The conversion company could then sell the credits to automakers looking to reduce their compliance costs in a given vehicle category.

Incentives for the development of the aftermarket upfit and retrofit ecosystem could also be incorporated into regulations for new vehicles, by including credits for CNG "prep packages" in the off-cycle credit program. For instance, the previously-mentioned 2016 Ford F-150 pickup has a CNG "prep package" including hardened valves, valve seats, pistons and piston rings, which significantly reduces the future cost of upfitting/retrofitting the vehicle for CNG operation.[46] Since this feature increases the likelihood that vehicles will be converted to a low-emission, non-petroleum fuel, it should be included on the off-cycle credit menu.

We encourage the agencies to consider these and other creative solutions to incorporate retrofits and aftermarket upfits into the rules. Doing so would help to counter the environmental and petroleum consumption impacts of increasing vehicle life, encourage closer collaboration between automakers and conversion companies, and improve the rules' cost-effectiveness.

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[43] Jay F. Marks, *CNG vehicle conversion business is booming for Oklahoma company*, THE OKLAHOMAN (Mar. 16, 2012), http://newsok.com/article/3658028.
[44] Clifford Krauss, *Surge in Natural Gas Has Utah Driving Cheaply*, N.Y. TIMES (Aug. 29, 2008), http://www.nytimes.com/2008/08/30/business/30gascars.html.
[45] *Certification and Compliance for Vehicles and Engines*, ENVIRONMENTAL PROTECTION AGENCY, https://www3.epa.gov/otaq/consumer/fuels/altfuels/altfuels.htm.
[46] *First Compressed Natural Gas and Propane-Capable 2016 Ford F-150 Rolls Off The Line At Kansas City*, FORD MOTOR CO. (Dec. 9, 2015), https://media.ford.com/content/fordmedia/fna/us/en/news/2015/12/09/first-compressed-natural-gas-and-propane-capable-2016-ford-f-150.html.

VNG

Summary and Recommendations

NGVs offer a unique, proven pathway to reducing the emissions and petroleum consumption of the existing vehicle fleet, which is likely to be a growing issue as vehicle lifespans continue to be extended. Accordingly, the existing ecosystem of NGV conversion companies (as exemplified by states like Oklahoma and Utah) as well as OEMs should benefit from regulatory incentives for serving this important potential market.

- Allow EPA-certified converters to "opt in" to the program and generate credits for CNG retrofits and upfits that can subsequently be sold to automakers.

- Provide emission credits for CNG "prep packages" that reduce the costs of subsequent conversion to natural gas, as part of the off-cycle credit technologies listed at 40 C.F.R. § 86.1869–12, *CO_2 credits for off-cycle CO_2-reducing technologies.*

Addressing the Threat of Petroleum Dependence

Issues Addressed:
- *The cost on the producers or purchasers of new motor vehicles or new motor vehicle engines*
- *The impact of the standards on consumer behavior, including but not limited to consumer purchasing behavior and consumer automobile usage behavior (e.g. impacts on rebound, fleet turnover, consumer welfare effects, etc.)*
- *The impact of the standards on the automobile industry*

While EPA's emission regulations under the Clean Air Act serve an important purpose, they currently overshadow the original reason that Congress created the CAFE program in 1975: to reduce America's dependence on the petroleum fuels. The Energy Policy and Conservation Act was a direct response by lawmakers to the catastrophic economic and geopolitical effects of the 1973 oil crisis, but this purpose should also be fresh in the minds of today's policymakers and regulators. Like virtually every other economic recession, the oil price spike of 2007 is widely regarded as triggering the Great Recession in 2008, which devastated the global economy and cost over a hundred thousand jobs in the automotive sector as Chrysler and GM went into bankruptcy.[47]

Much more recently, Hurricane Harvey's devastation seriously disrupted the nation's gasoline fuel supplies[48] – a reminder (along with Superstorm Sandy in 2012[49]) that our dependency on one fuel source poses inherent risks beyond political or economic events.

[47] James Hamilton, "Oil Prices and the Economic Downturn." Testimony Prepared for the Joint Economic Committee of the U.S. Congress (May 20, 2009), https://www.jec.senate.gov/public/_cache/files/a6fca8ca-4c4f-4006-bca5-67e972dc19e2/hamilton-testimony.pdf

[48] Gaurav Sharma, *Hurricane Harvey Has Morphed Into A Major U.S. Gasoline Supply Disruption Event*, FORBES (August 28, 2017), https://www.forbes.com/sites/gauravsharma/2017/08/28/hurricane-harvey-has-morphed-into-a-major-u-s-gasoline-supply-disruption-event/#319555b72872

VNG

The U.S. shale oil boom of recent years, while welcome, does not change this near-total dependence on petroleum fuels, nor the associated vulnerabilities. Despite increased production and exports, we still import nearly half of the oil consumed in this country.[50] Moreover, regardless of the degree of oil imports, the TAR acknowledges that "the price impacts of an oil disruption anywhere will continue to be transmitted to U.S. markets"[51] because oil is a global commodity. And Middle East and North African countries – which have triggered 8 of the 10 oil price shocks in history, and face significant threats from the rise of ISIS and Saudi/Iranian tensions – still account for 30% of global production, a share that the TAR expects to rise.[52]

Despite this ever-present danger hanging over our country, and despite the original intent of the CAFE rules, the TAR chapter on energy security acknowledges that the present regulations will barely make a dent in this dependence. In 2025, the TAR projects that U.S. oil imports will be reduced by 169,000 barrels a day thanks to the rules – less than 6% of imports, which will continue to *rise*, not fall. And with sales of EVs and FCVs projected to be less than 2% of the total market as late as 2030[53] - and NGV sales not projected at all – there is no expectation for alternative fuels to break oil's stranglehold on the transportation sector.

This does not have to be the case. As discussed in previous sections, NGVs are a proven, feasible solution for petroleum-free transportation, with 22 million on the road worldwide and currently-untapped potential for mass-market adoption here in America. In terms of a resource base, the shale gas revolution has created an enormous supply of domestic fossil natural gas supplies, and potential sources of RNG are found in communities and farms across the country. With this combination of a market-ready technology and an abundant, cleaner fuel supply, there is no reason for regulators to give up and resign the country to an oil-dependent future.

This is why restoring the "0.15 divisor" calculation for NGV emissions and removing other unreasonable restrictions on NGV incentives, as discussed earlier in these comments, is so important: not only is it justified based on the game-changing environmental benefits of RNG, but it also returns the joint EPA/NHTSA program to Congress's original purpose in passing the Energy Policy and Conservation Act as well as the Alternative Motor Fuels Act. By effectively removing Congress's CAFE incentives for NGVs, the current EPA rules create a conflict between environmental progress and America's energy security that does not need to exist.

Summary and Recommendations

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[49] Kate Zernike, *Gasoline Runs Short, Adding Woes to Storm Recovery,* N.Y. TIMES (Nov 1, 2012) http://www.nytimes.com/2012/11/02/nyregion/gasoline-shortages-disrupting-recovery-from-hurricane.html?pagewanted=all

[50] *How much petroleum does the United States import and export?* ENERGY INFORMATION ADMINISTRATION (April 4, 2017). https://www.eia.gov/tools/faqs/faq.php?id=727&t=6

[51] Draft TAR, 10-22

[52] *Id.*

[53] *Id.,* 13-64

VNG

The current rules fail to meaningfully address the massive risks to America's economic prosperity and security posed by our near-total dependence on petroleum fuels in transportation. NGVs have unsurpassed potential to provide a practical solution to this dependence, but the current EPA rules effectively undercut the original Congressional intent of the CAFE program and later Congressional incentives for NGVs by eliminating the "0.15 divisor" from emission calculations.

- The potential for NGVs to provide a mass-market solution for petroleum dependence is one more reason for pursuing the comprehensive agenda of reform for NGV regulations discussed in these comments – and making these reforms effective immediately.

NGV Reform Needed Today for 2017-2021 Targets

Issues Addressed:

- *Whether the light-duty vehicle greenhouse gas standards established for model year 2021 are appropriate.*

In addition to the MTE's original focus on the 2022-2025 standards, EPA has also requested comments on whether the standards for 2021 remain appropriate. As with the 2025 targets, we believe that automakers can indeed deliver these reductions in emissions as well as petroleum consumption – but only if they are provided with appropriate incentives that recognize the contributions that NGVs make to these goals.

For all of the reasons discussed in previous sections, we believe that the challenges of meeting the targets without NGVs pose a fundamental threat to the economic viability of U.S. automakers, and thus to the hundreds of thousands of jobs that they support. And, while this challenge is likely to become dire by 2025, it is likely that it will begin impacting automakers sooner, and potentially within the 2017-2021 timeframe. Moreover, automakers will need time to ramp up their production of NGVs, and infrastructure developers like VNG will similarly need time to build fueling networks to serve the light-duty market.

Thus, EPA's desire to review the 2021 targets is an excellent opportunity to make the recommended reforms to NGV incentives sooner, rather than waiting until 2022-2025. By reforming NGV incentives effective immediately, the industry will have the regulatory certainty needed to make these long-term investments and get to work right away. Given the importance of reducing the risks of petroleum dependence to our environment and the economy, there is simply no reason to wait.

Summary and Recommendations

Because the current disparity between the treatment of NGVs and EVs is so clearly arbitrary and contrary to real-world lifecycle GHG emissions, and because automakers need this compliance flexibility and regulatory certainty in order to confidently invest in NGV production, a reform of NGV incentives should be made effective immediately – without waiting for the 2022-

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2025 period. EPA's review of the 2021 targets as part of this proceeding is an opportunity to do so.

- In the process of reviewing the 2021 targets, the agencies should adopt the recommended changes to NGV incentives discussed in these comments effective immediately.

Conclusion and Summary of Recommendations

Discussions of the future of automotive emissions are too often characterized by pessimism from all sides. On one hand, environmentalists have pushed for a widespread adoption of EVs that the EPA's own projections (e.g. the TAR) show is decades away, with very limited penetration projected through 2025. On the other hand, the auto industry argues that it has no way to keep consumers from buying larger and more-polluting vehicles, nor any way to cost-effectively reduce their emissions. And those hoping for an end to the U.S.'s decades-long vulnerability to shocks from global oil markets have little hope at all.

This picture is so gloomy because NGVs are wrongly absent from the conversation. Proven, practical NGV technology and RNG fuel can benefit light truck drivers and the environment in the near term at competitive costs, and next-generation NGVs - with high-octane engines fueled by both RNG and hydrogen-enriched gas - have the potential to dramatically improve the trajectory of these vehicles for decades to come. And with America's unrivaled gas resources, NGVs also have the potential to finally break our near-total dependence on petroleum-based fuels with an affordable, cleaner, domestically-abundant fuel.

The MTE is a critical opportunity for the agencies to correct this glaring oversight. By seriously studying the promise of NGVs and by including a robust suite of incentives for their deployment comparable to those provided to EVs, the agencies can offer a compromise to please all sides. The existing targets for 2025 can be maintained as environmentalists wish; automakers can have an expanded set of compliance pathways that address their area of biggest need - light trucks and full-size pickups; and individual consumers get the vehicles they want and need while reducing petroleum dependence and environmental impacts at a reasonable cost.

In doing so, the agencies can deliver a win-win-win for America in line with the "pro-environment, pro-growth" philosophy espoused by this Administration.[54] VNG looks forward to working with the agencies as the MTE process continues to create a final rule that reduces emissions and petroleum dependence while boosting the domestic economy through maximizing our country's unsurpassed traditional fossil and renewable natural gas resources.

[54] *EPA chief: Trump's energy order sends 'pro-growth, pro-environment message'*, FOX NEWS (Mar. 29, 2017), http://www.foxnews.com/politics/2017/03/29/epa-chief-trumps-energy-order-sends-pro-growth-pro-environment-message.html.

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As a final summary, we recommend the following changes to the rules:

- NGV emissions calculations should return to the "0.15" divisor effective immediately, with emissions calculated as 85% below a gasoline vehicle. This is both justified by the real-world emissions benefits of RNG and is consistent with the CAFE program. The potential for future improvements to NGV emissions from advanced engine technologies, as well as synergies with hydrogen FCVs, provides further justification for this incentive.
    - We recommend reinstating language from the MY 2011-2016 regulations under 40 C.F.R. § 600.510–12, *Calculation of average fuel economy and average carbon-related exhaust emissions*: "For natural gas-fueled model types . . . the carbon-related exhaust emissions value calculated for that model type in accordance with paragraph (b)(2) of this section multiplied by 0.15 and rounded to the nearest gram per mile, except that manufacturers complying with the fleet averaging option for N_2O and CH_4 as allowed under § 86.1818 of this chapter must perform this calculation such that N_2O and CH_4 values are not multiplied by 0.15."
- Offer a "Natural Gas Pickup" incentive similar to current hybrid-electric and "performance-based" pickup credits; however, for the natural gas pickup credit, minimum deployment thresholds should be eliminated to reflect the greater market challenges faced by NGVs - since, unlike hybrid-electrics, they use an alternative fuel.
    - This goal could be accomplished by inserting a new section (c) under 40 C.F.R. § 86.1870–12, *CO_2 credits for qualifying full-size pickup trucks*, titled "Credits for implementation of natural gas technology." The structure of these credits would be similar to those for sections (a) and (b), but with reduced or eliminated requirements for the "required minimum percent of full size pickup trucks."
- Remove the utility factor requirements for a 2:1 ratio of CNG-to-gasoline range, as well as the requirement for dual-fuel NGVs to only use gasoline when the CNG tank is empty.
    - This could be achieved by deleting the requirements in 40 C.F.R. § 600.510–12, *Calculation of average fuel economy and average carbon-related exhaust emissions*, part (c)(2)(vii)(B) for fuel economy and (j)(2)(vii)(B) for emissions.
- Incorporate the potential for use of natural gas when setting targets for practical, achievable emissions improvements for light trucks and full-size pickups. Modeling used to set achievable emissions curves for pickups and light trucks should include natural

gas as a proven technology at costs based on high-volume adoption, not their current incremental costs at low production volumes.

- Allow EPA-certified converters to "opt in" to the program and generate credits for CNG retrofits and upfits that can subsequently be sold to automakers.

- Provide emission credits for CNG "prep packages" that reduce the costs of subsequent conversion to natural gas, as part of the off-cycle credit technologies listed at 40 C.F.R. § 86.1869–12, *CO_2 credits for off-cycle CO_2-reducing technologies.*

Respectfully submitted,

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908-447-4201

6560-60-P

ENVIRONMENTAL PROTECTION AGENCY

[EPA–HQ–OAR–2015–0827; FRL-nnnn-nn-OAR]

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

[NHTSA-2016-0068]

Request for Comment on Reconsideration of the Final Determination of the Mid-term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light-duty Vehicles; Request for Comment on Model Year 2021 Greenhouse Gas Emissions Standards

AGENCY: Environmental Protection Agency (EPA) and Department of Transportation's (DOT) National Highway Traffic Safety Administration (NHTSA).

ACTION: Notice; Request for Comment.

SUMMARY: In a March 22, 2017, *Federal Register* notice, the Environmental Protection Agency (EPA) announced its intention to reconsider the Final Determination of the Mid-term Evaluation of greenhouse gas emissions standards for model year 2022-2025 light-duty vehicles and to coordinate its reconsideration with the parallel rulemaking process to be undertaken by the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) regarding Corporate Average Fuel Economy (CAFE) standards for cars and light trucks for the same model years. In this notice, EPA is announcing that it is reconsidering whether the light-duty vehicle greenhouse gas standards previously established for model years 2022-2025 are

appropriate under section 202(a) of the Clean Air Act and invites stakeholders to submit any comments, data, and information they believe are relevant to the Administrator's reconsideration of the January 2017 Mid-term Evaluation Final Determination and in particular, highlight any new information. As part of a 2012 joint final rulemaking by the EPA and NHTSA, the Mid-term Evaluation process was codified in EPA regulation for greenhouse gas emission standards for model years 2017-2025 light-duty vehicles, which requires EPA to determine no later than April 1, 2018, whether the standards for model years 2022-2025 are appropriate.[1] In accord with this schedule, as noted in the March 22, 2017, notice and today's notice, EPA intends to make a Final Determination regarding the appropriateness of the model year 2022-2025 standards no later than April 1, 2018. In today's notice, EPA is also requesting comment on the separate question of whether the light-duty vehicle greenhouse gas standards established for model year 2021 remain appropriate, regardless of the agency's decision on the MTE.

DATES: Comments on must be received on or before **[Insert date 45 days after publication in the FEDERAL REGISTER]**. EPA will announce the public hearing date and location for this notice in a supplemental Federal Register notice.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA-HQ-OAR-2015-0827 to the Federal eRulemaking Portal: http://www.regulations.gov. Follow the online instructions. Once submitted, your submittal cannot be edited or withdrawn. The EPA may publish any submittals received to its public docket. Do not submit electronically to the docket any information you consider to be Confidential Business Information (CBI) or other information

[1] 40 CFR 86.1818-12(h); *see also* 77 FR 62624 (October 15, 2012).

whose disclosure is restricted by statute. Multimedia submissions (audio, video, etc.) must be accompanied by a written submittal. The written comment is considered the official comment and should include discussion of all points you wish to make. The EPA will generally not consider comments or comment contents located outside of the primary submission (i.e. on the web, cloud, or other file sharing system). Contact the contact person listed below if you would like to provide CBI to the agency for consideration. For additional submission methods, the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit http://www2.epa.gov/dockets/commenting-epa-dockets.

FOR FURTHER INFORMATION CONTACT: Christopher Lieske, Office of Transportation and Air Quality (OTAQ), Assessment and Standards Division (ASD), Environmental Protection Agency, 2000 Traverwood Drive, Ann Arbor MI 48105; telephone number: (734) 214-4584; email address: [HYPERLINK "mailto:lieske.christopher@epa.gov"] fax number: 734-214-4816; and Rebecca Schade, Office of the Chief Counsel, National Highway Traffic Safety Administration, 1200 New Jersey Avenue SE., Washington, DC 20590; telephone: (202) 366-2992.

SUPPLEMENTARY INFORMATION:

I. Public Participation

Materials related to the Mid-term Evaluation are available in the public docket noted above and at https://www.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-ghg-emissions.

1. How Do I Prepare and Submit Information?

Direct your submittals to Docket ID No EPA-HQ-OAR-2015-0827. EPA's policy is that all submittals received will be included in the public docket without change and may be made available online at www.regulations.gov, including any personal information provided, unless the submittal includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute.

Do not submit information to the docket that you consider to be CBI or otherwise protected through www.regulations.gov. The www.regulations.gov web site is an "anonymous access" system, which means EPA will not know your identity or contact information unless you provide it in the body of your submittal. If you submit an electronic submittal, EPA recommends that you include your name and other contact information in the body of your submittal and with any disk or CD–ROM you submit. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses. For additional information about EPA's public docket visit the EPA Docket Center homepage at http://www.epa.gov/epahome/dockets.htm.

EPA will also hold a public hearing on this notice. We will announce the public hearing date and location in a supplemental Federal Register notice.

2. Submitting CBI

Do not submit this information to EPA through www.regulations.gov or e-mail. Clearly mark the part or all of the information that you claim to be CBI. For CBI information in a disk or CD ROM that you mail to EPA, mark the outside of the disk or CD ROM as CBI and then identify electronically within the disk or CD ROM the specific information that is claimed as CBI). In

addition to one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket. Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2.

3. Tips for Preparing Your Comments

When submitting comments, remember to:

- Identify the rulemaking by docket number and other identifying information (subject heading, Federal Register date and page number).
- Explain why you agree or disagree; suggest alternatives and substitute language for your requested changes.
- Describe any assumptions and provide any technical information and/or data that you used.
- If you estimate potential costs or burdens, explain how you arrived at your estimate in sufficient detail to allow for it to be reproduced.
- Provide specific examples to illustrate your concerns, and suggest alternatives.
- Explain your views as clearly as possible, avoiding the use of profanity or personal threats.
- Make sure to submit your comments by the comment period deadline identified in the DATES section above.

II. Additional Information

In a March 22, 2017, *Federal Register* notice, the Environmental Protection Agency announced its intention to reconsider the Final Determination of the Mid-term Evaluation of greenhouse gas emissions standards for model year 2022-2025 light-duty vehicles and to coordinate its reconsideration with the parallel rulemaking process to be undertaken by the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) regarding Corporate Average Fuel Economy (CAFE) standards for cars and light trucks for the same model years.[2] In this notice, EPA is announcing that it is reconsidering whether the light-duty vehicle greenhouse gas standards previously established for model years 2022-2025 are appropriate under section 202(a) of the Clean Air Act and invites stakeholders to submit any comments, data, and information they believe are relevant to the Administrator's reconsideration of the Final Determination and in particular, highlight any new information. As part of a 2012 joint final rulemaking by the EPA and NHTSA, the Mid-term Evaluation process was codified in EPA regulation for greenhouse gas emission standards for model years 2017-2025 light-duty vehicles, which requires EPA to determine no later than April 1, 2018, whether the standards for model years 2022-2025 are appropriate.[3] In November 2016, EPA issued a proposed determination for the Mid-Term Evaluation.[4] On January 12, 2017, the EPA Administrator signed the Final Determination of the Mid-Term Evaluation.

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[2] 82 FR 14671.

[3] 77 FR 62624 (October 15, 2012). NHTSA is statutorily required to conduct a de novo rulemaking on MY 2022 to 2025 standards for light-duty vehicles. NHTSA has recently taken the first step in this process by publishing the "Notice of Intent To Prepare an Environmental Impact Statement for Model Year 2022–2025 Corporate Average Fuel Economy Standards" on July 26, 2017.

[4] 81 FR 87927 (Dec. 6, 2016).

Some stakeholders previously commented that they were preparing studies to inform the Mid-term Evaluation that were not ready for submission during the previous Mid-term Evaluation comment periods. This additional comment period provides an opportunity for commenters to submit to EPA additional studies and other materials as well as to complete the preparation of their comments, or submit additional comments in light of newly available information. There is an existing body of EPA analyses and public comments already in the docket. Please note that the agency is primarily interested in comments relevant to the reconsideration of the Final Determination, rather than the Technical Assessment Report (TAR), which is not being reopened for comment in this notice. Additionally, NHTSA has been working closely with stakeholders to develop its forthcoming rulemaking since the March 2017 joint notice with EPA, and encourages commenters wishing to inform those efforts to directly participate in NHTSA's rulemaking process.

EPA's reconsideration will be conducted in accordance with the regulations EPA established for the Mid-term Evaluation at 40 CFR 86.1818-12(h). These regulations state that in making the required determination as to whether the existing standards are appropriate under section 202(a) of the Clean Air Act, the Administrator shall consider the information available on the factors relevant to setting greenhouse gas emission standards under section 202(a) of the Clean Air Act for model years 2022 through 2025, including but not limited to:

- The availability and effectiveness of technology, and the appropriate lead time for introduction of technology;

- The cost on the producers or purchasers of new motor vehicles or new motor vehicle engines;
- The feasibility and practicability of the standards;
- The impact of the standards on reduction of emissions, oil conservation, energy security, and fuel savings by consumers;
- The impact of the standards on the automobile industry;
- The impacts of the standards on automobile safety;
- The impact of the greenhouse gas emission standards on the Corporate Average Fuel Economy standards and a national harmonized program; and
- The impact of the standards on other relevant factors.[5]

Pursuant to 40 CFR 86.1818-12(h)(1)(viii), EPA also invites comments on the following other factors relevant to setting greenhouse gas emission standards under section 202(a) of the Clean Air Act for model years 2022 through 2025:

- The impact of the standards on compliance with other air quality standards;
- The extent to which consumers value fuel savings from greater efficiency of vehicles;
- The ability for OEMs to incorporate fuel saving technologies, including those with "negative costs," absent the standards;

[5] 40 CFR 86.1818-12(h)(1).

- The distributional consequences on households;
- The appropriate reference fleet;
- The impact of the standards on advanced fuels technology, including but not limited to the potential for high-octane blends;
- The availability of realistic technological concepts for improving efficiency in automobiles that consumers demand, as well as any indirect impacts on emissions;
- The advantages or deficiencies in EPA's past approaches to forecasting and projecting automobile technologies, including but not limited to baseline projections for compliance costs, technology penetration rates, technology performance, etc.;
- The impact of the standards on consumer behavior, including but not limited to consumer purchasing behavior and consumer automobile usage behavior (e.g. impacts on rebound, fleet turnover, consumer welfare effects, etc.); and
- Any relevant information in light of newly available information.

In addition, EPA seeks comment on the use of alternative methodologies and modeling systems to assess both analytical inputs and the standards, including but not limited to the Department of Energy's (DOE's) Argonne National Laboratory's Autonomie full vehicle simulation tool and DOT's CAFE Compliance and Effects Model.

In accord with the schedule set forth in its regulations, the EPA intends to make a Final Determination regarding the appropriateness of the model year 2022–2025 greenhouse gas

standards, and potentially the model year 2021 greenhouse gas standard, no later than April 1, 2018.

In today's notice, in the interest of harmonization between the GHG and CAFE programs, EPA is also requesting comment on the separate question of whether the light-duty vehicle greenhouse gas standards established for model year 2021 are appropriate. In its July 26, 2017, "Notice of Intent To Prepare an Environmental Impact Statement for Model Year 2022–2025 Corporate Average Fuel Economy Standards," NHTSA stated that as part of its upcoming CAFE rulemaking, it may evaluate the model year 2021 standards it finalized in 2012 to ensure they remain "maximum feasible" (See 82 FR 34742). Please provide comment on the continued appropriateness of the model year 2021 GHG standards based on the application of the factors described above or any other factors that commenters believe are appropriate.

Dated: _____

_____

E. Scott Pruitt,

Administrator.

_____

Elaine L. Chao,

Secretary

Message

From: David Schwietert [DSchwietert@autoalliance.org]
Sent: 8/1/2017 1:41:18 PM
To: Catanzaro, Michael J. EOP/WHO [Ex. 6 Personal Privacy (PP)]
CC: Bolen, Brittany [bolen.brittany@epa.gov]; Dravis, Samantha [dravis.samantha@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Loren Smith (loren.smith@dot.gov) [loren.smith@dot.gov]; Owens, James (OST) [j.owens@dot.gov]
Subject: Mitch Bainwol Presentation in Michigan later today - Auto outlook and MTR/CAFE

Mike,

Hope you are well.

Pasted below is the 40 slide Powerpoint that Mitch will be using later today at the CAR Management Briefing Seminar that's taking place in Traverse City, Michigan through August 3rd. I wanted to pass this along to you and others due to on-going work regarding the Mid Term Review for auto fuel economy standards.

- https://spaces.hightail.com/receive/X0YF6AJuHC/c2hhbGxAYXV0b2FsbGlhbmNlLm9yZw==

In particular, Mitch will take part in an afternoon session Titled: "Fuel Economy and Greenhouse Gas Emissions: Where does Policy go now? And, will the Market Follow?"
The afternoon panel includes a host of auto sector speakers, including Chris Grundler from EPA and Annette Hebert from CARB.

The information in Mitch's presentation includes updated polling on consumer behaviors regarding automobiles and fuel economy, autonomous vehicles, car sharing and safety. Because of the event's focus on fuel economy, I suspect some of his remarks could be included in news articles later today.

I would draw your attention to slide 34 which underscores for discussion purposes the very narrow difference between the projected fuel economy numbers starting in MY 2022 versus what was projected in the Joint Final Rule in 2012. These projections are strictly for discussion purposes and aren't part of any formal recommendations from the Alliance or our members. However, I think you will see the narrow difference in fuel savings should there be an alteration in overall fuel economy as the Administration reviews the EPA's hastily prepared GHG Final Determination and as NHTSA/DOT works on a future NPRM for CAFE Standards for MY 2022-2025.

Also, slide 38-39 are also worth taking a look at since reporters are likely to focus on why there's a benefit for the auto sector, the federal government and California to find a "deal" that alters the previously anticipated compliance requirements due to a host of factors (cost, technology, consumer acceptance, etc) that we feel weren't adequately evaluated as part of the Mid Term Review.

Please let me know if you have any questions.

Thanks,

Dave

David Schwietert
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Curious to know how the Auto sector impacts your state or district -- Click here. To get a better understanding of how America's automobile industry is one of the most powerful engines driving the U.S. economy, click here.

Message

From: David Schwietert [DSchwietert@autoalliance.org]
Sent: 4/3/2018 4:51:19 PM
To: Letendre, Daisy [letendre.daisy@epa.gov]; Jackson, Ryan [jackson.ryan@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Bolen, Brittany [bolen.brittany@epa.gov]; Harlow, David [harlow.david@epa.gov]; Konkus, John [konkus.john@epa.gov]
CC: Gloria Bergquist [GBERGQUIST@autoalliance.org]
Subject: Auto Alliance Follow up
Attachments: Increasing EPA Fuel Economy.pdf

Team EPA,

Thanks again for including us in today's press event. The Administrator did a nice job outlining why this decision is warranted, as well as next steps with NHTSA.

I wanted to pass along the chart that Mitch referenced in case it would be useful for the Administrator or others.

Talk soon,

Dave

From: David Schwietert
Sent: Tuesday, April 03, 2018 9:08 AM
To: 'Letendre, Daisy' <letendre.daisy@epa.gov>; 'Jackson, Ryan' <jackson.ryan@epa.gov>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>; 'bolen.brittany@epa.gov' <bolen.brittany@epa.gov>; 'harlow.david@epa.gov' <harlow.david@epa.gov>
Subject: RealClearPolitics commentary by Bainwol

FYI

From: Gloria Bergquist
Sent: Tuesday, April 03, 2018 9:05 AM
To: bowman.liz@epa.gov
Cc: Amy Dewey <dewey.amy@epa.gov>; David Schwietert <DSchwietert@autoalliance.org>
Subject: RealClearPolitics commentary by Bainwol

Liz, here is Mitch's op ed that is online now. Gloria

https://www.realclearpolitics.com/articles/2018/04/03/revisiting_of_fuel_standards_is_not_a_rollback_136688.html

Revisiting of Fuel Standards Is Not a Rollback

COMMENTARY

By Mitch Bainwol
April 03, 2018

Washington is a town where truth can be elusive. Ideological agendas and herd reporting often distort issues. When it comes to auto policy, especially in today's highly charged political environment, sensationalism routinely warps reality. Here's an example:

Contrary to the breathless coverage of the Trump administration's action to revisit fuel economy and greenhouse gas emission standards, this decision actually fulfills key promises made by the prior administration. Early in Barack Obama's first term in office, automakers agreed with the president to establish long-term fuel economy targets stretching out to 2025. This bold plan, requiring massive investment by automakers to achieve a social goal we embraced -- addressing climate change -- came with two prudent obligations by policymakers.

First, President Obama and his team committed to undertake a midterm review halfway through the timeframe (2018) to check government predictions against reality and use that information to set standards for 2022-2025. The midterm look-back recognized the challenge of forecasting market and technology factors long into the future, as well as the importance of using evidence-based analysis because the economic stakes were so significant.

Second, policymakers made a commitment to harmonize three regulatory programs that effectively serve the same purpose – managing fuel efficiency/carbon. National Highway Traffic Safety Administration, EPA and California's Air Resources Board all regulate emissions, but in different ways and with different timelines. Redundant government programs drive compliance costs up and that ultimately comes out of the wallets of our customers. The Obama administration stated in writing: "Continuing the National Program ensures that auto manufacturers can build a single fleet of U.S. vehicles that satisfy requirements of both federal programs as well as California's program."

Both of these commitments made sense. The agreement was sound. The goals were shared. And the plan was launched. But something funny happened on the way to the forum.

After the 2016 election, EPA chose to short-circuit the midterm analysis and advance a finding nearly 18 months before it was due. Politics took hold; marketplace realities were ignored. The federal program itself was split, with EPA jumping ahead of NHTSA. The original estimated targets were then justified and rushed through, irrespective of contradictory but salient market developments and irrespective of NHTSA's role in the process. Both commitments – the midterm and One National Program – were abrogated.

The market reality is clear. No factor is more relevant than gas prices, which remain significantly lower than projected. In reaction, consumers are buying more SUVs and trucks, bigger engines and fewer alternative powertrains than regulators expected. When the EPA issued the premature determination early last year, it trumpeted the statistic that automakers were over-complying. Weeks later, government reports indicated that statistic was no longer operative, and, for the first time, automakers missed the emissions targets despite achieving record fuel economy. Since then, compliance has slipped even further.

Remember, the government evaluates automakers on fuel economy standards by what consumers buy – not what automakers put in dealer showrooms. In short, the buying pattern of the American public has demonstrated that a rigid adherence to the standards -- as originally contemplated nearly a decade ago -- is inconsistent with market realities.

Moreover, two or three different regulatory rule sets make no sense. As such, we enthusiastically embrace the idea of One National Program. We did so when we signed up in 2011. We did so in the days immediately after the 2016 election and we do so now. Nothing has changed. Writing to the Trump transition team in November of 2016, we asked that "the White House lead efforts with EPA, NHTSA, CARB and the automakers on finding a pathway forward regarding the standards for 2022 MY and beyond."

Here we are, in April of 2018, the precise point at which the previous administration suggested a judgment be reached about whether to adjust the standards. The new administration has spent a year conducting research, looking at the unfolding data – and has reached the determination that adjustments are warranted.

"Adjustments" are not rollbacks. We favor standards that increase year over year. The industry is committed to ongoing progress in a journey that has no end date. After all, we have invested substantially in energy-efficient technologies that we would like to see consumers embrace. We expect that fuel economy will keep rising. The only issue is at what speed. We do not buy the view that the 2012 projections were perfect and that conditions are unchanged. On the contrary, the projections were materially imperfect and conditions have fundamentally changed.

Even so, no matter how these standards ultimately adjust, the fuel savings through 2025 will likely achieve at least 97 percent of the original estimates. That's because there is profoundly more savings realized on the front end of the curve than on the back end – as moving from 10 to 20 miles per gallon produces 10 times more savings than moving from 40 to 50 miles per gallon.

We asked administration officials to look at the data and base their decision on marketplace realities. They have. We asked them to work with California to try to find a policy outcome that works for both. They are embarked on that mission. Let's give that a try. Too much is at stake to let politics and overheated rhetoric get in the way.

Mitch Bainwol is president and CEO of the Auto Alliance, the leading automotive advocacy group composed of 12 automakers.

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Vice President, Communications and Public Affairs

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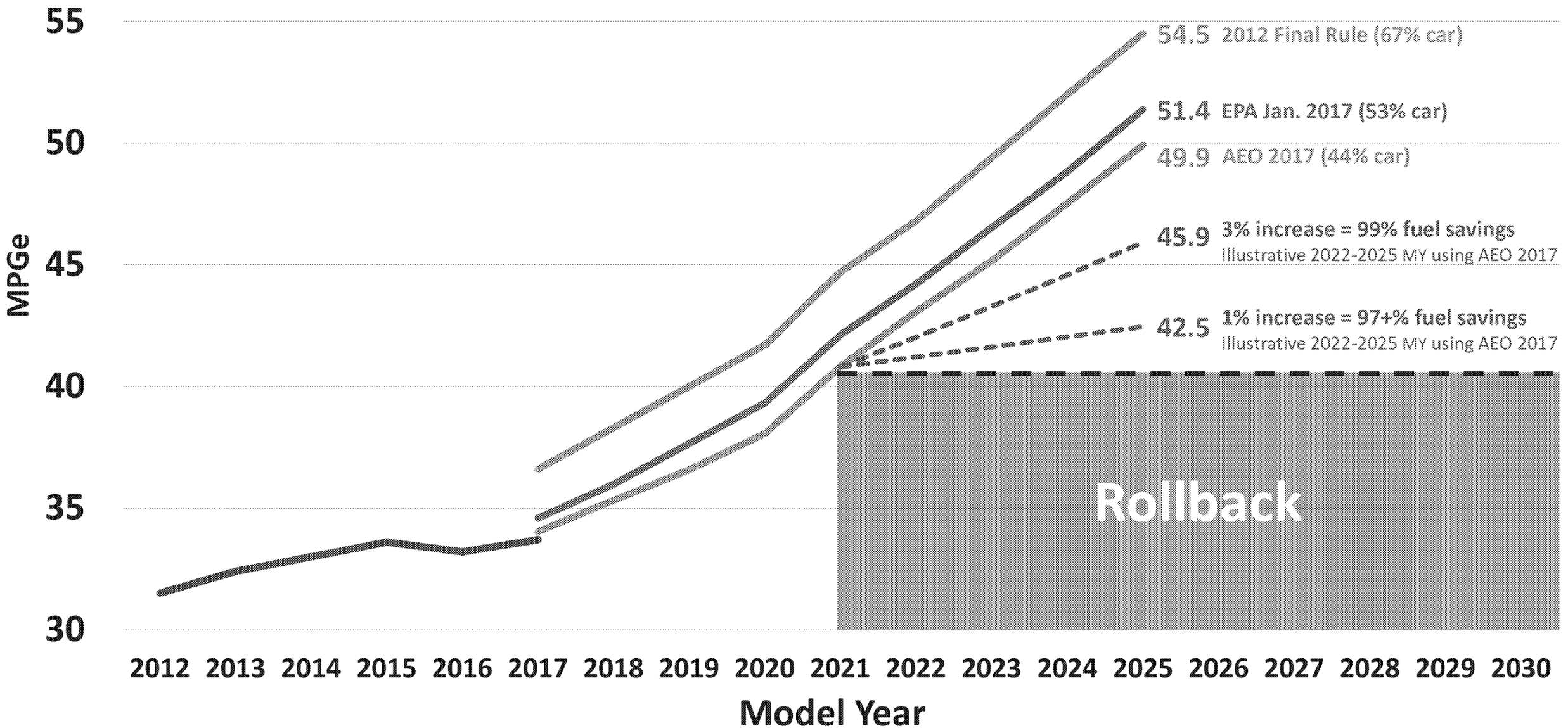
Increasing EPA Fuel Economy



Message

From: Tucker, Jamie [jtucker@AKINGUMP.COM]
Sent: 12/7/2017 8:37:58 PM
To: Bolen, Brittany [bolen.brittany@epa.gov]; Feeley, Drew (Robert) [Feeley.Drew@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Letendre, Daisy [letendre.daisy@epa.gov]
Subject: RE: Natural Gas Vehicles As An Alternative Compliance Pathway
Attachments: NACS SIGMA Letter to EPA NHTSA on NGVs.pdf

Flag: Follow up

Team - I wanted to share with you the comments recently filed by the National Association of Convenience Stores (NACS) and the Society of Independent Gasoline Marketers of America (SIGMA) which describe the regulatory incentives and requirements of the current GHG emissions standards as "disproportionately favor[-ing]" electric vehicles and furthers calls on EPA and NHTSA to create a level playing field for light duty NGVs and EVs in the Mid-Term Evaluation.

Additionally, we wanted to share that we met with CARB last month and are also scheduled to have a call on the 14th with William Charmley and Michael Olewchiw from OTAQ in Ann Arbor to walk them through the technical analysis of VNG.Co's proposals around NGV parity (summarized below).

Would you be available for a call during the week of the 18th with the team from VNG.Co for an update?

Thanks

Jamie

From: Tucker, Jamie
Sent: Monday, October 23, 2017 3:46 PM
To: 'bolen.brittany@epa.gov'; 'feeley.drew@epa.gov'
Cc: 'letendre.daisy@epa.gov'
Subject: Natural Gas Vehicles As An Alternative Compliance Pathway

Brittany/ Drew - We want to express our great appreciation for your time today with VNG and Ariel to discuss ways to harmonize regulatory treatment of NGVs and EVs.

As we discussed, VNG is proposing regulatory changes which would address (among other segments) the light-duty truck category which accounts for 64% of new vehicle purchases (and are responsible for even greater amounts of fuel use and pollution if you take into account the differential in fuel economy between light-duty trucks and passenger cars), and for which there is not a viable electrification solution.

Natural gas vehicles provide a cost effective and additional pathway for automaker emissions compliance while preserving the products consumers desire, and are therefore worthy of being included in a portfolio of solutions along with EVs to achieve the objectives.

Specifically, we would encourage the Administration to consider:

- **Restoring the 0.15 "divisor"** in EPA's compliance calculations, equivalent to NHTSA's statutory Petroleum Equivalency Factor that counts a gallon-equivalent of natural gas as 0.15 gallons of gasoline. The previous Administration ended this powerful incentive while simultaneously providing electric vehicles with additional emissions incentives on the hope that EVs would be "game changers." The game has now changed for NGVs. The

shale revolution that has occurred since the current rules were set as well the development of Renewable Natural Gas as the lowest carbon vehicle fuel are true game changers that strongly justify returning to the 0.15 divisor.

The powerful and well-justified incentive of the 0.15 divisor would be complemented and made even more effective by additional changes including:

- **Eliminating range requirements on bi-fuel NGVs** that results in an impractical natural gas tank size requirement that is twice the size of the gasoline tank and costly design requirements for NGVs, whereas no such range requirements exists for hybrid electric vehicles. This is the most important regulatory change as a complement to the 0.15 divisor of the three.

- **Providing NGV pick-ups with the bonus credits** provided to "strong electric hybrid pick-ups" and **eliminating the existing minimum 10% deployment threshold** to qualify for pickup bonus credits.

- **Establishing a new incentive to encourage retrofitting existing gasoline and diesel vehicles to run on natural gas**, something that isn't feasible for electric drives but which will reduce emissions by the existing fleet of vehicles

Enclosed for your further consideration are our Midterm Evaluation comments as well as information outlining the rationale for the recommended regulatory changes. We stand at the ready to respond to any questions or recommendations you may have with regard to our MTE recommendations and comments.

Thank you again and we look forward to continuing our dialogue with you and others engaged in the inter-agency process.

Jamie

Jamie Tucker
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Steptoe
STEPTOE & JOHNSON LLP

November 21, 2017

The Honorable Scott Pruitt
Administrator
Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, D.C. 20460

The Honorable Elaine Chao
Secretary
Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

RE: Reconsideration of Final Determination of the Mid-term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light-duty Vehicles; Model Year 2021 Greenhouse Gas Emissions Standards [NHTSA-2016-0068; EPA-HQ-OAR- 2015-0827; FRL-9966-62-OAR]

Dear Administrator Pruitt and Secretary Chao,

Our clients, the National Association of Convenience Stores ("NACS") and the Society of Independent Gasoline Marketers of America ("SIGMA")(collectively "the Associations"), offer these comments in response to the Environmental Protection Agency's ("EPA") and the National Highway Traffic Safety Administration's ("NHTSA")(collectively "the Agencies") reconsideration of its Final Determination of the Mid-term Evaluation of Greenhouse Gas ("GHG") Emissions Standards for Model Year 2022-2025 Light-duty Vehicles.[1] As the Agencies formulate emissions targets for 2022-2025 model year pickups and other light trucks, NACS and SIGMA urge you to treat light-duty natural gas vehicles ("NGVs") as equivalent to electric vehicles ("EVs"). The Associations do not believe that valuative criteria should be manipulated to push a single technology (or policy), such as electric vehicle technology. As a consequence, the Associations support treating NGVs on par with EVs and believe this principle should apply universally to any technology that demonstrates the necessary emissions outcomes.

Regulatory incentives and requirements built into current GHG emissions standards disproportionately favor EV technology over NGVs. Yet, evidence shows that the emissions

[1] Department Of Transportation, National Highway Traffic Safety Administration, Environmental Protection Agency, Request for Comment, *Reconsideration of the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022–2025 Light-Duty Vehicles;* Request for Comment, *Model Year 2021 Greenhouse Gas Emissions Standards*, 82 Fed. Reg. 160 (August 21, 2017), *available at* https://www.gpo.gov/fdsys/pkg/FR-2017-08-21/pdf/2017-17419.pdf.

benefits from NGVs are equal to those of EV technology. Thus, there is no reason to favor one efficient emissions technology over another. Parity in incentives for NGVs and EVs would encourage automakers to transition light-duty vehicle segments to compressed natural gas ("CNG"), and including NGVs in the formulation of GHG emissions targets for 2022-2025 model year light-duty vehicles could increase EPA's estimates of achievable emissions and fuel economy improvements, which would weigh in favor of maintaining existing emissions reduction targets. NACS and SIGMA urge the Agencies to change existing regulatory incentives and dual-fuel vehicle design requirements to create a level playing field for light-duty natural gas vehicles and electric vehicles. In addition to the detailed comments provided below, NACS and SIGMA also support the comments filed by VNG.co LLC.[2]

I. Overview of the Associations

NACS and SIGMA represent approximately 80 percent of retail motor fuel sales in the United States.[3] The Associations' members are the consumer-facing entities in the fuel space,[4] and are constantly adapting to changing consumer demands. Offering a product for sale does not guarantee that consumers will purchase it. Motorists do not purchase products because members of the Associations sell them; the Associations' members sell products because their customers purchase them. Thus, the Associations' members will continue to invest in equipment to support renewable and alternative fuels if their customers demand it. Likewise, automakers sell vehicles that consumers want to purchase—and the low demand for small, more fuel-efficient vehicles, has made it difficult to achieve the Agencies' GHG goals as outlined in their Final Determination.[5]

---

[2] VNG.co LLC, Comments by VNG.co LLC on Reconsideration of the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emissions Standards For Model Year 2022–2025 Light-Duty Vehicles (EPA–HQ–OAR–2015–0827) (October 6, 2017), Comment ID Number: EPA-HQ-OAR-2015-0827-8077, *available at* https://www.regulations.gov/document?D=EPA-HQ-OAR-2015-0827-8077.

[3] NACS is an international trade association representing the convenience store industry with more than 2,200 retail and 1,600 supplier companies as members, the majority of whom are based in the United States. SIGMA represents a diverse membership of approximately 260 independent chain retailers and marketers of motor fuel.

[4] In 2016, the fuel wholesaling and convenience industry employed more than 2.3 million workers and generated $549.9 billion in total sales, representing approximately 3 percent of U.S. Gross Domestic Product. Because of the number of fuel and other transactions in which the industry engages, fuel retailers and marketers handle approximately one of every 30 dollars spent in the United States. Fuel retailers serve about 160 million people per day—around half of the U.S. population—and the industry processes over 73 billion payment transactions per year.

[5] Environmental Protection Agency, *Final Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation*, EPA-420-R-17-001 (January 2017), *available at* : https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100QQ91.pdf [*hereinafter* "Final Determination"].

II. Comments on Reconsideration of Final Determination

In 1975, Congress established the Corporate Average Fuel Economy ("CAFE") program to reduce energy consumption by improving fuel efficiency in vehicles. As part of the program, EPA and NHTSA collaborated to establish fuel economy standards for cars and trucks sold in the United States that would also reduce GHG emissions. The goal of the CAFE program is clear: to reduce the usage of petroleum fuels. Despite the varied technological fuel options that could support this goal, regulatory incentives and requirements built into current GHG emissions standards disproportionately favor EV technology over other technology, including NGVs, notwithstanding the beneficial emissions characteristics of certain renewable fuels, such as CNG.

A. Natural Gas Vehicles could increase estimates of achievable emissions.

Per recent marketplace trends, consumers prefer larger, less fuel-efficient vehicles. Problematically, many of those larger vehicles, including light-duty trucks, have performance requirements for which electric batteries are not a suitable alternative to reduce emissions as the batteries are too costly and too heavy. Because of this, the auto industry insists it cannot reach the GHG emissions goals in the Final Determination. Fortunately, there are alternative non-EV fueling options that could meet GHG emissions goals. CNG, for example, is a low-emission, non-petroleum fuel for light trucks that has already been introduced into the automotive industry. Moreover, as a fuel source, CNG does not present the same structural hurdles for light-duty vehicles that EV technology does. Nevertheless, NGVs were not considered in the Agencies' Final Determination. As the Agencies reconsider GHG standards, CNG should be factored into emissions targets for light trucks and pickups. Reforming the light-duty emission regulations to include NGVs will create an achievable pathway for automakers to comply with the GHG goals while also allowing the Agencies to maintain existing emissions targets.

B. The Agencies should not favor one technology over another; the Agencies should provide regulatory incentives for all technologies that present positive emissions characteristics.

As long as automakers are meeting the goals of the CAFE program, the Agencies should not favor one technology over another. Not only is this a more equitable approach to policy, it also limits the damage when the government backs the wrong technology horse or when policy incentives change.[6] In 1988, Congress passed the Alternative Motor Fuels Act[7], which calculates the fuel economy of NGVs and EVs by the Petroleum Equivalency Factor. Therefore, every gallon-equivalent of compressed natural gas or equivalent electrical energy should be calculated as 0.15 gallons of gasoline, known as the "0.15 divisor." As mentioned previously, the Agencies

[6] For example, the tax code is frequently utilized to achieve tax policy results. In the latest iterations of the House tax reform bill, however, the electric vehicle credit was removed.

[7] Alternative Motor Fuels Act of 1988, Public Law 100-494, 102 Stat. 2441.

have maintained incentives for EVs in their regulations, but failed to calculate NGV emissions by the 0.15 divisor. The Agencies should eliminate the divisor for both technologies or impose it on both, to reflect emissions benefits of 85 percent over a gasoline vehicle.

Likewise, the Agencies should eliminate regulations that require dual-fueled, or bi-fueled, gasoline-natural gas vehicles to satisfy burdensome eligibility requirements to receive emissions reduction credits. Because of their built-in backup fuel option, dual-fueled vehicles serve as a necessary transition product to penetrate the market because they relieve consumer anxiety about running out of "juice". These vehicles maintain emissions credits based on their "utility factor," a relative alternative fuel consumption calculation. In order to qualify for emissions benefits, however, the NGV must have a CNG range that is *double* the range of traditional gasoline. Dual-fueled EVs, on the other hand, are not required to have an electric range that is double the range of traditional gasoline.

In order to further the goals of the CAFE program, the Agencies should remove unbalanced regulatory incentives that skew the market towards a particular technology. As such, the Agencies should incorporate a natural gas-fueled full-size light pickup CO_2 credit that is equivalent in value to credits for strong hybrid electric vehicles. However, there should not be a minimum deployment requirement since the market challenges faced by NGVs are greater than hybrid-electrics.

C. Favoring EVs has led to other problematic market externalities.

Because of the Agencies' regulatory incentives, EV technology has been disproportionately favored over other technology despite (1) the similar positive emissions characteristics of non-EV alternatives and (2) the small market share that EV's occupy. Consequently, this has led to other negative marketplace externalities about which the Agencies may be unaware. Specifically, utility companies are attempting to enter the vehicle recharging business for EVs on the back of the ratepayer, to the detriment of consumers.

Utility companies are allowed a monopoly over the provision of electricity in a particular marketplace because it is inefficient for multiple companies to build overlapping infrastructure in order to service the same building or home. In exchange for this loss of market freedom, utility companies are guaranteed a rate of return from ratepayers.

A benefit that utility companies enjoy is their ability to recover their investment costs if those costs are included in the rate base. So it is not surprising that utility companies have endeavored to treat their capital investments in the vehicle recharging business as part of the utility rate base. Subsequently, the utilities' market entry costs are essentially zero. The private sector, including many members of the Associations, cannot compete with zero market entry costs. Thus, the current regulatory system essentially provides utilities a monopoly on the service of EV refueling, which undercuts the competitive nature of the refueling marketplace, ultimately

harming consumers by increasing the cost to refuel. On the other hand, robust competition drives greater efficiency, diversified options, and lower costs for consumers.

III. Conclusion

Thank you for the opportunity to provide these comments. NACS and SIGMA stand ready to be of assistance to the Agencies in their consideration of this matter.

Respectfully,

R. Timothy Columbus
Eva V. Rigamonti
Counsel to NACS and SIGMA

Message

From: Dan Byers [globalenergy@uschamber.com]
Sent: 4/3/2018 5:18:12 PM
To: Bolen, Brittany [bolen.brittany@epa.gov]
Subject: The latest on fuel efficiency standards, energy litigation, and more.....

April Energy Tracker Updates

Dear Brittany:

Below are the latest updates to the Global Energy Institute – Beveridge & Diamond Energy Tracker. Headlining the updates over the last month is today's announcement by EPA Administrator Scott Pruitt that his agency will revise light-duty vehicle fuel efficiency standards.

As a one-stop shop for monitoring key energy policy and litigation activities, the Tracker can also bring you up to speed on less noticed developments as well. Other notable updates last month include:

- *3/12/18:* EPA finalizes proposal to stay deadlines pertaining to stay certain requirements associated with 2016 methane NSPS rule.
- *3/12/18:* Court issues opinion upholding FERC waiver overruling New York's permit denial for Millennium's Valley Lateral pipeline.
- *3/13/18:* EPA issues guidance memo clarifying application of "project netting" determinations associated with New Source Review (NSR) permitting requirements. For a detailed summary of this and related actions, please see this Beveridge and Diamond News Alert.
- *3/16/18:* D.C. Circuit holds oral arguments in challenge to EPA delay of Risk Management Plan regulation (*Air Alliance Houston v. EPA, No. 17-1155*).
- *3/23/18:* U.S. District Court of North Dakota issues order granting states' request to resume litigation on WOTUS rule.
- *3/26/18:* Environmental petitioners file for review of EPA's final action reversing "once-in, always-in" policy under section 112 of the Clean Air Act.
- *3/27/18:* National Highway Traffic Safety Administration proposes to retain civil penalties for auto manufacturer CAFE violations, rejecting Obama Administration proposal to increase fines.
- *4/3/18:* EPA announces completion of the Midterm Evaluation (MTE) process for light duty vehicle GHG standards for model years 2022-2025, determining that current standards are not appropriate and should be revised.

Please share the Tracker updates with co-workers and colleagues interested in following the latest in energy policy!

SHARE

Sincerely,

Dan Byers
Vice President Policy
Global Energy Institute
U.S Chamber of Commerce

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Message

From: Jackson, Ryan [jackson.ryan@epa.gov]
Sent: 4/3/2018 1:35:48 PM
To: David Schwietert [DSchwietert@autoalliance.org]
CC: Letendre, Daisy [letendre.daisy@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Bolen, Brittany [bolen.brittany@epa.gov]; Harlow, David [harlow.david@epa.gov]
Subject: Re: RealClearPolitics commentary by Bainwol

Thanks.

Ryan Jackson
Chief of Staff
U.S. EPA
202-564-6999

On Apr 3, 2018, at 9:07 AM, David Schwietert <DSchwietert@autoalliance.org> wrote:

FYI

From: Gloria Bergquist
Sent: Tuesday, April 03, 2018 9:05 AM
To: bowman.liz@epa.gov
Cc: Amy Dewey <dewey.amy@epa.gov>; David Schwietert <DSchwietert@autoalliance.org>
Subject: RealClearPolitics commentary by Bainwol

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Mitch Bainwol is president and CEO of the Auto Alliance, the leading automotive advocacy group composed of 12 automakers.

GLORIA BERGQUIST
Vice President, Communications and Public Affairs

Alliance of Automobile Manufacturers <!--[if !vml]--><image003.jpg><!--[endif]-->
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Message

From: David Schwietert [DSchwietert@autoalliance.org]
Sent: 4/3/2018 1:07:52 PM
To: Letendre, Daisy [letendre.daisy@epa.gov]; Jackson, Ryan [jackson.ryan@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Bolen, Brittany [bolen.brittany@epa.gov]; Harlow, David [harlow.david@epa.gov]
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Contrary to the breathless coverage of the Trump administration's action to revisit fuel economy and greenhouse gas emission standards, this decision actually fulfills key promises made by the prior administration. Early in Barack Obama's first term in office, automakers agreed with the president to establish long-term fuel economy targets stretching out to 2025. This bold plan, requiring massive investment by automakers to achieve a social goal we embraced -- addressing climate change -- came with two prudent obligations by policymakers.

First, President Obama and his team committed to undertake a midterm review halfway through the timeframe (2018) to check government predictions against reality and use that information to set standards for 2022-2025. The midterm look-back recognized the challenge of forecasting market and technology factors long into the future, as well as the importance of using evidence-based analysis because the economic stakes were so significant.

Second, policymakers made a commitment to harmonize three regulatory programs that effectively serve the same purpose – managing fuel efficiency/carbon. National Highway Traffic Safety Administration, EPA and California's Air Resources Board all regulate emissions, but in different ways and with different timelines. Redundant government programs drive compliance costs up and that ultimately comes out of the wallets of our customers. The Obama administration stated in writing: "Continuing the National Program ensures that auto manufacturers can build a single fleet of U.S. vehicles that satisfy requirements of both federal programs as well as California's program."

Both of these commitments made sense. The agreement was sound. The goals were shared. And the plan was launched. But something funny happened on the way to the forum.

After the 2016 election, EPA chose to short-circuit the midterm analysis and advance a finding nearly 18 months before it was due. Politics took hold; marketplace realities were ignored. The federal program itself was split, with EPA jumping ahead of NHTSA. The original estimated targets were then justified and rushed through, irrespective of contradictory but salient market developments and irrespective of NHTSA's role in the process. Both commitments – the midterm and One National Program – were abrogated.

The market reality is clear. No factor is more relevant than gas prices, which remain significantly lower than projected. In reaction, consumers are buying more SUVs and trucks, bigger engines and fewer alternative powertrains than regulators expected. When the EPA issued the premature determination early last year, it trumpeted the statistic that automakers were over-complying. Weeks later, government reports indicated that statistic was no longer operative, and, for the first time, automakers missed the emissions targets despite achieving record fuel economy. Since then, compliance has slipped even further.

Remember, the government evaluates automakers on fuel economy standards by what consumers buy – not what automakers put in dealer showrooms. In short, the buying pattern of the American public has demonstrated that a rigid adherence to the standards -- as originally contemplated nearly a decade ago -- is inconsistent with market realities.

Moreover, two or three different regulatory rule sets make no sense. As such, we enthusiastically embrace the idea of One National Program. We did so when we signed up in 2011. We did so in the days immediately after the 2016 election and we do so now. Nothing has changed. Writing to the Trump transition team in November of 2016, we asked that "the White House lead efforts with EPA, NHTSA, CARB and the automakers on finding a pathway forward regarding the standards for 2022 MY and beyond."

Here we are, in April of 2018, the precise point at which the previous administration suggested a judgment be reached about whether to adjust the standards. The new administration has spent a year conducting research, looking at the unfolding data – and has reached the determination that adjustments are warranted.

"Adjustments" are not rollbacks. We favor standards that increase year over year. The industry is committed to ongoing progress in a journey that has no end date. After all, we have invested substantially in energy-efficient technologies that we would like to see consumers embrace. We expect that fuel economy will keep rising. The only issue is at what speed. We do not buy the view that the 2012 projections were perfect and that conditions are unchanged. On the contrary, the projections were materially imperfect and conditions have fundamentally changed.

Even so, no matter how these standards ultimately adjust, the fuel savings through 2025 will likely achieve at least 97 percent of the original estimates. That's because there is profoundly more savings realized on the front end of the curve than on the back end – as moving from 10 to 20 miles per gallon produces 10 times more savings than moving from 40 to 50 miles per gallon.

We asked administration officials to look at the data and base their decision on marketplace realities. They have. We asked them to work with California to try to find a policy outcome that works for both. They are embarked on that mission. Let's give that a try. Too much is at stake to let politics and overheated rhetoric get in the way.

Mitch Bainwol is president and CEO of the Auto Alliance, the leading automotive advocacy group composed of 12 automakers.

GLORIA BERGQUIST
Vice President, Communications and Public Affairs

AUTO ALLIANCE
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Alliance of Automobile Manufacturers
202-326-5596 Desk
202-329-1398 Mobile
www.autoalliance.org

Message

From: David Schwietert [DSchwietert@autoalliance.org]
Sent: 6/16/2017 6:03:53 PM
To: Owens, James (OST) [j.owens@dot.gov]; McInerney, Marianne (OST) [marianne.mcinerney@dot.gov]; Loren Smith (loren.smith@dot.gov) [loren.smith@dot.gov]; Dravis, Samantha [dravis.samantha@epa.gov]; Bolen, Brittany [bolen.brittany@epa.gov]; Catanzaro, Michael J. EOP/WHO [Ex. 6 - Personal Privacy
Subject: EPA meeting with Auto Representatives next Thursday (6/22) - details below

All,

As I passed along earlier to a few of you, next Thursday (6/22) the EPA Ann Arbor office will be hosting a meeting with the Alliance and Global Automakers, as well as OEM representatives to go over questions regarding the proposed/final determination and the Draft TAR from last Summer.

This meeting is an outgrowth of the recent NHTSA/VOLPE meetings in Massachusetts which EPA wasn't involved with.

Wanted you to be aware and the call in number/passcode appears below.

We were informed this was just a meeting with career EPA staff members and that NHTSA and CARB were invited to call in.

I have also recently learned that EPA career staff have been holding meetings with individual OEM's to go over manufacturer comments to the proposed determination – including confidential information that would include product plans for future Model Years.

Dave

Subject: HOLD: Alliance/Global Meeting on MTE issues

Location: AA-Room-Office-C35-ConfRoom/AA-OTAQ-OFFICE <AA-Room-Office-C35-ConfRoom@epa.gov> Ex. 6 - Personal Privacy

Start: Thu 6/22/2017 1:00 PM

End: Thu 6/22/2017 3:00 PM

Recurrence: (none)

Meeting Status: Meeting organizer

Organizer: Moran, Robin

Required Attendees: Olechiw, Michael; Bolon, Kevin; Yanca, Catherine; Moskalik, Andrew; Barba, Daniel; Kargul, John; Newman, Kevin; Cherry, Jeff; Sherwood, Todd; Mikkelsen, Brandon; McCarthy, Mike@ARB; james tamm; Kevin Green; Mader, Pippin@ARB; Charmley, William; Julia Rege; Chris Nevers; MHartrick@autoalliance.org; McDonald, Joseph; Alson, Jeff; Caffrey, Cheryl

Resources: AA-Room-Office-C35-ConfRoom/AA-OTAQ-OFFICE

Categories: Stakeholder meeting

The Alliance and Global, along with member OEMs, would like to meet to discuss open issues from their past comments on the TAR/Proposed Determination. The associations will send a list of topics and specific questions about a week prior to the meeting.

NHTSA and CARB are invited to participate. Please let me know if there are other staff you'd like added to this invite.

Ex. 6 Personal Privacy (PP)

We also plan to do a WebEx connection (details to follow)

David Schwietert
Executive Vice President, Federal Government Relations & Public Policy
P: 202-326-5521 | dschwietert@autoalliance.org

AUTO ALLIANCE
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ALLIANCE OF AUTOMOBILE MANUFACTURERS
803 7th Street, NW
Suite 300
Washington, DC 20001
Main Phone: 202-326-5500
Main Fax: 202-326-5567

https://autoalliance.org/

Curious to know how the Auto sector impacts your state or district -- Click here. To get a better understanding of how America's automobile industry is one of the most powerful engines driving the U.S. economy, click here.

Appointment

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 2/28/2018 3:17:59 PM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Cook, Leila [cook.leila@epa.gov]; Charmley, William [charmley.william@epa.gov]
CC: Moran, Robin [moran.robin@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Caffrey, Cheryl [caffrey.cheryl@epa.gov]

Subject: Meet with Aluminum Association - Aluminum Transport Group Members (Confirmed)
Attachments: Aluminum Association Meeting Request; Confirmed 3/2 at 3pm: Aluminum Association Meeting Request; Confirmed 3/1 at 4pm: Aluminum Association Meeting Request; RE: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request
Location: WJC-N 5400 + Video with AA

Start: 3/1/2018 9:00:00 PM
End: 3/1/2018 9:45:00 PM
Show Time As: Busy

Re: automotive GHG emissions and fuel economy regulations
To: Bill Wehrum, Mandy Gunasekara, Chris Grundler, Ben Hengst, Lee Cook, Bill Charmley
Outside Attendees (in person):

- Henry Gordinier, Tri-Arrows
- Ganesh Panneer, Novelis
- Delphine Dahan-Kocher, Constellium
- Dan Minwell, Constellium
- Mario Greco, Arconic
- Mike Belwood, Arconic
- Joe Quinn, Aluminum Association
- Matt Meenan, Aluminum Association
- John Fitzpatrick, Stratacomm

Aluminum Association Meet... | Confirmed 3/2 at 3pm: Aluminum ... | Confirmed 3/1 at 4pm: Aluminum ... | RE: Confirmed 3/1 at 4pm: Aluminu...

Message

From: Lauren Wilk [lwilk@aluminum.org]
Sent: 2/1/2018 5:05:48 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]
Subject: Aluminum Association Meeting Request

Emily and Josh --

Will Lovett suggested I connect with you on scheduling a meeting with Assistant Administrator Wehrum for a few representatives of the aluminum industry. We have availability on the following dates: February 16, 20, 21, 23, 26, 27, 28 or March 1 (but we can certainly be flexible if an alternative date is necessary).

The Aluminum Association is active with EPA on a number of issues -- and specifically, the members of our Aluminum Transportation Group (ATG) would very much like to hear directly from Mr. Wehrum about the Administration's priorities related to automotive GHG emissions and fuel economy regulations. The ATG represents the Association's member companies that produce aluminum for use in cars and trucks, including Alcoa, Arconic, Novelis, Rio Tinto and others.

The aluminum industry plays a significant role in the automotive supply chain, and the pounds of aluminum content per vehicle has grown by more than 30 percent over the past decade. Driven by that auto sector growth, the aluminum industry has announced or completed U.S. plant expansions and investments of more than $2.6 billion since 2013. Already this year, Novelis announced that it was investing $300 million in a new greenfield automotive finishing facility in Guthrie, Kentucky. The industry is acutely interested in the outcome of the midterm review on vehicle fuel economy, and we have met previously with the White House, OMB, NHTSA, CARB and others on this topic.

I'd be happy to answer any questions or provide additional background, if that's helpful.

Thanks so much,

Lauren

The Aluminum Association

Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | **C** 913.244.2796 | **F** 703.358.2961
JOIN THE CONVERSATION:

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/7/2018 8:01:58 PM
To: Lauren Wilk [lwilk@aluminum.org]
Subject: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request

Hi Lauren,
You are confirmed for 45 minute meeting on Thursday, March 1, 2018 at 4:00pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Wednesday, February 07, 2018 2:59 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Thanks so much, Emily. That's perfect.

I'll circle back, closer to the meeting, with a list of attendees. Let me know if you need anything else in the meantime.

Lauren

Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | C 913.244.2796| F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, February 07, 2018 12:33 PM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi Lauren,

It looks like we could fit this in on Thursday, March 1 at 4:00pm. Let me know if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Wednesday, February 07, 2018 11:01 AM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi, Emily. One of the technical experts I was hoping to bring in for our meeting with Mr. Wehrum will unfortunately be out of the country on Friday 3/2. Is there any chance that Mr. Wehrum would be available to meet on Thursday 3/1, or sometime March 12-16? If not, we'll keep our March 2 meeting and I'll have my colleague prepare his technical materials in advance.

Thanks so much,

Lauren

Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202

T 703.358.2981 | C 913.244.2796 | F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Tuesday, February 06, 2018 9:25 AM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi Lauren,

Yes, we could accommodate a group of 8 attending this meeting.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Monday, February 05, 2018 2:52 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Re: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Thanks, Emily. I appreciate your help in getting this nailed down.

I would like to invite a few member company representatives to join, so I'm curious if there's a hard limit on number of attendees — would 6-8 (as a total group size) be workable?

Best,

Lauren

Lauren Wilk
The Aluminum Association
Office: (703) 358-2981

On Mon, Feb 5, 2018 at 2:38 PM -0500, "Atkinson, Emily" <Atkinson.Emily@epa.gov> wrote:

> Hi Lauren,
> You are confirmed for 45 minute meeting on Friday, March 2, 2018 at 3:00pm with Bill Wehrum.
> Directions and procedures to 1200 Pennsylvania Avenue NW:
>
> > Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

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Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Monday, February 05, 2018 12:56 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Aluminum Association Meeting Request

Thanks, Emily. We'll take the meeting on March 2 at 3pm, and I'll firm up attendees on our end.

Let me know what details you need in advance of the meeting.

Much appreciated!

Lauren

The Aluminum Association
Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | C 913.244.2796 | F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Monday, February 05, 2018 12:48 PM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Aluminum Association Meeting Request

Hi Lauren,

It looks like Bill Wehrum could be available for a 45 minute meeting on Friday, March 2, 2018 at 3:00pm.

Please advise if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Thursday, February 01, 2018 12:06 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Aluminum Association Meeting Request

Emily and Josh –

Will Lovett suggested I connect with you on scheduling a meeting with Assistant Administrator Wehrum for a few representatives of the aluminum industry. We have availability on the following dates: February 16, 20, 21, 23, 26, 27, 28 or March 1 (but we can certainly be flexible if an alternative date is necessary).

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JOIN THE CONVERSATION:

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/5/2018 7:38:19 PM
To: Lauren Wilk [lwilk@aluminum.org]
Subject: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

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Management Analyst/Office Manager
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Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Thursday, February 01, 2018 12:06 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Aluminum Association Meeting Request

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The Aluminum Association

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Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | C 913.244.2796| F 703.358.2961
JOIN THE CONVERSATION:

Message

From: Lauren Wilk [lwilk@aluminum.org]
Sent: 2/28/2018 3:13:28 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]
CC: Matt Meenan [mmeenan@aluminum.org]
Subject: RE: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request

Hi, Emily. I wanted to send you a list of attendees for tomorrow's meeting at EPA. My colleague Matt Meenan (copied here) will be with the group, if you need to reach him for any reason. Please let me know if you need any additional information from me in advance of the meeting.

- Henry Gordinier, Tri-Arrows
- Ganesh Panneer, Novelis
- Delphine Dahan-Kocher, Constellium
- Dan Minwell, Constellium
- Mario Greco, Arconic
- Mike Belwood, Arconic
- Joe Quinn, Aluminum Association
- Matt Meenan, Aluminum Association
- John Fitzpatrick, Stratacomm

Much appreciated!

Lauren

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The Aluminum Association
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Arlington, VA 22202
T 703.358.2981 | C 913.244.2796| F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, February 07, 2018 3:02 PM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request

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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Wednesday, February 07, 2018 2:59 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Thanks so much, Emily. That's perfect.

I'll circle back, closer to the meeting, with a list of attendees. Let me know if you need anything else in the meantime.

Lauren

The Aluminum Association
Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | C 913.244.2796 | F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, February 07, 2018 12:33 PM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi Lauren,

It looks like we could fit this in on Thursday, March 1 at 4:00pm. Let me know if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Wednesday, February 07, 2018 11:01 AM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi, Emily. One of the technical experts I was hoping to bring in for our meeting with Mr. Wehrum will unfortunately be out of the country on Friday 3/2. Is there any chance that Mr. Wehrum would be available to meet on Thursday 3/1, or sometime March 12-16? If not, we'll keep our March 2 meeting and I'll have my colleague prepare his technical materials in advance.

Thanks so much,

Lauren

The Aluminum Association
Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | C 913.244.2796 | F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Tuesday, February 06, 2018 9:25 AM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi Lauren,

Yes, we could accommodate a group of 8 attending this meeting.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA

Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Monday, February 05, 2018 2:52 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Re: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Thanks, Emily. I appreciate your help in getting this nailed down.

I would like to invite a few member company representatives to join, so I'm curious if there's a hard limit on number of attendees — would 6-8 (as a total group size) be workable?

Best,

Lauren

Lauren Wilk
The Aluminum Association
Office: (703) 358-2981

On Mon, Feb 5, 2018 at 2:38 PM -0500, "Atkinson, Emily" <Atkinson.Emily@epa.gov> wrote:

Hi Lauren,
You are confirmed for 45 minute meeting on Friday, March 2, 2018 at 3:00pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.

Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager

Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Monday, February 05, 2018 12:56 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Aluminum Association Meeting Request

Thanks, Emily. We'll take the meeting on March 2 at 3pm, and I'll firm up attendees on our end.

Let me know what details you need in advance of the meeting.

Much appreciated!

Lauren

The Aluminum Association

Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | C 913.244.2796| F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Monday, February 05, 2018 12:48 PM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Aluminum Association Meeting Request

Hi Lauren,

It looks like Bill Wehrum could be available for a 45 minute meeting on Friday, March 2, 2018 at 3:00pm.

Please advise if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Thursday, February 01, 2018 12:06 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Aluminum Association Meeting Request

Emily and Josh –

Will Lovett suggested I connect with you on scheduling a meeting with Assistant Administrator Wehrum for a few representatives of the aluminum industry. We have availability on the following dates: February 16, 20, 21, 23, 26, 27, 28 or March 1 (but we can certainly be flexible if an alternative date is necessary).

The Aluminum Association is active with EPA on a number of issues – and specifically, the members of our Aluminum Transportation Group (ATG) would very much like to hear directly from Mr. Wehrum about the Administration's priorities related to automotive GHG emissions and fuel economy regulations. The ATG represents the Association's member companies that produce aluminum for use in cars and trucks, including Alcoa, Arconic, Novelis, Rio Tinto and others.

The aluminum industry plays a significant role in the automotive supply chain, and the pounds of aluminum content per vehicle has grown by more than 30 percent over the past decade. Driven by that auto sector growth, the aluminum industry has announced or completed U.S. plant expansions and investments of more than $2.6 billion since 2013. Already this year, Novelis announced that it was investing $300 million in a new greenfield automotive finishing facility in Guthrie, Kentucky. The industry is acutely interested in the outcome of the midterm review on vehicle fuel economy, and we have met previously with the White House, OMB, NHTSA, CARB and others on this topic.

I'd be happy to answer any questions or provide additional background, if that's helpful.

Thanks so much,

Lauren

The Aluminum Association
Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 | C 913.244.2796| F 703.358.2961
JOIN THE CONVERSATION:

Appointment

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 12/13/2017 2:05:22 PM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Harlow, David [harlow.david@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Sutton, Tia [sutton.tia@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Charmley, William [charmley.william@epa.gov]; Moran, Robin [moran.robin@epa.gov]; Woods, Clinton [woods.clinton@epa.gov]

Subject: Meet with National Coalition for Advanced Transportation (NCAT) (Confirmed)
Attachments: RE: Request for Meeting; Confirmed 12/13 at 4pm: Request for Meeting
Location: WJC-N 5415 + Video with AA + Ex. 6 Personal Privacy (PP)

Start: 12/13/2017 2:30:00 PM
End: 12/13/2017 3:15:00 PM
Show Time As: Busy

To: Bill Wehrum, Mandy Gunasekara, David Harlow, Alex Dominguez, Ben Hengst, Tia Sutton, Chris Grundler, Bill Charmley, Robin Moran, and Mike Olechiw, Clint Woods
Outside Attendees (in person): TBD

Confirmed 12/13 at 4pm: Request for...

RE: Request for Meeting

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 11/22/2017 1:49:21 PM
To: Robert.Wyman@LW.com
CC: Loving, Shanita [Loving.Shanita@epa.gov]
Subject: Confirmed 12/13 at 4pm: Request for Meeting

Hi Bob,

You are confirmed for a 45 minute in person meeting on Wednesday, December 13, 2017 at 4:00pm with Bill Wehrum.

Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.

Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Acting Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

-----Original Message-----
From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Tuesday, November 21, 2017 4:57 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Request for Meeting

Yes, definitely. Thank you.

From: Atkinson, Emily <Atkinson.Emily@epa.gov>
Sent: Tuesday, November 21, 2017 1:48:14 PM
To: Wyman, Robert (LA)
Cc: Loving, Shanita
Subject: RE: Request for Meeting

Hi Bob,

It looks like Bill Wehrum could be available for a 45 minute in person meeting on Wednesday, December 13, 2017 at 4:00pm.

Please advise if this could work on your end.

Thank you.
Emily

Emily Atkinson
Management Analyst/Office Manager

Immediate Office of the Acting Assistant Administrator Office of Air and Radiation, USEPA Room 5412B, 1200 Pennsylvania Avenue NW Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Friday, November 17, 2017 6:03 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Request for Meeting

Emily - thank you for speaking with me by telephone earlier today. I am writing to request a meeting with Bill Wehrum on the subject of the midterm evaluation and the national greenhouse gas emissions standards for motor vehicles. I make this request on behalf of the National Coalition for Advanced Transportation (NCAT).

NCAT is a coalition of leading companies that support electric vehicle and other advanced transportation technologies and related infrastructure, including through: energy supply, transmission and distribution; vehicle and component design and manufacturing; charging infrastructure, battery and other energy-storage technology design, production and implementation; infrastructure engineering and construction; and the movement of passengers, goods and services; among other activities. Prior to our meeting, I will provide a list of NCAT attendees.

If possible, we would like to meet with Mr. Wehrum and appropriate staff, as he determines, on Wednesday, December 13, at any time. Of course, we recognize that his schedule may not permit meeting on this date, in which case we will do our best to accommodate whatever date he selects.

Sincere thanks.

Bob

Robert A. Wyman, Jr.
LATHAM & WATKINS LLP
Email: robert.wyman@lw.com<mailto:robert.wyman@lw.com>

355 South Grand Avenue
Los Angeles, CA 90071-1560
Direct: +1.213.891.8346

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Latham & Watkins LLP or any of its affiliates may monitor electronic communications sent or received by our networks in order to protect our business and verify compliance with our policies and relevant legal requirements.

Latham & Watkins LLP

Appointment

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 1/22/2018 9:27:06 PM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Burch, Julia [Burch.Julia@epa.gov]; Charmley, William [charmley.william@epa.gov]; Moran, Robin [moran.robin@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Simon, Karl [Simon.Karl@epa.gov]
CC: Alson, Jeff [alson.jeff@epa.gov]

Subject: Meet with Toyota re: MidTerm Review (MTR) for autos/light duty trucks (Confirmed)
Attachments: RE: Meeting Requests for Toyota ; FW: Meeting Requests for Toyota from S. Fotis; Confirmed 12/15 at 3pm: Meeting Requests for Toyota from S. Fotis; Confirmed 1/23/18 at 10am: Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis; RE: Rescheduling Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis
Location: WJC-N 5400 + Video with AA + Dial: Ex. 6 Personal Privacy (PP)

Start: 1/23/2018 4:00:00 PM
End: 1/23/2018 4:45:00 PM
Show Time As: Busy

To: Bill Wehrum, Chris Grundler, Ben Hengst, Julia Burch, Bill Charmley, Robin Moran, Mike Olechiw and Karl Simon
Outside Attendees (in person):

- Tom Stricker, Vice President, Technical and Regulatory Affairs, Toyota
- Fred Turatti, General Manager, Toyota Motor North America
- Rick Gezelle, Manager, Technical and Regulatory Affairs
- Andrea Campbell, Van Ness Feldman, legal counsel for Toyota

RE: Meeting Requests for Toy... | FW: Meeting Requests for Toy... | Confirmed 12/15 at 3pm: Meeting Re... | Confirmed 1/23/18 at 10am: Meetin... | RE: Rescheduling Meeting with US...

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 12/11/2017 8:26:45 PM
To: Stephen Fotis [scf@vnf.com]
CC: Loving, Shanita [Loving.Shanita@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]
Subject: Confirmed 1/23/18 at 10am: Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis

Hi Stephen,

You are confirmed for a 45 minute in person meeting on Tuesday, January 23, 2018 at 10:00am EDT with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.
Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Monday, December 11, 2017 3:22 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: RE: Rescheduling Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis

Emily – I would like to confirm January 23, 2018 at 10:00am EDT for the Toyota meeting with Bill. I will shortly provide you with the names of individuals who will be participating in the meeting on behalf of Toyota.
Many thanks for your assistance!

Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Monday, December 11, 2017 3:00 PM
To: Stephen Fotis
Cc: Loving, Shanita; Lewis, Josh
Subject: RE: Rescheduling Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis

Hi Stephen,

Yes, Josh Lewis and I have coordinated on this to review scheduling options and January 23, 2018 at 10:00am EDT is the first available time to slot this meeting in for Bill Wehrum.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Monday, December 11, 2017 2:48 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: RE: Rescheduling Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis

Thanks Emily. In my conversations with Josh earlier today, we were talking about trying to schedule a Toyota meeting with Bill in early January, either at the end of the first week of January (January 4 or 5) or the following week (January 8-12). Before we schedule a meeting for the January 23, I want to confirm that there is no chance of scheduling a meeting during either of these two weeks.
Best,
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Monday, December 11, 2017 2:39 PM
To: Stephen Fotis
Cc: Loving, Shanita; Lewis, Josh
Subject: Rescheduling Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis

Hi Stephen,

It looks like the earliest date we could fit this in is for 45 minutes on Tuesday, January 23, 2018 at 10:00am EDT.

Please advise if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Friday, December 08, 2017 5:22 PM
To: Lewis, Josh <Lewis.Josh@epa.gov>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>; Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Confirmed 12/15 at 3pm: Meeting Requests for Toyota from S. Fotis

Thanks Josh for your email. I totally understand and very much appreciate your efforts to meet with Toyota. Please let me check with the client and will get back to you on Monday. Have a great weekend.
Best,
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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From: Lewis, Josh [mailto:Lewis.Josh@epa.gov]
Sent: Friday, December 08, 2017 2:14 PM
To: Stephen Fotis
Cc: Atkinson, Emily; Loving, Shanita
Subject: FW: Confirmed 12/15 at 3pm: Meeting Requests for Toyota from S. Fotis

Hi Stephen,

Bill now will be out of the office next Friday for work travel. We could keep the meeting for Friday (EPA participants would include a combination of the political team – Mandy Gunasekara/David Harlow/maybe others – along with career folks from OTAQ); or, if you want to reschedule with Bill, we'd be looking to early January to schedule. What is your preference?

Josh Lewis
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 564 2095
Cell: 202 329 2291

From: Atkinson, Emily
Sent: Thursday, November 30, 2017 4:36 PM
To: Stephen Fotis <scf@vnf.com>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: Confirmed 12/15 at 3pm: Meeting Requests for Toyota from S. Fotis

Hi Stephen,

You are confirmed for a 45 minute in person meeting on Friday, December 15, 2017 at 3:00pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.

Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager

Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Thursday, November 30, 2017 4:27 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Meeting Requests for Toyota from S. Fotis

Emily - Friday, December 15, 2017 at 3:00 PM works for Toyota. I will get back to you shortly with the names and titles of those individuals who will be attending the meeting with Bill on behalf of Toyota.
Again, many thanks for all of your assistance here.
Have a great rest of the day.
Best,
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Thursday, November 30, 2017 3:43 PM
To: Stephen Fotis
Cc: Loving, Shanita
Subject: FW: Meeting Requests for Toyota from S. Fotis

Hi Stephen,

It looks like Bill Wehrum could be available for a 45 minute in person meeting on Friday, December 15, 2017 at 3:00pm with Toyota.

Please advise if this could work on your end.

Thank you.
Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW

Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Wednesday, November 29, 2017 12:37 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

Thank you Emily for your assistance.
Best,
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, November 29, 2017 11:51 AM
To: Stephen Fotis
Subject: RE: Meeting Requests for Toyota and Shell

Hi Stephen,

We are reviewing scheduling options now and will get back to you shortly.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Tuesday, November 28, 2017 5:32 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

Hi Emily – As suggested by Bill in his email below, I am following up with you regarding the scheduling of two separate meetings with Bill – one with Toyota on the Mid Term Review (MTR) for autos/light duty trucks, and the other with Shell on the OOOOa NSPS reconsideration rulemaking. Could you please advise me as to possible times that we might schedule these meetings? If possible, I'd like to try to schedule meetings for later this December before the holidays. Many thanks for your assistance.

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From: Wehrum, Bill [mailto:Wehrum.Bill@epa.gov]
Sent: Monday, November 27, 2017 12:29 PM
To: Stephen Fotis
Cc: Atkinson, Emily
Subject: RE: Meeting Requests for Toyota and Shell

Thanks Stephen. I'm copying Emily Atkinson. She can work with you to find times.

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Monday, November 27, 2017 11:29 AM
To: Wehrum, Bill <Wehrum.Bill@epa.gov>; Wehrum, Bill <Wehrum.Bill@epa.gov>
Subject: Meeting Requests for Toyota and Shell

Bill – I hope that you had a good Thanksgiving and had some time to relax. As a follow-up to our discussions of last week, both Toyota and Shell are happy to accommodate your request and delay their meetings until later this December or early January. However, I would like to see if we can schedule the meeting time for each now given that your calendar will no doubt be filling up quickly and the issues both want to raise are time sensitive.
Would it be appropriate for me to follow-up with Shanita or someone else on scheduling meeting dates?
Best,
Stephen

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From: Stephen Fotis
Sent: Wednesday, November 22, 2017 2:46 PM
To: wehrum.bill@epa.gov; wehrum.william@epa.gov
Subject: Follow-up to Your Message on Meeting Requests

Bill – Many thanks for your call last night regarding my two meeting requests. I am now checking with the client in each case but will most likely not be getting back to you with answer until after the Thanksgiving holiday. However, I would

be very surprised if there is anything compelling or urgent that would require scheduling either one of the meetings over the next few weeks.
Have a great Thanksgiving and I will be getting back to you next week.
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Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 11/30/2017 9:35:51 PM
To: Stephen Fotis [scf@vnf.com]
CC: Loving, Shanita [Loving.Shanita@epa.gov]
Subject: Confirmed 12/15 at 3pm: Meeting Requests for Toyota from S. Fotis

Hi Stephen,

You are confirmed for a 45 minute in person meeting on Friday, December 15, 2017 at 3:00pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

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Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.
Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
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Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Meeting Requests for Toyota from S. Fotis

Emily - Friday, December 15, 2017 at 3:00 PM works for Toyota. I will get back to you shortly with the names and titles of those individuals who will be attending the meeting with Bill on behalf of Toyota.
Again, many thanks for all of your assistance here.

Have a great rest of the day.
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Stephen

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Cc: Atkinson, Emily
Subject: RE: Meeting Requests for Toyota and Shell

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Sent: Wednesday, November 22, 2017 2:46 PM
To: wehrum.bill@epa.gov; wehrum.william@epa.gov
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Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 11/30/2017 8:42:58 PM
To: scf@vnf.com
CC: Loving, Shanita [Loving.Shanita@epa.gov]
Subject: FW: Meeting Requests for Toyota from S. Fotis

Hi Stephen,

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Please advise if this could work on your end.

Thank you.
Emily

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Cc: Atkinson, Emily
Subject: RE: Meeting Requests for Toyota and Shell

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Sent: Monday, November 27, 2017 11:29 AM
To: Wehrum, Bill <Wehrum.Bill@epa.gov>; Wehrum, Bill <Wehrum.Bill@epa.gov>
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Sent: Wednesday, November 22, 2017 2:46 PM
To: wehrum.bill@epa.gov; wehrum.william@epa.gov
Subject: Follow-up to Your Message on Meeting Requests

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Message

From: Stephen Fotis [scf@vnf.com]
Sent: 1/21/2018 11:33:25 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]
CC: Loving, Shanita [Loving.Shanita@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]
Subject: RE: Rescheduling Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis

Hi Emily --
Below are names and titles of the individuals who will be attending the Toyota meeting with Bill Wehrum that is scheduled for Tuesday, January 23, 2018 at 10:00am EDT:
Tom Stricker, Vice President, Technical and Regulatory Affairs, Toyota
Fred Turatti, General Manager, Toyota Motor North America
Rick Gezelle, Manager, Technical and Regulatory Affairs
Andrea Campbell, Van Ness Feldman, legal counsel for Toyota
Please let me know if you have any questions, and many thanks for all of your assistance.
Best,
Stephen

From: Stephen Fotis
Sent: Monday, December 11, 2017 3:22 PM
To: 'Atkinson, Emily'
Cc: Loving, Shanita; Lewis, Josh
Subject: RE: Rescheduling Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis

Emily -- I would like to confirm January 23, 2018 at 10:00am EDT for the Toyota meeting with Bill. I will shortly provide you with the names of individuals who will be participating in the meeting on behalf of Toyota.
Many thanks for your assistance!
Stephen

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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Monday, December 11, 2017 3:00 PM
To: Stephen Fotis
Cc: Loving, Shanita; Lewis, Josh
Subject: RE: Rescheduling Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis

Hi Stephen,

Yes, Josh Lewis and I have coordinated on this to review scheduling options and January 23, 2018 at 10:00am EDT is the first available time to slot this meeting in for Bill Wehrum.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Monday, December 11, 2017 2:48 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: RE: Rescheduling Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis

Thanks Emily. In my conversations with Josh earlier today, we were talking about trying to schedule a Toyota meeting with Bill in early January, either at the end of the first week of January (January 4 or 5) or the following week (January 8-12). Before we schedule a meeting for the January 23, I want to confirm that there is no chance of scheduling a meeting during either of these two weeks.
Best,
Stephen

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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Monday, December 11, 2017 2:39 PM
To: Stephen Fotis
Cc: Loving, Shanita; Lewis, Josh
Subject: Rescheduling Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis

Hi Stephen,

It looks like the earliest date we could fit this in is for 45 minutes on Tuesday, January 23, 2018 at 10:00am EDT.

Please advise if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager

Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Friday, December 08, 2017 5:22 PM
To: Lewis, Josh <Lewis.Josh@epa.gov>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>; Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Confirmed 12/15 at 3pm: Meeting Requests for Toyota from S. Fotis

Thanks Josh for your email. I totally understand and very much appreciate your efforts to meet with Toyota. Please let me check with the client and will get back to you on Monday. Have a great weekend.
Best,
Stephen

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From: Lewis, Josh [mailto:Lewis.Josh@epa.gov]
Sent: Friday, December 08, 2017 2:14 PM
To: Stephen Fotis
Cc: Atkinson, Emily; Loving, Shanita
Subject: FW: Confirmed 12/15 at 3pm: Meeting Requests for Toyota from S. Fotis

Hi Stephen,

Bill now will be out of the office next Friday for work travel. We could keep the meeting for Friday (EPA participants would include a combination of the political team – Mandy Gunasekara/David Harlow/maybe others – along with career folks from OTAQ); or, if you want to reschedule with Bill, we'd be looking to early January to schedule. What is your preference?

Josh Lewis
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 564 2095
Cell: 202 329 2291

From: Atkinson, Emily
Sent: Thursday, November 30, 2017 4:36 PM
To: Stephen Fotis <scf@vnf.com>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: Confirmed 12/15 at 3pm: Meeting Requests for Toyota from S. Fotis

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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

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Again, many thanks for all of your assistance here.
Have a great rest of the day.
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Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

This communication may contain information and/or metadata that is legally privileged, confidential or exempt from disclosure. If you are not the intended recipient, please do not read or review the content and/or metadata and do not disseminate, distribute or copy this communication. Anyone who receives this message in error should notify the sender immediately by telephone (202-298-1800) or by return e-mail and delete it from his or her computer.

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, November 29, 2017 11:51 AM
To: Stephen Fotis
Subject: RE: Meeting Requests for Toyota and Shell

Hi Stephen,

We are reviewing scheduling options now and will get back to you shortly.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Tuesday, November 28, 2017 5:32 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

Hi Emily – As suggested by Bill in his email below, I am following up with you regarding the scheduling of two separate meetings with Bill – one with Toyota on the Mid Term Review (MTR) for autos/light duty trucks, and the other with Shell on the OOOOa NSPS reconsideration rulemaking. Could you please advise me as to possible times that we might schedule these meetings? If possible, I'd like to try to schedule meetings for later this December before the holidays. Many thanks for your assistance.
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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From: Wehrum, Bill [mailto:Wehrum.Bill@epa.gov]
Sent: Monday, November 27, 2017 12:29 PM
To: Stephen Fotis
Cc: Atkinson, Emily
Subject: RE: Meeting Requests for Toyota and Shell

Thanks Stephen. I'm copying Emily Atkinson. She can work with you to find times.

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Monday, November 27, 2017 11:29 AM

To: Wehrum, Bill <Wehrum.Bill@epa.gov>; Wehrum, Bill <Wehrum.Bill@epa.gov>
Subject: Meeting Requests for Toyota and Shell

Bill – I hope that you had a good Thanksgiving and had some time to relax. As a follow-up to our discussions of last week, both Toyota and Shell are happy to accommodate your request and delay their meetings until later this December or early January. However, I would like to see if we can schedule the meeting time for each now given that your calendar will no doubt be filling up quickly and the issues both want to raise are time sensitive.
Would it be appropriate for me to follow-up with Shanita or someone else on scheduling meeting dates?
Best,
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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From: Stephen Fotis
Sent: Wednesday, November 22, 2017 2:46 PM
To: wehrum.bill@epa.gov; wehrum.william@epa.gov
Subject: Follow-up to Your Message on Meeting Requests

Bill – Many thanks for your call last night regarding my two meeting requests. I am now checking with the client in each case but will most likely not be getting back to you with answer until after the Thanksgiving holiday. However, I would be very surprised if there is anything compelling or urgent that would require scheduling either one of the meetings over the next few weeks.
Have a great Thanksgiving and I will be getting back to you next week.
Best,
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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Appointment

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 2/5/2018 2:32:32 PM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Charmley, William [charmley.william@epa.gov]; Simon, Karl [Simon.Karl@epa.gov]; Moran, Robin [moran.robin@epa.gov]

Subject: Meet with Motor & Equipment Manufacturers Association (Confirmed)
Attachments: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards ; Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards ; Auto Suppliers Meeting on the Midterm Evaluation for Vehicle GHG Standards
Location: WJC-N 5400 + Video with AA + Dial: Ex. 6 Personal Privacy (PP)

Start: 2/5/2018 9:15:00 PM
End: 2/5/2018 10:00:00 PM
Show Time As: Busy

Re: Midterm Evaluation for Vehicle GHG Standards
To: Bill Wehrum, Chris Grundler, Ben Hengst
Cc: Mandy Gunasekara
Outside Attendees (in person):

1. Laurie Holmes, MEMA
2. Catherine Boland, MEMA
3. Dave Cetola, Johnson Matthey
4. Greg Garr, Umicore
5. Mike Belwood, Arconic
6. Tim Lynch, Morgan Lewis
7. Jennifer Heckmann, DENSO
8. Ana Meuweissen, Bosch
9. Erika Nielson, BW
10. Andrew Kenny, Magna

Confirmed 2/5 at 4:15pm: Auto Su... | Confirmed 2/5 at 4:15pm: Auto Su... | Auto Suppliers Meeting on the ...

Message

From: Laurie Holmes [lholmes@mema.org]
Sent: 2/5/2018 2:18:39 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]
Subject: Auto Suppliers Meeting on the Midterm Evaluation for Vehicle GHG Standards

Good morning Emily,
I have at least one member that cannot make it into DC because of the snowstorm in Detroit last night. Is there anyway we could have a call-in number for this member?

Also, I'd like to add Tim Lynch (Morgan Lewis) to the list of attendees in place of Joe Fengler, Honeywell.

Best,
Laurie

From: Laurie Holmes
Sent: Friday, February 02, 2018 10:56 AM
To: Emily Atkinson (atkinson.emily@epa.gov) <atkinson.emily@epa.gov>
Subject: Auto Suppliers Meeting on the Midterm Evaluation for Vehicle GHG Standards

Emily,
One more thing, attached are a few slides we plan on having hard copies of at the meeting on Monday to provide visuals to our discussion points.
I've provided these to Ann Arbor staff too but thought I'd make sure you were aware.

Best,

Laurie

Laurie Holmes
Senior Director, Environmental Policy
Motor & Equipment Manufacturers Association
1030 15th Street NW, Suite 500 East
Washington, DC 20005
Direct: 202-312-9247
Mobile: 202-422-6182

2018
LEGISLATIVE
SUMMIT
April 10-11 | Washington, DC
www.mema.org/dcsummit

From: Laurie Holmes
Sent: Thursday, February 01, 2018 9:38 AM
To: 'Atkinson, Emily' <Atkinson.Emily@epa.gov>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Emily,
As requested, below is a list of participants for the meeting with Mr. Wehrum at 4:15 on Monday, February 5.
Thank you so much for your assistance in setting up this meeting.

Attendees:

1. Laurie Holmes, MEMA
2. Catherine Boland, MEMA
3. Dave Cetola, Johnson Matthey
4. Greg Garr, Umicore
5. Mike Belwood, Arconic
6. Joseph Fengler, Honeywell
7. Jennifer Heckmann, DENSO
8. Ana Meuweissen, Bosch
9. Erika Nielson, BW
10. Andrew Kenny, Magna

Best,
Laurie

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Thursday, January 18, 2018 3:44 PM
To: Laurie Holmes <lholmes@mema.org>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Laurie,
You are confirmed for a 45 minute in person meeting on Monday, February 5, 2018 at 4:15pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.

Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information. And based on the size of the room we plan to use, you should plan to bring no more than 10 attendees to this meeting.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Thursday, January 18, 2018 3:08 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Emily,
Yes, Mon. Feb. 5 at 4:15 will work for us.

Is there a number limit for the room? We will have some members with us.

Best,
Laurie

Sent from my iPhone

On Jan 18, 2018, at 11:08 AM, Atkinson, Emily <Atkinson.Emily@epa.gov> wrote:

> Hi Laurie,
>
> It looks like Bill Wehrum could be available for a 45 minute in person meeting on Monday, February 5 at 4:15pm.
>
> Please advise if this could work on your end.
>
> Emily
>
> Emily Atkinson
> Management Analyst/Office Manager
> Immediate Office of the Assistant Administrator
> Office of Air and Radiation, USEPA
> Room 5412B, 1200 Pennsylvania Avenue NW
> Washington, DC 20460
> Voice: 202-564-1850
> Email: atkinson.emily@epa.gov

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Wednesday, January 17, 2018 10:34 AM
To: Lewis, Josh <Lewis.Josh@epa.gov>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Josh,
In addition to the week of the 29th we could also do Monday, February 5 or Tuesday, February 6 before 1.
Let me know if you need additional date ranges to work with.
Best,
Laurie

From: Lewis, Josh [mailto:Lewis.Josh@epa.gov]
Sent: Friday, January 12, 2018 2:16 PM
To: Laurie Holmes <lholmes@mema.org>; Catherine Boland <cboland@MEMA.ORG>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: FW: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

+ Emily and – Bill.

Is there a rough date or dates you were looking to come in?

Josh Lewis
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 564 2095
Cell: 202 329 2291

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Friday, January 12, 2018 10:56 AM
To: Wehrum, Bill <Wehrum.Bill@epa.gov>
Cc: Catherine Boland <cboland@MEMA.ORG>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Bill, Thank you so much.
Josh, Look forward to hearing from you.

From: Wehrum, Bill [mailto:Wehrum.Bill@epa.gov]
Sent: Friday, January 12, 2018 7:38 AM
To: Laurie Holmes <lholmes@mema.org>
Cc: Catherine Boland <cboland@MEMA.ORG>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Re: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Laurie. I'd be happy to talk with you. I've copied my chief of staff, Josh Lewis, who can help coordinate.

_____
Bill Wehrum
Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency

(202) 564-7404

On Jan 11, 2018, at 1:33 PM, Laurie Holmes <lholmes@mema.org> wrote:

Bill:
MEMA would like to request a meeting to discuss the midterm evaluation on the vehicle greenhouse gas emission standards.

MEMA represents more than 1,000 companies that manufacture components, systems and materials for motor vehicles and represents the largest sector of manufacturing jobs in the U.S. Since auto suppliers play a major role in developing the technologies necessary for vehicle emission reduction, suppliers have a strong interest in the midterm evaluation and the standards. Our position is also not identical to the vehicle manufactures on the issue.

It would be helpful if we could discuss with you the impact the program has had and will have on our industry.

Look forward to hearing from you.

Laurie Holmes
Senior Director, Environmental Policy
Motor & Equipment Manufacturers Association
1030 15th Street NW, Suite 500 East
Washington, DC 20005
Direct: 202-312-9247
Mobile: 202-422-6182
<image001.png>
April 10-11 | Washington, DC
www.mema.org/dcsummit

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 1/18/2018 8:44:24 PM
To: Laurie Holmes [lholmes@mema.org]
CC: Lewis, Josh [Lewis.Josh@epa.gov]
Subject: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information. And based on the size of the room we plan to use, you should plan to bring no more than 10 attendees to this meeting.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
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Voice: 202-564-1850
Email: atkinson.emily@epa.gov

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To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Emily,
Yes, Mon. Feb. 5 at 4:15 will work for us.

Is there a number limit for the room? We will have some members with us.

Best,
Laurie

Sent from my iPhone

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Hi Laurie,

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Please advise if this could work on your end.

Emily

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Management Analyst/Office Manager
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Office of Air and Radiation, USEPA
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Washington, DC 20460
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Email: atkinson.emily@epa.gov

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Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

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Laurie

From: Lewis, Josh [mailto:Lewis.Josh@epa.gov]
Sent: Friday, January 12, 2018 2:16 PM
To: Laurie Holmes <lholmes@mema.org>; Catherine Boland <cboland@MEMA.ORG>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: FW: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

+ Emily and – Bill.

Is there a rough date or dates you were looking to come in?

Josh Lewis
Chief of Staff

EPA/Office of Air and Radiation
Office: 202 564 2095
Cell: 202 329 2291

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Friday, January 12, 2018 10:56 AM
To: Wehrum, Bill <Wehrum.Bill@epa.gov>
Cc: Catherine Boland <cboland@MEMA.ORG>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Bill, Thank you so much.
Josh, Look forward to hearing from you.

From: Wehrum, Bill [mailto:Wehrum.Bill@epa.gov]
Sent: Friday, January 12, 2018 7:38 AM
To: Laurie Holmes <lholmes@mema.org>
Cc: Catherine Boland <cboland@MEMA.ORG>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Re: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Laurie. I'd be happy to talk with you. I've copied my chief of staff, Josh Lewis, who can help coordinate.

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Bill Wehrum
Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency
(202) 564-7404

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> Bill:
> MEMA would like to request a meeting to discuss the midterm evaluation on the vehicle greenhouse gas emission standards.
>
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> 1030 15th Street NW, Suite 500 East

Washington, DC 20005
Direct: 202-312-9247
Mobile: 202-422-6182
<image001.png>
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Message

From: Laurie Holmes [lholmes@mema.org]
Sent: 2/1/2018 2:38:05 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]
CC: Lewis, Josh [Lewis.Josh@epa.gov]
Subject: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Emily,
As requested, below is a list of participants for the meeting with Mr. Wehrum at 4:15 on Monday, February 5.
Thank you so much for your assistance in setting up this meeting.

Attendees:

1. Laurie Holmes, MEMA
2. Catherine Boland, MEMA
3. Dave Cetola, Johnson Matthey
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Best,
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To: Laurie Holmes <lholmes@mema.org>
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Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

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Senior Director, Environmental Policy
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Washington, DC 20005
Direct: 202-312-9247
Mobile: 202-422-6182
<image001.png>
April 10-11 | Washington, DC
www.mema.org/dcsummit

Message

From: Corey, Richard@ARB [richard.corey@arb.ca.gov]
Sent: 4/2/2018 1:09:38 AM
To: Grundler, Christopher [grundler.christopher@epa.gov]
Subject: RE: I will plan to touch bases with you tomorrow at 7:00 a.m. (PST) for any updates (I will be speaking with Mary shortly thereafter)

Will do. Do you have much background about April 10ths Senate EPW subcommittee hearing on CC roll-backs (Clean Power Plan, methane, probably the FD)? I suspect we will have to send someone. Could be me but I would prefer not. Perhaps our Secretary of Cal/EPA will cover.

Richard

From: Grundler, Christopher [mailto:grundler.christopher@epa.gov]
Sent: Sunday, April 01, 2018 5:18 PM
To: Corey, Richard@ARB
Subject: Re: I will plan to touch bases with you tomorrow at 7:00 a.m. (PST) for any updates (I will be speaking with Mary shortly thereafter)

Hi Richard—
I have a mtg with Bill W at 7:00 am your time. Can you call me before then. I will be in my A2 Office.

C-

Christopher Grundler, Director
Office of Transportation and Air Quality
U.S. Environmental Protection Agency
202.564.1682 (Washington DC)
734.214.4207 (Ann Arbor MI)
734.645.5221 (mobile)
www.epa.gov/otaq

On Apr 1, 2018, at 11:34 AM, Corey, Richard@ARB <richard.corey@arb.ca.gov> wrote:

> Chris,
>
> Let me know if this time does not work and I can call earlier if needed.
>
> Richard

Message

From: Governors' Biofuels Coalition [larry@governorscoalition.org]
Sent: 12/13/2017 4:59:08 PM
To: Grundler, Christopher [grundler.christopher@epa.gov]
Subject: REMINDER: Friday's GBC Conference Call

Please add the Governors' Biofuels Coalition to your address book for uninterrupted delivery
View this email in a web browser.

GOVERNORS'BIOFUELSCOALITION

December 13, 2017

To: State Representatives

From: Larry Pearce, Executive Director

Subject: ***Monthly Conference Call Agenda***

The Coalition's monthly conference call is scheduled for this **Friday, December 15 at 10:00 a.m. CT (11:00 ET, 9:00 MT, and 8:00 PT).** Please call **800-747-5150** and enter code **3951076** to join the call. We will discuss the following topics during our call:

Canada's Use of Higher Ethanol Blends *— Alain Lefebvre, Former Director General, Ministry of Energy and Natural Resources and Director of Strategic Planning, Greenfield Global*

- Ottawa looking at 15 per cent ethanol blend in gasoline, *The National Post* (Nov.2017)
- Canada to adopt national Low Carbon Fuel Standard, *Biofuels Digest* (Nov.2016)

Update: Pathway for states to demonstrate the use of higher ethanol blends in state fleet vehicles *— Larry Pearce, Todd Sneller*

- GBC Letter to Admin Pruitt Requesting Pathway for Use of Higher Ethanol Blends in State Fleet Legacy Vehicles (Aug. 2017)

Proposed legislation requiring EPA to update and release life cycle analysis of corn based ethanol in 2018 — *Doug Durante*

- Soil Power! The Dirty Way to a Green Planet, *NYT* (Dec. 2017)
- Better soil could trap as much planet-warming carbon as transport produces: study, *Reuters* (Nov. 2017)

- USDA Releases New Report on Lifecycle Greenhouse Gas Balance of Ethanol, *USDA* (2017)
- New USDA Lifecycle Assessment of Corn Ethanol Validates UAI's Research, *UAI* (2017)

Washington Update — *Larry Pearce, Doug Durante*

- Governors' March letter to President Trump and conference call with Administrator Pruitt
    - GBC Regulatory Reform Letter to President Trump (March 2017)

- President's meeting with Senators to discuss RFS, RIN prices

    - Pruitt weighs relief for refiners, *E&E*

    - *Trump Open to Biofuel Policy Reform, Senators Say After Meeting, ReutersAdministrator Pruitt's RFS letter to Senators*

- Final 2018 RFS Volume Obligations Rule

    - Pruitt Reverses Course on Biofuels in 2018 RFS Determination, *EESI*

    - EPA stays the course on renewable fuel obligation, *E&E*

- EPA's Ozone Rule Delay

    - 14 states sue EPA for overdue ozone designations, *E&E*

- Midterm Review

    - California Sets Demands for Auto-Emission Talks With Trump, *Bloomberg*

2018 Leadership Team Announcement — *Todd Sneller, Larry Pearce*

Next call 10:00 CT, 11:00 ET, and 8:00 PT Friday, January 19, 2018

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This message was sent to grundler.christopher@epa.gov from larry@governorscoalition.org

Governors' Biofuels Coalition
Governors' Coalition
P.O. Box 94922
Lincoln, NE 68509

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Message

From: Graham Noyes [graham@noyeslawcorp.com]
Sent: 10/4/2017 9:34:21 PM
To: Grundler, Christopher [grundler.christopher@epa.gov]; Graham Noyes [graham@noyeslawcorp.com]
Subject: Copy of Comments Submitted to EPA's GHG Proceeding and NHTSA's CAFE EIS Proceeding
Attachments: Pearson Fuel Part II Comment to EPA GHG Stds 4 Oct 2017.pdf; Pearson Fuel Part II Comment to CAFE EIS 24 Sept 2017 Submitted.pdf

Dear Mr. Grundler,

Though it was a well-attended and lengthy event, you may recall that we spoke briefly at the EPA's public hearing on the Reconsideration of the Final Determination of GHG Standards for MY 2022-25. I submitted a written comment at the public hearing and via the rule making portal. Subsequent to the hearing, I submitted a comment to NHTSA on the environmental impact statement (EIS) that NHTSA is preparing for the corporate average fuel economy (CAFE) standards. I listed you as a cc on the NHTSA comment which was submitted on September 23rd, and so apologize for the delay in relaying it to you. Today, I developed a brief follow up comment (Part II) to the GHG proceeding and included the NHTSA comment due to its relevance to the GHG proceeding. I have attached these two documents to this email.

Please let me know if you would like to discuss these issues at any stage. We have been working on these same issues with the California Air Resources Board, and so I have also provided CARB Executive Officer Richard Corey with a copy of these documents. Though flex fuel vehicles are a small piece of a complex puzzle, I think that E85 and FFVs can contribute to the establishment of a viable national CAFE and GHG program for MY 2022-25 and beyond that CARB will be willing to support, and I plan to work toward this outcome.

Best Regards,

Graham

--
Graham Noyes
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@Graham Noyes

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NOYES LAW CORPORATION

September 23, 2017

James Tamm,
Chief, Fuel Economy Division
National Highway Traffic Safety Administration
U.S. DEPARTMENT OF TRANSPORTATION
Submitted via Federal eRulemaking Portal

RE: Docket No. NHTSA-2017-0069
Pearson Fuels, Part II of EIS Comment

Dear Mr. Tamm:

We appreciate the opportunity to comment regarding the scope of considerations to be addressed in the forthcoming environmental impact statement (EIS) that will analyze the potential environmental impacts of new Corporate Average Fuel Economy (CAFE) standards for model year (MY) 2022-2025 passenger automobiles and light trucks. This comment letter (Comment) is submitted on behalf of Pearson Fuels, the largest supplier of E85 in the California market. This Comment is a supplement to the prior comment filed on behalf of Pearson Fuels in this proceeding, dated September 1, 2017 (Prior Comment).

This Comment provides input to the National Highway and Transportation Safety Administration (NHTSA) and the Environmental Protection Agency (EPA) on six legal and factual issues that relate to the preparation of the EIS, and that pertain to the overall harmonization and development of the CAFE and greenhouse gas (GHG) standards:

1. Under the National Environmental Policy Act, NHTSA and EPA are required to consider reasonable alternatives to the proposed action.
2. Under the National Environmental Policy Act, a CAFE policy structure that enables and incentives the use of ethanol is a reasonable alternative to the proposed action that must be considered in the EIS.
3. In developing the EIS for CAFE, NHTSA and EPA are required by NEPA and Executive Order 13783 to employ the best available peer-reviewed science and economics including lifecycle assessments of ethanol prepared by EPA and the California Air Resources Board.
4. Due to the quality of California's E85 and GHG reduction data, and CARB's unique role in developing National Standards, California's data qualifies as some of the best available scientific data for the development of the EIS.

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5. Current national ethanol data coupled with data from California regarding FFVs, GHG reduction, and E85 pricing and volume contradicts assumptions made by EPA in prior rulemakings and factual determinations.
6. Based on factual evidence regarding E85 volumes, E85 pricing, and the declining manufacture of FFVs, it is imperative for EPA and NHTSA to revisit assumptions underlying the prior CAFE EIS, and for EPA to immediately revisit its F factor guidance.

Summary of Comment

The National Highway and Transportation Safety Administration (NHTSA) is preparing the EIS in accordance with its obligation to develop CAFE standards pursuant to the Energy Policy and Conservation Act of 1975 (EPCA) and the Energy Independence and Security Act of 2007 (EISA). As stated in the Notice of this rulemaking,

> *"The purpose of and need for an agency's action inform the reasonable range of alternatives to be considered in its NEPA analysis. 40 CFR 1502.13. NHTSA sets CAFE standards as part of a comprehensive energy policy established by EPCA (and amended by EISA) with the purposes of conserving petroleum and of addressing energy independence and security by reducing U.S. reliance on foreign oil."*[1]

A review of the Notice reveals that it does not contain a single reference to ethanol. Similarly, NHTSA's EIS analysis for the MY 2017-2025 CAFE standards failed to recognize that the quantity of ethanol substituted for petroleum is a critical policy and environmental variable that merits attention both in the EIS process and in the design of the CAFE policy framework. Since CAFE's fundamental purpose is to reduce U.S. reliance on foreign oil, this Comment asserts that NHTSA is legally obligated to consider various measures to maximize ethanol use in vehicles as a reasonable alternative since ethanol is a proven and feasible means to reduce petroleum imports, to reduce environmental impacts, and to provide significant GHG reduction benefits.

To support its arguments, this Comment provides E85 usage data and E85 pricing information from California due to the available high quality data, and because California is already using ethanol to reduce petroleum imports and GHG emissions. The Comment examines how changes to the CAFE policy framework have already caused both a boom and a bust in the manufacture of flex fuel vehicles (FFVs). Looking forward, it describes how a strategic CAFE policy framework can leverage FFVs and E85 stations as a bridge to facilitate the transition to high-octane vehicles that will reduce costs to consumers and enable fulfillment of EPCA's and EISA's

[1] Notice of Intent to Prepare an Environmental Impact Statement for Model Year 2022-2025 Corporate Average Fuel Economy Standards, 82 Fed. Reg. 34740, at 34742 (July 26, 2017) (hereafter "Notice").

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objectives. It concludes by emphasizing the importance of revisiting E85 and FFV assumptions, and initiating an immediate re-examination of the appropriate F factor for FFVs.

1. **Under the National Environmental Policy Act, NHTSA and EPA are required to consider reasonable alternatives to the proposed action.**

The National Environmental Policy Act (NEPA) provides that:

> *"The Congress authorizes and directs that, to the fullest extent possible: (1) the policies, regulations, and public laws of the United States shall be interpreted and administered in accordance with the policies set forth in this Act [42 USCS §§ 4321 et seq.], and (2) all agencies of the Federal Government shall--*
>
> ***(A)*** *utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision-making which may have an impact on man's environment;*
>
> ***(B)*** *identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by title II of this Act [42 USCS §§ 4341 et seq.], which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision-making along with economic and technical considerations;*
>
> ***(C)*** *include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on--*
>
> ***(i)*** *the environmental impact of the proposed action,*
>
> ***(ii)*** *any adverse environmental effects which cannot be avoided should the proposal be implemented,*
>
> ***(iii)*** *alternatives to the proposed action,*
>
> ***(iv)*** *the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and*
>
> ***(v)*** *any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.*
>
> *Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. (...)*[2]

Pursuant to NEPA, the detailed statement to be prepared for the MY 2022-2025 CAFE standards is an environmental impact statement (EIS). The purpose of preparing an EIS is to ''provide full and fair discussion of significant environmental impacts and [to] inform

[2] 42 USC §4332.

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decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment.'' 40 C.F.R. §1502.1. The agency's overall EIS-related obligation is to ''take a 'hard look' at the environmental consequences before taking a major action.'' *Baltimore Gas & Elec. Co.* v. *Natural Res. Def. Council, Inc.*, 462 U.S. 87, 97, 103 S.Ct. 2246, 76 L.Ed.2d 437 (1983).

Due to the recurring nature of the development of CAFE standards, there are clear indications regarding the range of alternatives that the agency is likely to consider in the pending EIS. NHTSA undertook a similar EIS process with reference to the MY 2017-2025 CAFE standards resulting in a Final Environmental Impact Statement published in July 2012 (CAFE EIS for MY 2017 and Later).[3] During that proceeding, EPA played a crucial role in the NEPA process by serving as a cooperating agency. In particular, NHTSA requested that EPA fulfill the following tasks:

> · *Providing input on determining the significant issues to be analyzed in the EIS from climate change and air quality perspectives.*
> · *Helping NHTSA "identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (§ 1506.3), narrowing the discussion of these issues in the statement to a brief presentation of why they will not have a significant effect on the human environment or providing a reference to their coverage elsewhere." 40 CFR § 501.7(a)(3).*
> · *Participating in coordination meetings, as appropriate.*
> · *Reviewing and commenting on the Draft EIS and the Final EIS before publication.*[4]

Similarly, in the instant proceeding, EPA and NHTSA have indicated from the outset an intention to closely coordinate on the development of the CAFE and GHG Standards. EPA Administrator Scott Pruitt and Transportation Secretary Elaine L. Chao issued a joint notice announcing that EPA would reconsider its prior Final Determination of the Mid-Term Evaluation of GHG Standards in order to allow additional consultation and coordination with NHTSA in support of a national harmonized program.[5] This close coordination and program harmonization provides the opportunity for the agencies to again work closely together in the development of

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[3] U.S. Department of Transportation/ National Highway Transportation Safety Administration, Final Environmental Impact Statement with Appendices, Corporate Average Fuel Economy Standards, Passenger Cars and Light Trucks, Model Years 2017-2025, NHTSA-2010-0131-0285 (July 2012), at https://www.regulations.gov/document?D=NHTSA-2010-0131-0285 (hereafter CAFE EIS for MY 2017 and Later).
[4] Id., at p. 1-10.
[5] Notice of Intention to Reconsider the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022–2025 Light Duty Vehicles, 82 FR 14671 (Mar. 22, 2017).

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the EIS for the CAFE policy framework. Due to EPA's role as a cooperating agency and the interwoven nature of the CAFE and GHG standards, it is anticipated that EPA will again play a major role in the development of this EIS and that EPA's factual determinations will shape the CAFE program in significant respects. Therefore, both NHTSA and EPA are referenced in this Comment.

The Notice cites the CAFE EIS for MY 2017 and Later and indicates NHTSA's intends to undertake a similar methodological approach for the MY 2022-2025 CAFE policy framework and "analyze environmental impacts related to fuel and energy use, emissions and their effects on climate change and the environment, air quality, natural resources, and the human environment."[6] To establish a framework for the 2022-2025 MY analysis,

> *(...) NHTSA plans to analyze the impacts of eight different standards in the Draft EIS: Two points bracketing the possible action alternatives for passenger cars, two points bracketing the possible alternatives for light trucks, a No Action Alternative and a preferred alternative for passenger cars, and a No Action Alternative and a preferred alternative for light trucks.*[7]

The following language in a footnote of the CAFE EIS for MY 2017 and Later establishes that ethanol was not considered as an independent variable in that analysis:

> *[31] NHTSA assumed that the proportions of total fuel production and consumption represented by ethanol and other renewable fuels (such as biodiesel) under each action alternative would be identical to those under the No Action Alternative.*[8]

Similarly, the CAFE EIS for MY 2017 and Later assumed E85 to occur in flexible fuel vehicles at a constant rate of market penetration across all alternative scenarios and did not consider that a CAFE policy framework that incentivized dual fuel flex fuel vehicles that can utilize E85 as a reasonable alternative that would provide additional petroleum reductions and environmental benefits:

> *This EIS assumes a weighted average of flexible fuel vehicles' fuel economy levels when operating on gasoline and on E85 (a blend of 15 percent gasoline and 85 percent ethanol, by volume). In particular, this EIS assumes that flexible fuel vehicles operate on gasoline 85 percent of the time and on E85 the remaining 15 percent of the time.*[9]

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[6] Notice at 34743.
[7] Id.
[8] CAFE EIS for MY 2017-2025, at 2-32.
[9] Id. at 2-10.

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2. Under NEPA, a CAFE policy structure that enables and incentivizes the use of ethanol is a reasonable alternative to the proposed action that must be considered in the EIS.

The bracketing methodology proposed for the MY 2022-2025 CAFE EIS coupled with the methodology utilized in the CAFE EIS for MY 2017 and Later establish that NHTSA and EPA have taken a narrow view regarding the scope of reasonable alternatives available. The agencies plan to focus solely upon the numerical CAFE standard for the various vehicles. The agencies have indicated their intention to exclude from consideration the various aspects of the CAFE policy framework that influence the types of fuels that will be utilized by the resulting US light-duty vehicle fleet.

Such a narrow view of the CAFE policy framework, and the reasonable alternatives available is not warranted under the NEPA statutes, case law, or regulations. As stated by the Council on Environmental Quality, "The phrase 'range of alternatives' refers to the alternatives discussed in environmental documents. It includes all reasonable alternatives, which must be rigorously explored and objectively evaluated, as well as those other alternatives, which are eliminated from detailed study with a brief discussion of the reasons for eliminated them."[10]

The legal question presented is whether NHTSA is obligated under NEPA to consider a CAFE policy structure that incentivizes and enables greater use of ethanol as a replacement fuel for gasoline. As discussed in the Prior Comment, it is conceded that NHTSA is prohibited from considering ethanol in determining what standards would be maximum feasible.[11] However, the statutory constraint on standard setting does not determine whether a CAFE policy framework to maximize ethanol use represents a reasonable alternative that must be evaluated in the EIS. Instead, this issue must be resolved with reference to the nature of the CAFE program and the significance of ethanol with the CAFE program from a policy and environmental standpoint.

Anyone who is truly familiar with the nature of the CAFE program is aware that the devil is indeed in the details of the program. While the numerical standards establish the benchmark requirements, the system for measuring compliance is determined by a myriad of assumptions, testing protocols, calculating factors, credits, multipliers, and caps. These CAFE program components establish whether particular vehicle technologies are favored or disfavored for CAFE compliance purposes, and heavily influence what types of vehicles that automakers will

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[10] Council on Environmental Quality, "Memorandum to Agencies: Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," (March 23, 1981), at question 1A, available at https://energy.gov/sites/prod/files/G-CEQ-40Questions.pdf (last viewed September 24, 2017).

[11] See 49 USC §32902(h).

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manufacture for the US market.

The importance of CAFE program components is well illustrated by the rise and fall of FFV credits in the CAFE program, and the corresponding rise and fall of FFV manufacturing. From an automaker perspective, the value of FFV credits peaked in 2012 under the CAFE program then began a steady decline due to declining calculating factors, credits, and caps.[12] In 2011-2012, FFV production peaked with General Motors, Ford and Chrysler producing approximately 40% of their fleets as FFVs. Other manufacturers produced far fewer FFVs resulting in total U.S. sales of FFVs of 17% in 2011 and 16% in 2012. Since that time, FFV manufacturing has gone into rapid decline with dramatic scale-backs in the number of models available and vehicles manufactured. Regarding the big three US automakers, these companies offered 53 FFV models in 2012 but have since scaled back their FFV offerings to 38 in 2017. While reliable data is not yet publicly available, anecdotal information suggests an even more rapid decline has occurred in the number of FFVs sold in the US in 2016, likely bringing FFV market penetration down to 10% or less of the US market on an annual basis.

Such dramatic program impacts on the market must be considered from both a policy based and environmental perspective in the EIS for MY 2022-2025. From a petroleum displacement and energy security perspective, ethanol has proven to be a highly effective policy tool that displaces petroleum imports on an almost gallon for gallon basis. In 2016, the US consumed over 14 billion gallons of fuel ethanol.[13] According to EIA, the US imported 155 billion gallons of crude oil and finished fuel during this same period.[14] Thus, ethanol reduced dependence on foreign oil imports by approximately 10% in 2016. This is a massive contribution from a public policy standpoint, and is of the same order of magnitude as the entire CAFE program as documented in the Prior Comment. Thus, from a policy standpoint, considering the impact that CAFE policy design has on ethanol demand is fully warranted.

This importance of the CAFE program is heightened due to the barrier to higher ethanol utilization caused by the E10 blend wall. To the extent that ethanol cannot be blended at rates

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[12] The decline in the regulatory compliance value of FFVs is attributable to both statutory and regulatory changes. For NEPA purposes, only regulatory changes qualify as reasonable alternative actions, and all references to alternative CAFE policy frameworks pertain only to regulatory alternatives.

[13] S. Patricia Batres-Marquez, U.S. Ethanol: Production, Consumption, and the Relevance of Increasing Exports (March 31, 2017), available at http://www.agmrc.org/renewable-energy/renewable-energy-climate-change-report/renewable-energy-climate-change-report/april-2017-report/us-ethanol-production-consumption-and-the-relevance-of-increasing-exports/ (last viewed September 24, 2017).

[14] U.S. Energy Information Administration, U.S. Imports of Crude Oil and Petroleum Products, available at https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MTTIMUS1&f=M (last viewed September 24, 2017).

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above 10% in the general gasoline fuel pool, ethanol can only provide further enhancements to energy security and GHG reduction through FFVs capable of receiving high blend ethanol. The US Department of Agriculture (USDA) recognized this opportunity and established the Biofuel Infrastructure Partnership to pay a portion of the costs for blender pumps capable of distributing high ethanol blends including E85. In its 2015 Notice of Funds Availability, USDA made $100M in federal funding available for this purpose.[15] However, by causing the automakers to rapidly phase out FFVs, the current CAFE policy framework is frustrating the USDA's program goal as well as the goals of EPCA and EISA.

Petroleum reduction is only the most obvious of the benefits that ethanol provides to the CAFE program. Regarding the standards themselves, EPA and NHTSA have requested input on a range of topics including the following:

> (CAFE):
> "• *The cost on the producers or purchasers of new motor vehicles or new motor vehicle engines;*
> • *The feasibility and practicability of the standards;*
> • *The impact of the standards on reduction of emissions, oil conservation, energy security, and fuel savings by consumers; (...) and*
> (…)
> (GHG):
> • *The impact of the standards on advanced fuels technology, including but not limited to the potential for high octane blends;*
> • *The availability of realistic technological concepts for improving efficiency in automobiles that consumers demand, as well as any indirect impacts on emissions;*
> • *The advantages or deficiencies in EPA's past approaches to forecasting and projecting automobile technologies, including but not limited to baseline projections for compliance costs, technology penetration rates, technology performance, etc.; (...) and*
> • *Any relevant information in light of newly available information.*"[16]

These program goals will become more attainable by the establishment of a CAFE policy framework that incentives FFVs and the use of ethanol. In particular, it has been widely reported that high-octane blends will facilitate lower cost technological compliance by enabling a host of

[15] 80 FR 34363 (June 16, 2015).
[16] EPA and NHTSA, Request for Comment on Reconsideration of the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022–2025 Light-Duty Vehicles; Request for Comment on Model Year 2021 Greenhouse Gas Emissions Standards, 82 FR 39551, 39553 (August 21, 2017) (hereafter Request for CAFE and GHG Comments).

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advanced engine technologies.[17] As compared to the octane enhancers that can be produced by petroleum refineries, ethanol offers a lower cost alternative that does not contain harmful aromatic components. However, the move to mid level ethanol blends (MLEBs) of E20 to E30 will require vehicles that can utilize these fuels, stations that can deliver these fuels, and a regulatory structure that authorizes the use of these fuels.

FFVs and E85 stations provide a bridge to enable the transition to MLEBs and high-octane vehicles. FFVs are a vehicle bridge as these vehicles can utilize blends of fuel between E10 and E85 today, and thereby provide customers for MLEB stations. E85 stations can serve as an infrastructure bridge in that these existing approved fueling stations have blender pumps or ethanol blending capabilities that can deliver MLEBs as soon as authorized. Finally, E85 fuel provides a regulatory bridge in that this fuel already has regulatory approval and can be used to facilitate the testing, certification and implementation of MLEBs while the high-octane vehicles are under development. These factors suggest that from a policy standpoint, the value of FFVs to the goals of the CAFE and GHG programs needs to be re-evaluated.

Of course, the primary focus of the NEPA process and the development of an EIS is environmental review. The following section of this Comment addresses key aspects of the environmental benefits of maximizing the use of ethanol in the CAFE policy framework.

3. **In developing the EIS for CAFE, NHTSA and EPA are required by NEPA and Executive Order 13783 to employ the best available peer-reviewed science and economics including lifecycle assessments of ethanol prepared by EPA and the California Air Resources Board.**

As referenced above, NEPA requires NHTSA in the preparation of the EIS to, "utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision-making which may have an impact on man's environment."[18] In addition, Executive Order 13783 signed by President Donald J. Trump on March 28, 2017, requires that "necessary and appropriate environmental regulations comply with the law, are of greater benefit than cost, when permissible, achieve environmental improvements for the American people, and are developed through transparent processes that employ the best available peer-reviewed science and economics."[19]

In evaluating a CAFE policy framework that maximizes ethanol consumption as a reasonable

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[17] See generally Office of Energy Efficiency and Renewable Energy, Department of Energy, Co-Optimization of Fuels & Engines, available at https://energy.gov/eere/bioenergy/co-optimization-fuels-engines (last viewed September 24, 2017).
[18] 42 USC §4332(A).
[19] E.O. 13783, Promoting Energy Independence and Economic Growth (March 28, 2017).

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alternative, it is essential that NHTSA and EPA evaluate the greenhouse gas emissions on a lifecycle basis, rather than a narrow tailpipe view. This analysis must be guided by the best available peer-reviewed science including the lifecycle analysis of ethanol that EPA has developed pursuant to the RFS. It is also appropriate to consider the lifecycle and GHG inventory work completed by CARB in implementing California's aggressive policies to reduce emissions of GHG emissions to 40% below 1990 levels by 2030.[20]

There was language in the CAFE EIS for MY 2017 and Later suggesting that NHTSA and EPA did not utilize the best available science on these issues, and actually ignored EPA's own regulatory determinations when developing the analysis. In the section pertaining to Land Use and Development, the EIS stated: "Growing biofuel feedstocks remove carbon dioxide (CO2) from the atmosphere; therefore biofuels can, in theory, reduce GHG emissions relative to fossil fuels. In practice, however, land use change resulting from increased ethanol production could increase GHG emissions and cause other environmental impacts."[21]

This assertion is remarkable and runs counter to EPA's responsibilities under the Renewable Fuel Standard to guard against any land use change for biofuels. The policy framework for the RFS was expanded by EISA, and specifically provides that renewable fuel that is produced by any facility constructed after 2007 must provide at least a 20% reduction in lifecycle GHG emissions compared to gasoline.[22] EPA has developed an extensive RFS regulatory framework to ensure that indirect land use change (ILUC) emissions are taken into account in the evaluation of whether ethanol meets the 20% GHG reduction standard.[23] Thus, EPA has conclusively determined that ethanol does not just reduce GHG emissions in theory, but also in practice.

EPA's endangerment finding relating to the GHG emissions from mobile sources determined that the burning of fossil fuels is transferring massive amounts of carbon into the atmosphere, rapidly increasing carbon dioxide concentrations, and causing global warming, extreme weather events, and ocean acidification.[24] For purposes of developing the EIS for CAFE MY 2022-2025, it is clear that analyzing environmental impacts through the narrow lens of a tailpipe does not meet the standard of the best available peer-reviewed science mandated by Executive Order 13783. Any policy strategy that treats tailpipe GHG emissions from fossil fuels as equivalent to tailpipe emissions from biofuels that reduce lifecycle GHG emissions by 20% or more is fundamentally at odds with EPA's endangerment finding and its approval of ethanol fuels under the RFS.

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[20] California Health & Safety Code §38566.
[21] CAFE EIS for MY 2017 and Later, at 7.1.
[22] 42 USC §7545(o)(2)(A)(i).
[23] See 40 CFR §80.1400 et seq.
[24] EPA, Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 FR 66496 (December 15, 2009).

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4. Due to the quality of California's E85 and GHG reduction data, and CARB's unique role in developing National Standards, California's data qualifies as some of the best available scientific data for the development of the EIS.

This Comment provides specific data regarding the quantity of ethanol used as a transportation fuel in the U.S. and in California, the GHG and petroleum reductions attributable to ethanol, and pricing data from E85 stations in California. The data pertaining to California is of particular value to this proceeding due to its high quality. The California Air Resources Board (CARB) mandates accurate reporting and record-keeping of E85 sales in California, and closely measures the GHG reductions attributable to all ethanol used in the state. By contrast, the E85 figures that NHTSA and EPA have relied upon in CAFE and GHG rulemakings (and in related factual determinations) have been rough estimates derived from total ethanol use quantities coupled with assumptions about the quantity of ethanol that is blended with gasoline at blend levels ranging from 0 to 85 percent. In addition, there is no comprehensive federal GHG inventory of GHG emissions from the transportation measure that accurately monitors the substantial GHG reductions ethanol provides as compared with unblended gasoline.

From a rulemaking standpoint, California data is of particular significance to these proceedings given California's authority to set its own GHG standards. On June 30, 2009, EPA granted California's request for a waiver of preemption under the Clean Air Act to establish its own standards.[25] Thirteen states and the District of Columbia, comprising approximately 40 percent of the light duty vehicle market, have since adopted California's standards.[26] EPA's granting of the waiver permitted California and the other states to proceed with implementing the California emission standards for MYs 2009 and later. After EPA and NHTSA issued their MYs 2012–2016 standards, CARB revised its standards so that compliance with EPA greenhouse gas standards is deemed to be compliance with California's GHG standards.[27]

This harmonization of GHG standards between CARB and EPA facilitated the implementation of a key auto industry goal: a national program that allows manufacturers to meet all of the standards with a single national fleet. In the interest of maximizing regulatory harmonization, NHTSA and EPA worked closely with CARB throughout the development of the proposed rules.

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[25] 74 FR 32744 (July 8, 2009). See also Chamber of Commerce v. EPA, 642 F.3d 192 (D.C. Cir. 2011) (dismissing petitions for review challenging EPA's grant of the waiver).
[26] The Clean Air Act allows other states to adopt California's motor vehicle emissions standards under section 177 if such standards are identical to the California standards for which a waiver has been granted. States are not required to seek EPA approval under the terms of section 177.
[27] See "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles as approved by OAL," March 29, 2010 at 7. Available at http:// www.arb.ca.gov/regact/2010/ghgpv10/oaltp.pdf (last accessed September 23, 2017).

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In announcing its intent to reconsider its GHG standards early this year, EPA stated that, "it is appropriate to reconsider its Final Determination in order to allow additional consultation and coordination with NHTSA in support of a national harmonized program.[28]

One signatory noticeably absent from the Notice to Reconsider the Final Determination was CARB. To the contrary, CARB recently confirmed in its own Midterm Review that the existing standards should not be weakened in any respect. CARB's position is consistent with the original CARB Governing Board resolution whereby California agreed to forego its own waiver authority and join a national program. That resolution stated CARB's commitment to propose to revise its GHG emissions standards for MYs 2017 to 2025 ''to accept compliance with the 2017 through 2025 MY National Program as compliance with California's greenhouse gas emission standards in the 2017 through 2025 model years." However, the same resolution conditioned that acceptance on the Executive Officer's determination "that U.S. EPA has adopted a final rule that at a minimum preserves the greenhouse reductions benefits set forth in U.S. EPA's December 1, 2011 Notice of Proposed Rulemaking for 2017 through 2025 model year passenger vehicles."[29]

Executive Officer Richard Corey has written in CARB's comment to the instant proceeding that,

> *"It is disturbing, in this regard, that CARB has not been included in these discussions. CARB standards cover millions of vehicles across the country in California and in states that have chosen to adopt California standards. NHTSA and EPA committed to collaborate with CARB on developing and implementing a national program for American vehicles. Moving, unilaterally, away from our successful joint effort could shatter the harmonized California and federal emission and fuel economy standards. That would be a bad outcome for the country.*
>
> *We instead invite you to work with us to ensure CAFE and emissions standards stay strong, and get stronger in the years to come, building on the innovation already underway. (...)*
>
> *CARB is prepared to provide its technical and policy expertise from its own continued progress to assist in NHTSA's development of the maximum feasible fuel economy standards the nation deserves."*

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[28] EPA and NHTSA, Notice of Intention to Reconsider the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light Duty Vehicles, 82 FR 14671 (March 22, 2017) (hereafter Notice of Reconsideration).

[29] State of California Air Resources Board, Resolution 12– 11, January 26, 2012, at 20. Available at https://arb.ca.gov/board/res/2012/res12-11.pdf (last accessed September 23, 2017).

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To the extent that NHTSA and EPA determine to modify the CAFE and GHG standards or the corresponding policy framework in any way, it is prudent to consider CARB's technical and policy input as well as California's accurate data on key program metrics. Executive Officer Corey's comment to this proceeding indicates that it is only through such an engagement that the national program will not be shattered by the departure of CARB and the Section 177 states.

5. **Current national ethanol data coupled with data from California regarding FFVs, GHG reduction, and E85 pricing and volume contradicts assumptions made by EPA in prior rulemakings and factual determinations.**

This Comment provides a summary of the ethanol, E85 and FFV data that was included in the Prior Comment of September 1, 2017. Please see the Prior Comment for additional data and background. This section of the Comment also provides supplemental data regarding E85 pricing and highlights the discrepancies between the data and EPA assumptions underlying the CAFE and GHG policy frameworks.

The U.S. Energy Information Administration (EIA) includes biofuels in its reported consumption of petroleum products. According to EIA, the United States consumed a total of 7.19 billion barrels of petroleum products in 2016, an average of about 19.63 million barrels per day.[30] Of this amount, approximately 3.4 billion barrels of motor gasoline were consumed.[31] EIA reports that about 95% of the motor gasoline contained a 10% blend of ethanol.[32] Converting 3.4 billion barrels to gallons results in a figure of 142.8 billion gallons of motor gasoline consumed by the U.S. motorists. Ten percent of this figure represents 14.3 billion gallons of ethanol, and discounting this by 5% percent to reflect the EIA estimate of gasoline not blended with ethanol yields 13.6 billion gallons of ethanol. EIA forecasts that total U.S. ethanol production will reach 1.02 million barrels per day in 2017, a rate equivalent to 15.8 billion annual gallons. Thus there is sufficient U.S. ethanol supply to meet current demand, with additional ethanol production serving as exports or reserves to further enhance U.S. energy security.[33]

The Prior Comment contained as an exhibit a letter from the California Air Resources Board (CARB) verifying that E85 use in California in flex fuel vehicles (FFVs) increased from about

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[30] See "How much oil in consumed in the United States?" U.S. Energy Information website at https://www.eia.gov/tools/faqs/faq.php?id=33&t=6 (last viewed August 25, 2017).
[31] See "U.S. fuel ethanol production continues to grow in 2017," U.S. Energy Information website at https://www.eia.gov/todayinenergy/detail.php?id=32152 (last viewed August 25, 2017).
[32] See "Almost all U.S. gasoline is blended with 10% ethanol," U.S. Energy Information website at https://www.eia.gov/todayinenergy/detail.php?id=26092 (last viewed August 25, 2017).
[33] See "U.S. fuel ethanol production continues to grow in 2017," U.S. Energy Information website at https://www.eia.gov/todayinenergy/detail.php?id=32152 (last viewed August 25, 2017).

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6.5 million gallons in 2012, to over 18.6 million gallons in 2016. Thus E85 demand in California tripled over a five-year period. The Prior Comment emphasized that this E85 growth trend based on precise CARB data provided strong factual evidence that contradicted the assumptions made by the NHTSA and EPA in the rulemaking that set the 2017 and later CAFE and GHG standards.[34] The California data contradicts prior EPA assumptions in the following respects:

- EPA asserts that less than 1% of the fuel that FFVs consume is E85.[35]
- California data demonstrates that E85 constitutes about 3% of the fuel that FFVs consume.
- EPA asserts that FFV drivers do not seek to utilize E85, and that no growth in fuel demand is anticipated.[36]
- California data demonstrates that there has been a dramatic increase in consumer demand for E85, and that demand tripled between 2012 and 2016.

In addition, California pricing data is relevant to the issue of the utility factor and weighting factor assigned to FFVs. EPA found in the Final CAFE and GHG Rule for MY 2017 and later that drivers that own dual fuel compressed natural gas (CNG) and plug in hybrid electric vehicles (PHEVs) can be expected to seek out the alternative fuel for their vehicles because those fuels are less costly per mile, and therefore these vehicles are entitled to favorable utility factors.[37] EPA asserted that E85 may be more costly per mile than conventional fuel and did not establish a utility factor for FFVs.[38]

The pricing data contained in Exhibit A was obtained from GasBuddy.com. According to its website, GasBuddy gathers information regarding gas prices on a daily basis, and, "GasBuddy is the leading source for the most accurate, real-time fuel prices at more than 140,000 gas stations in the U.S., Canada and Australia."[39] The following chart and graph of California E85 pricing, were based on data from 25 representative stations that regularly report prices and offer E85 and CARBOB. This pricing data demonstrates that E85 is being priced at a dramatic discount to

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[34] 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards; 77 Fed. Reg. 62624, at 63125-7 (October 15, 2012) (hereafter "2017 CAFE and GHG Final Rule").
[35] Letter of Byron J. Bunker, Director of Compliance Division, Office of Transportation and Air Quality, U.S. Environmental Protection Agency, "E85 Flexible Fuel Weight Factor for Model Year 2016-2018 Vehicles," at 24 (November 12, 2014) (hereafter F Factor Letter). Available at https://iaspub.epa.gov/otaqpub/display_file.jsp?docid=33581&flag=1 .
[36] 77 FR 62624, at 63130 (October 15, 2012).
[37] Id. at 62827-62828.
[38] Id. at 62829-62830
[39] See https://www.gasbuddy.com/About (last viewed September 24, 2017).

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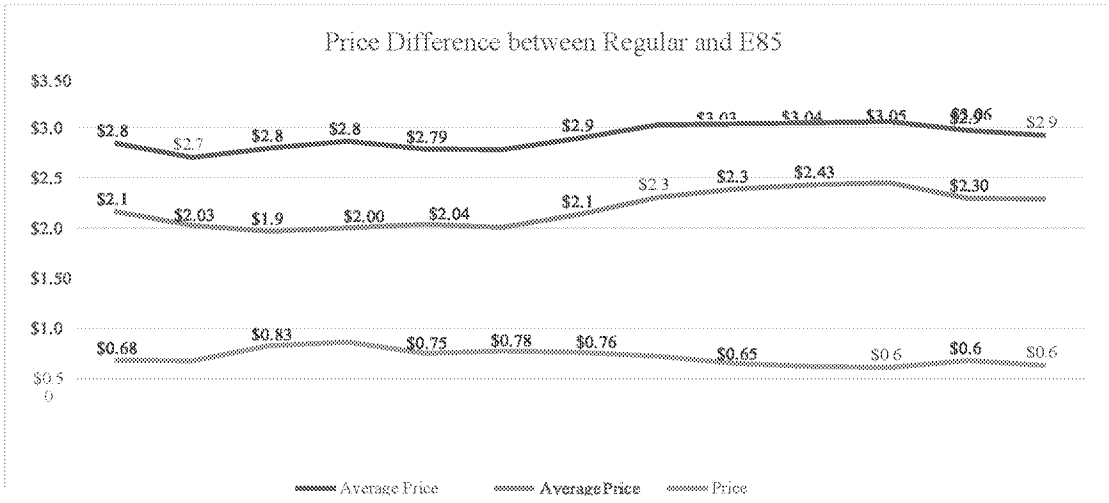
gasoline in California, providing support for a utility factor.



Year	Month	Average Price Regular	Average Price E85	Price Difference
2016	Jul	$ 2.85	$ 2.17	$ 0.68
	Aug	$ 2.71	$ 2.03	$ 0.68
	Sep	$ 2.80	$ 1.97	$ 0.83
	Oct	$ 2.87	$ 2.00	$ 0.87
	Nov	$ 2.79	$ 2.04	$ 0.75
	Dec	$ 2.78	$ 2.01	$ 0.78
2017	Jan	$ 2.90	$ 2.14	$ 0.76
	Feb	$ 3.03	$ 2.31	$ 0.72
	Mar	$ 3.04	$ 2.39	$ 0.65
	Apr	$ 3.05	$ 2.43	$ 0.62
	May	$ 3.06	$ 2.45	$ 0.61
	Jun	$ 2.98	$ 2.30	$ 0.68
	Jul	$ 2.92	$ 2.29	$ 0.63

(See Exhibit A for Underlying Pricing Data)

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6. **Based on factual evidence regarding E85 volumes, E85 pricing, and the declining manufacture of FFVs, it is imperative for EPA and NHTSA to revisit assumptions underlying the prior CAFE EIS, and for EPA to immediately revisit its F factor guidance.**

The most recent determination by EPA regarding the weighting factor (F factor) that establishes the credit provided to automakers for FFVs under the CAFE and GHG standards was made approximately three years ago. It was released in a factual determination dated November 12, 2014. This factual determination is a prime example of a CAFE policy component that either enables or constricts the use of ethanol.

The EPA determination stated,

> *"In the MY 2017-2025 CAFE rulemaking, a new approach for FFVs was established for model years 2020 and later. After MY 2019, under CAFE a manufacturer will weight the FFV fuel economy on conventional gasoline and E85 in its harmonic average of the two values using the same world weighting factor F that is used by manufacturers under the EPA program (rather than assuming a 50/50 weighting). (...) The CAFE program retains the 0.15 divisor for MYs 2020 and later, whereas the GHG program does not include the 0.15 divisor. Retaining the 0.15 divisor in CAFE for dual fuel vehicles is consistent with the procedures established by Congress for dedicated alternative fuel vehicles.* ***As with the EPA program, there is no credit cap in the CAFE program for MY 2020 and later under this new approach finalized in the MY 2017-2025 rule.***[40]

In the guidance document, EPA also noted that:

> *"In the MY 2017-2025 rule, automakers submitted comments requesting early guidance on the F factor so that automakers would have the relevant information needed for development of compliance plans. EPA believes it is important to establish the weighting factor through MY 2018 now to provide manufacturers with as much lead time and certainty as possible for planning for MYs 2016-2018. In the MY 2017-2025 final rule, EPA reiterated its commitment to issue early guidance "well in advance" of each model year.*[41] *As discussed below, EPA plans to revisit the weighting factor for MY 2019. The 0.14 F factor may not be used beyond MY 2018."*[42]

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[40] Letter of Byron J. Bunker, Director of Compliance Division, Office of Transportation and Air Quality, U.S. Environmental Protection Agency, "E85 Flexible Fuel Weight Factor for Model Year 2016-2018 Vehicles," at 10, emphasis supplied (November 12, 2014) (hereafter F Factor Letter). Available at https://iaspub.epa.gov/otaqpub/display_file.jsp?docid=33581&flag=1 .
[41] 77 FR 62624, 62830 (October 15, 2012) (footnote in original).
[42] F Factor Letter, at 8.

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EPA further stated, "An F factor established by EPA for MY 2019 and later will require future agency action that will include an opportunity for public comment. EPA does not view the guidance for MYs 2016-2018 as precedent setting. Determining an F factor is a fact-specific process, to be re-determined based on the facts available at the time EPA issues guidance. EPA will rigorously analyze available data concerning the trends in E85 fuel use and FFV sales in establishing an F factor for model years beyond 2018."[43]

In the scenario that EPA used in its analysis, FFV sales levels decline from the 2012 sales level of 16% to a sales level of 11% in MY 2020 then remain at a plateau of an 11% level through 2030. EPA assumed that "incentives would be sufficient to induce manufacturers to produce larger volumes of FFVs as a fraction of total production into the future."[44] These sales levels are important for F factor calculation purposes because EPA assumed that the more FFVs are manufactured, the less E85 that each vehicle would consume.[45]

Over the three-year period since the F Factor determination was released, all of the key assumptions underlying EPA's analysis have proven false. The following factors in particular warrant an immediate re-examination of the F Factor for MY 2019 and subsequent years:

1. FFVs in California currently consume three times the volume of E85 per vehicle that EPA assumed in its prior analysis;
2. E85 demand has skyrocketed in California with volumes tripling over a five-year period;
3. E85 is priced in California at a substantial discount to regular gasoline, both on a price per gallon and on a price per mile basis; and,
4. EPA's and NHTSA's virtual elimination of the regulatory compliance value of FFVs has caused automakers to phase out one FFV model after another.

Given that MY 2019 vehicles will be in showrooms in one year, EPA has not fulfilled its commitment to issue early guidance "well in advance" of each model year. By not releasing such guidance, EPA has effectively set the F factor for FFVs at zero and completely eliminated the regulatory compliance value of FFVs for CAFE purposes. Pearson Fuels plans to work with other industry stakeholders to both request that EPA revisit that issue, and to submit recent empirical data to assist EPA in its review of this issue.

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[43] Id. at 10.
[44] Id. at 16.
[45] Id. at 13, 16-17.

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NOYES LAW CORPORATION

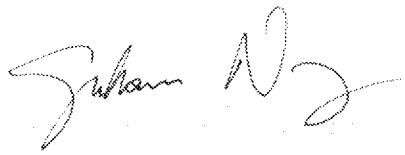
Conclusion

Ethanol has established a proven record as a domestic renewable fuel that displaces petroleum thereby improving energy independence and security, and reducing U.S. dependence on imported foreign oil. In addition, the American ethanol industry has become more efficient from a carbon intensity perspective and is delivering increasing reductions in GHG emissions. California has carefully documented the increased GHG reductions attributable to ethanol and the dramatic growth of E85.

These compelling energy policy and environmental benefits establish that a CAFE policy framework that effectively expands rather than constricts the use of ethanol in the U.S. constitutes a reasonable alternative policy that NHTSA must consider within the scope of its EIS for MY 2022-2025 CAFE standards. This is particularly true given the fact that greater ethanol market penetration beyond E10 is limited by the types of vehicles on the road, and NHTSA CAFE standards substantially influence the vehicle offerings to be provided by the automakers in future years.

Thank you for the opportunity to provide input to the EIS process. Please let me know if you would like to receive any further information or clarification on these issues.

Sincerely,



Graham Noyes

Cc: Christopher Grundler, Director, Office of Transportation and Air Quality
Richard Corey, Executive Officer, California Air Resources Board

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NOYES LAW CORPORATION

October 4, 2017

E. Scott Pruitt
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460

Submitted via Federal eRulemaking Portal

RE: Docket ID No. EPA-HQ-OAR-2015-0827
Pearson Fuels, Part II of Greenhouse Gas Emissions Standards Comment

Dear Administrator Pruitt:

We appreciate the opportunity to comment regarding the Reconsideration of the Final Determination of the Mid-Term Evaluation of Greenhouse Gas (GHG) Emissions Standards for Model Year (MY) 2022-2025 Light-Duty Vehicles and MY 2021 GHG Emission Standards (collectively the GHG Standards). This comment letter (Comment) is submitted on behalf of Pearson Fuels, the largest supplier of E85 in the California market. This Comment supplements the prior comment of Pearson Fuels to this proceeding dated September 5, 2017.

As one of the leading suppliers of E85 fuel in the country, Pearson Fuels' primary interest in this proceeding is to ensure that the policy value of flex fuel vehicles (FFVs) that utilize E85 fuel is properly considered in this proceeding and integrated into the federal policy framework. The policy value of FFVs encompasses the energy security, GHG reduction, and cost savings that these proven vehicles deliver when utilizing E85 fuel; as well as the additional value that FFVs and E85 stations provide as a necessary vehicle and infrastructure bridge to next generation high-octane fuels and high-octane vehicles.

This Comment consists of this brief overview letter coupled with Part II of Pearson Fuels' comment to the National Highway Traffic Safety Administration (NHTSA) relating to NHTSA's preparation of an environmental impact statement (EIS) for the corporate average fuel economy (CAFE) standards (Comment to NHTSA). Pearson Fuels' Comment to NHTSA is submitted to this GHG docket because of EPA's role as a cooperating agency to NHTSA in the National Environmental Policy Act (NEPA) review process, and because of the efforts of NHTSA and EPA to harmonize the GHG and CAFE standards. As a result of the interrelated nature of the GHG and CAFE standards, there are many factual, technical and factual issues in the Comment to NHTSA that pertain to both proceedings.

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NOYES LAW CORPORATION

The following aspects of the attached Comment to NHTSA are particularly germane to this GHG Standards proceeding:

1. In developing the CAFE and GHG standards, NHTSA and EPA are required by NEPA and Executive Order 13783 to employ the best available peer-reviewed science and economics including lifecycle assessments of ethanol prepared by EPA and the California Air Resources Board (CARB).
2. Empirical data from California regarding FFVs, GHG reduction, and E85 pricing and volume contradicts assumptions made by EPA in prior rulemakings and factual determinations. These prior factual determinations underlie current CAFE and GHG credit calculation methodologies for FFVs.
3. Based on the best available peer-reviewed science and empirical evidence, it is appropriate for EPA to revisit its F factor guidance.

We recognize that EPA's F factor guidance constitutes a factual determination by the agency that is appropriately made outside the scope of the CAFE and GHG standards rulemaking processes. We therefore plan to work with eligible manufacturers to follow the process established by 40 C.F.R. §600.510-12(k) to initiate one or more formal requests for F factor determinations from EPA.[1]

Thank you for the opportunity to provide input to the Reconsideration of the Final Determination of the Mid-Term Evaluation of Greenhouse Gas (GHG) Emissions Standards for Model Year (MY) 2022-2025 Light-Duty Vehicles and MY 2021 GHG Emission Standards. Please let me know if any further information would assist EPA in this process.

Sincerely,

Graham Noyes

Cc: Christopher Grundler, Director, Office of Transportation and Air Quality
Richard Corey, Executive Officer, California Air Resources Board

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[1] For EPA's most recent F factor determination, see Letter of Byron J. Bunker, Director of Compliance Division, Office of Transportation and Air Quality, U.S. Environmental Protection Agency, "E85 Flexible Fuel Weight Factor for Model Year 2016-2018 Vehicles," (November 12, 2014), available at https://iaspub.epa.gov/otaqpub/display_file.jsp?docid=33581&flag=1 (last viewed October 4, 2017).

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Message

From: Corey, Richard@ARB [richard.corey@arb.ca.gov]
Sent: 10/31/2017 1:37:24 AM
To: Grundler, Christopher [grundler.christopher@epa.gov]; Cliff, Steve@ARB [Steve.Cliff@arb.ca.gov]
Subject: [SPAM-Sender] RE: Document from DOT listing many rulemaking schedules, including CAFE

That is indeed faster than we were expected. I suspect they are relying on much of the work they did during the MTE process and packaging in regulatory form.

Richard

From: Grundler, Christopher [mailto:grundler.christopher@epa.gov]
Sent: Monday, October 30, 2017 3:44 PM
To: Cliff, Steve@ARB <Steve.Cliff@arb.ca.gov>; Corey, Richard@ARB <richard.corey@arb.ca.gov>
Subject: Fwd: Document from DOT listing many rulemaking schedules, including CAFE

This is news to us. Looks like NHTSA is moving.

Christopher Grundler, Director
Office of Transportation and Air Quality
U.S. Environmental Protection Agency
202.564.1682 (Washington DC)
734.214.4207 (Ann Arbor MI)
Ex. 6 Personal Privacy (PP) mobile)
www.epa.gov/otaq

Begin forwarded message:

From: "Simon, Karl" <Simon.Karl@epa.gov>
Date: October 30, 2017 at 3:15:50 PM EDT
To: "Charmley, William" <charmley.william@epa.gov>, "Grundler, Christopher" <grundler.christopher@epa.gov>, "Hengst, Benjamin" <Hengst.Benjamin@epa.gov>
Subject: RE: Document from DOT listing many rulemaking schedules, including CAFE

Ex. 5 - Deliberative Process

From: Charmley, William
Sent: Monday, October 30, 2017 2:11 PM
To: Grundler, Christopher <grundler.christopher@epa.gov>; Hengst, Benjamin <Hengst.Benjamin@epa.gov>; Simon, Karl <Simon.Karl@epa.gov>
Cc: Moran, Robin <moran.robin@epa.gov>; Olechiw, Michael <olechiw.michael@epa.gov>; Alson, Jeff <alson.jeff@epa.gov>
Subject: Document from DOT listing many rulemaking schedules, including CAFE

Chris,

DOT released a document I believe today that has rulemaking schedule updates for 80 different regulatory actions being developed within DOT.

I

This includes the CAFE program for 2022-2025.

You can see the dates below. An NPRM for review by the DOT Office of the Secretary on November 19, to OMB on December 23, and NPRM signature on March 30, 2018

This is a public domain document, available at: https://www.transportation.gov/sites/dot.gov/files/docs/regulations/288106/october-2017-rulemaking-report.docx

National Highway Traffic Safety Administration

63. **Passenger Car and Light Truck Corporate Average Fuel Economy Standards MYs 2022-2025** Black

Popular Title: CAFE MYs 2022-2025

RIN 2127-AL76

Stage: NPRM

Previous Stage: Notice:07/27/16; End of C/P: 09/26/2016 Undetermined: Publication Date .

Abstract: This rulemaking would address Corporate Average Fuel Economy (CAFE) standards for light trucks and for passenger cars for model years 2022 - 2025. This rulemaking would respond to requirements of the Energy Independence and Security Act of 2007 (EISA), Title 1, Subtitle A, Section 102, as it amends 49 USC 32902, which was signed into law December 19, 2007. The statute requires that corporate average fuel economy standards be prescribed separately for passenger automobiles and non-passenger automobiles to achieve a combined fleet fuel economy of at least 35 mpg by model year 2020. For model years 2021 to 2030, the average fuel economy required to be attained by each fleet of passenger and non-passenger automobiles shall be the maximum feasible for each model year. The law requires the standards be set at least 18 months prior to the start of the model year.

Effects:

Economically Significant
Major

Prompting action: Statute

Legal Deadline: Publish Final Rule : 04/01/2020

Rulemaking Project Initiated: 06/10/2016

Docket Number:

Dates for NPRM:

Milestone	Originally Scheduled Date	New Projected Date	Actual Date
To OST	11/24/2017	11/19/2017	
To OMB	12/30/2017	12/23/2017	
OMB Clearance	03/30/2018	03/23/2018	
Publication Date	06/30/2018	03/30/2018	
End of Comment Period	08/30/2018		

Explanation for any delay: N/A

***Federal Register* Citation for NPRM:** None

Message

From: Graham Noyes [graham@noyeslawcorp.com]
Sent: 10/4/2017 10:37:11 PM
To: Grundler, Christopher [grundler.christopher@epa.gov]
Subject: Re: Copy of Comments Submitted to EPA's GHG Proceeding and NHTSA's CAFE EIS Proceeding

Please note that I have already filed the documents in the docket through the electronic portal. I sent them to you via email as a courtesy copy.

Best Regards,

Graham

On Wed, Oct 4, 2017 at 2:48 PM, Grundler, Christopher <grundler.christopher@epa.gov> wrote:

Thank you for your follow on comments. They will be placed into our docket for this proceeding.

Christopher Grundler, Director

Office of Transportation and Air Quality

U.S. Environmental Protection Agency

202.564.1682 (Washington, DC)

734.214.4207 (Ann Arbor, MI)

From: Graham Noyes [mailto:graham@noyeslawcorp.com]
Sent: Wednesday, October 04, 2017 5:34 PM
To: Grundler, Christopher <grundler.christopher@epa.gov>; Graham Noyes <graham@noyeslawcorp.com>
Subject: Copy of Comments Submitted to EPA's GHG Proceeding and NHTSA's CAFE EIS Proceeding

Dear Mr. Grundler,

Though it was a well-attended and lengthy event, you may recall that we spoke briefly at the EPA's public hearing on the Reconsideration of the Final Determination of GHG Standards for MY 2022-25. I submitted a written comment at the public hearing and via the rule making portal. Subsequent to the hearing, I submitted a comment to NHTSA on the environmental impact statement (EIS) that NHTSA is preparing for the

corporate average fuel economy (CAFE) standards. I listed you as a cc on the NHTSA comment which was submitted on September 23rd, and so apologize for the delay in relaying it to you. Today, I developed a brief follow up comment (Part II) to the GHG proceeding and included the NHTSA comment due to its relevance to the GHG proceeding. I have attached these two documents to this email.

Please let me know if you would like to discuss these issues at any stage. We have been working on these same issues with the California Air Resources Board, and so I have also provided CARB Executive Officer Richard Corey with a copy of these documents. Though flex fuel vehicles are a small piece of a complex puzzle, I think that E85 and FFVs can contribute to the establishment of a viable national CAFE and GHG program for MY 2022-25 and beyond that CARB will be willing to support, and I plan to work toward this outcome.

Best Regards,

Graham

--

Graham Noyes

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@Graham Noyes

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Message

From: Dania Rich-Spencer [drich-spencer@morpace.com]
Sent: 8/28/2017 3:57:25 PM
To: Grundler, Christopher [grundler.christopher@epa.gov]
CC: 'Dania Rich-Spencer' [drich-spencer@morpace.com]
Subject: RE: Supporting Testing for CAFE Midterm Review

Good Morning Mr. Grundler,

Just a quick follow-up, as it appears you were just getting back into the office last week. As I mentioned in my original email, Morpace has a long history working with the automotive OEMs and have recently been very successful in recruiting customers to install a telematics device into their vehicle. We believe we can help you with obtaining real-world consumer driving data to help with the CAFE midterm review.

We are just 30 minutes from Ann Arbor and would love to meet with you in person to discuss how we may be of assistance. How does your calendar look in the next week or so?

Looking forward to meeting you,
Dania

From: Dania Rich-Spencer [mailto:drich-spencer@morpace.com]
Sent: Friday, August 18, 2017 2:24 PM
To: grundler.christopher@epa.gov
Cc: 'Dania Rich-Spencer' <drich-spencer@morpace.com>
Subject: Supporting Testing for CAFE Midterm Review

Hello Mr. Grundler,

My name is Dania Rich-Spencer and I am a Vice President with Morpace, an automotive market research and consulting company located in Farmington Hills, MI.
I saw the August 1, 2017 Automotive News story about the EPA expanding its real-world testing of automotive powertrains as it prepares for the CAFE mid-year review and wanted to reach out.

Morpace has a long history with the automotive OEMs and recently have been very successful with recruiting consumers to participate in telematics data logger projects. These are projects where Morpace recruits the OEM's customers to install a vehicle telematics device and we administer a series of online surveys to better understand the customer's driving behavior and vehicle usage.

I'm reaching out to see if Morpace can help you with obtaining the real-world consumer driving data that the Automotive News article referenced. We have collected vehicle data from hundreds of customers and understand the complexity of the process. Additionally, to support the consumer data related to satisfaction with real-world fuel economy that you are purchasing, Morpace sees value in engaging with consumers longitudinally to gain a deeper understanding of their attitudes and behaviors and how they change over time.

Based on Morpace's automotive expertise and first-hand experience with vehicle telematics data I truly believe we can help the EPA with the testing for the CAFE midterm review. Since we are right down the road from Ann Arbor it is very convenient for us to meet with you in person to discuss how we may be of assistance. Do you have 30 minutes free in the next week or so where we can pay you a visit in Ann Arbor?

Looking forward to connecting,

Dania

Dania Rich-Spencer
Vice President
T 248.539.5267
M 810.599.6054
morpace.com

morpace Market Research and Consulting
Detroit | Los Angeles | London | Shanghai

Morpace is a TOP 50 Global Research Firm
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Message

From: Dania Rich-Spencer [drich-spencer@morpace.com]
Sent: 8/18/2017 6:23:42 PM
To: Grundler, Christopher [grundler.christopher@epa.gov]
CC: 'Dania Rich-Spencer' [drich-spencer@morpace.com]
Subject: Supporting Testing for CAFE Midterm Review

Hello Mr. Grundler,

My name is Dania Rich-Spencer and I am a Vice President with Morpace, an automotive market research and consulting company located in Farmington Hills, MI.
I saw the August 1, 2017 Automotive News story about the EPA expanding its real-world testing of automotive powertrains as it prepares for the CAFE mid-year review and wanted to reach out.

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Based on Morpace's automotive expertise and first-hand experience with vehicle telematics data I truly believe we can help the EPA with the testing for the CAFE midterm review. Since we are right down the road from Ann Arbor it is very convenient for us to meet with you in person to discuss how we may be of assistance. Do you have 30 minutes free in the next week or so where we can pay you a visit in Ann Arbor?

Looking forward to connecting,
Dania

Dania Rich-Spencer
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Message

From: Viera, John (J.J.) [jviera@ford.com]
Sent: 8/14/2017 1:23:23 AM
To: Grundler, Christopher [grundler.christopher@epa.gov]
Subject: FW: Notice to Stakeholders: EPA Administrator Signs Federal Register Notice Opening Comment Period for Mid-term Evaluation Reconsideration

Will be good to get your perspective when we see each other face to face out in Asilomar. Looking forward to connecting. Nice job at Traverse City. Hopefully you landed a free round of golf with that performance.

John J. Viera
Director, Sustainability & Vehicle Environmental Matters
Ford Motor Company
Phone: 313-32-36976 Cell: 313-805-3219
jviera@ford.com

From: Charmley, William [mailto:charmley.william@epa.gov]
Sent: Thursday, August 10, 2017 5:00 PM
Subject: Notice to Stakeholders: EPA Administrator Signs Federal Register Notice Opening Comment Period for Mid-term Evaluation Reconsideration

Dear Stakeholder:

Today EPA Administrator Pruitt has signed a *Federal Register* notice announcing that EPA is reconsidering whether the light-duty vehicle greenhouse gas standards previously established for model years 2022-2025 are appropriate under section 202(a) of the Clean Air Act and inviting stakeholders to submit any comments, data, and information they believe are relevant to the Administrator's reconsideration of the January 2017 Mid-term Evaluation Final Determination and in particular, to highlight any new information. EPA is also requesting comment on the separate question of whether the light-duty vehicle greenhouse gas standards established for model year 2021 remain appropriate, regardless of the agency's decision on the MTE.

The comment period will remain open for 45 days after the publication of the *Federal Register* notice. EPA will also hold a public hearing and will provide details for the public hearing in a future *Federal Register* notice and on the website provided below.

You can download the pre-publication version of the *Federal Register* notice at this website:

https://www.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-greenhouse-gas-ghg

Sincerely,

Bill Charmley
Director
Assessment and Standards Division
Office of Transportation and Air Quality
National Vehicle and Fuel Emissions Laboratory
U.S. Environmental Protection Agency

Ann Arbor, Michigan

Message

From: Grundler, Christopher [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D3BE58C2CC8545D88CF74F3896D4460F-GRUNDLER, CHRISTOPHER]
Sent: 3/29/2018 2:20:47 AM
To: Bill Ross [bross@rossstrategic.com]
CC: Stewart, Gwen [Stewart.Gwen@epa.gov]
Subject: Need to reschedule our check in tomorrow (Thursday)

Hi Bill—

We are on final hours on our midterm evaluation and I need our schedule time tomorrow to focus on this project. We will work to find a time next week on your schedule. In sorry for this late notice.

Hope all is well with you

Cheis

Christopher Grundler, Director
Office of Transportation and Air Quality
U.S. Environmental Protection Agency
202.564.1682 (Washington DC)
734.214.4207 (Ann Arbor MI)
734.645.5221 (mobile)
www.epa.gov/otaq

Message

From: Grundler, Christopher [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D3BE58C2CC8545D88CF74F3896D4460F-GRUNDLER, CHRISTOPHER]
Sent: 4/2/2018 6:39:49 PM
To: Corey, Richard@ARB [richard.corey@arb.ca.gov]
Subject: FW: EPA Administrator Pruitt: GHG Emissions Standards for Cars and Light Trucks Should Be Revised

Well, this is a surprise

Christopher Grundler, Director
Office of Transportation and Air Quality
U.S. Environmental Protection Agency
202.564.1682 (Washington, DC)
734.214.4207 (Ann Arbor, MI)

From: Millett, John
Sent: Monday, April 02, 2018 2:36 PM
To: Grundler, Christopher <grundler.christopher@epa.gov>; Hengst, Benjamin <Hengst.Benjamin@epa.gov>; Birgfeld, Erin <Birgfeld.Erin@epa.gov>; Sutton, Tia <sutton.tia@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Fwd: EPA Administrator Pruitt: GHG Emissions Standards for Cars and Light Trucks Should Be Revised

This went out at 2:30. I was just informed.

Sent from my iPhone

Begin forwarded message:

> **From:** "Block, Molly" <block.molly@epa.gov>
> **Date:** April 2, 2018 at 2:32:15 PM EDT
> **To:** "Millett, John" <Millett.John@epa.gov>, "DeLuca, Isabel" <DeLuca.Isabel@epa.gov>, "Grantham, Nancy" <Grantham.Nancy@epa.gov>
> **Subject: FW: EPA Administrator Pruitt: GHG Emissions Standards for Cars and Light Trucks Should Be Revised**
>
> FYI
>
> **From:** EPA Press Office [mailto:press=epa.gov@cmail19.com] **On Behalf Of** EPA Press Office
> **Sent:** Monday, April 2, 2018 2:30 PM
> **To:** Block, Molly <block.molly@epa.gov>
> **Subject:** EPA Administrator Pruitt: GHG Emissions Standards for Cars and Light Trucks Should Be Revised

U.S. ENVIRONMENTAL PROTECTION AGENCY
NEWS RELEASE
WWW.EPA.GOV/NEWSROOM

EPA Administrator Pruitt: GHG Emissions Standards for Cars and Light Trucks Should Be Revised

WASHINGTON (April 2, 2018) — Today, U.S. Environmental Protection Agency (EPA) Administrator Scott Pruitt is announcing the completion of the Midterm Evaluation (MTE) process for the greenhouse gas (GHG) emissions standards for cars and light trucks for model years 2022-2025, and his final determination that, in light of recent data, the current standards are not appropriate and should be revised. Administrator Pruitt is also announcing the start of a joint process with the National Highway Traffic Safety Administration (NHTSA) to develop a notice and comment rulemaking to set more appropriate GHG emissions standards and Corporate Average Fuel Economy (CAFE) standards.

"The Obama Administration's determination was wrong," **said EPA Administrator Scott Pruitt**. "Obama's EPA cut the Midterm Evaluation process short with politically charged expediency, made assumptions about the standards that didn't comport with reality, and set the standards too high."

Under the Clean Air Act (CAA), EPA sets national standards for vehicle tailpipe emissions of certain pollutants. Through a CAA waiver granted by EPA, California can impose stricter standards for vehicle emissions of certain pollutants than federal requirements. The California waiver is still being reexamined by EPA under Administrator Pruitt's leadership.

"Cooperative federalism doesn't mean that one state can dictate standards for the rest of the country. EPA will set a national standard for greenhouse gas emissions that allows auto manufacturers to make cars that people both want and can afford — while still expanding environmental and safety benefits of newer cars. It is in America's best interest to have a national standard, and we look forward to partnering with all states, including California, as we work to finalize that standard," **said Administrator Pruitt**.

Additional Background

As part of the 2012 rulemaking establishing the model year 2017-2025 light-duty vehicle GHG standards, EPA made a regulatory commitment to conduct a MTE of the standards for MY 2022-2025 no later than April 1, 2018. This evaluation would determine whether the standards remain appropriate or should be made more, or less stringent.

In November 2016, the Obama Administration short-circuited the MTE process and rushed out their final determination on January 12, 2017, just days before leaving office. Since then, the auto industry and other stakeholders sought a reinstatement of the original MTE timeline, so that the Agency could review the latest information.

EPA and the U.S. Department of Transportation announced a reestablishment of the MTE process in March 2017. And, in August 2017, EPA reopened the regulatory docket and asked for additional information and data relevant to assessing whether the GHG emissions standards remain appropriate, including information on: consumer behavior, feedback on modeling approaches, and assessing advanced fuels technologies. EPA also held a public hearing on this topic.

For more information: https://www.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-greenhouse-gas

Visit The EPA's Newsroom

U.S. Environmental Protection Agency
1200 Pennsylvania Avenue Northwest
Washington, D.C. 20004

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Message

From: Grundler, Christopher [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D3BE58C2CC8545D88CF74F3896D4460F-GRUNDLER, CHRISTOPHER]
Sent: 1/17/2018 9:46:25 PM
To: Corey, Richard@ARB [richard.corey@arb.ca.gov]
Subject: Story on CA and MTE

In case you missed this:

California-Trump administration fuel-efficiency talks intensify

Source: By David Shepardson, Reuters • Posted: Wednesday, January 17, 2018

Share this post on:

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DETROIT (Reuters) – California and the Trump administration will hold a series of new talks over fuel efficiency rules as the auto industry still hopes for a deal to retain nationwide requirements.

Officials from the California Air Resources Board are set to meet in Washington this month for another round of discussions on the 2022-2025 fuel-efficiency rules, automakers and government officials said on Tuesday. Environmental Protection Agency chief Scott Pruitt told Reuters last week that more talks are also planned in California in the coming weeks.

California, which touts its environmental agenda and efforts to cut greenhouse gas emissions, has been increasingly at odds with the Trump administration's efforts to roll back environmental regulations.

Automakers want the White House and California to reach agreement on revisions because a legal battle over the rules could result in lengthy uncertainly for the industry. They also want changes to address lower gasoline prices and a shift in U.S. consumer preferences to larger, less fuel-efficient vehicles.

A group representing General Motors Co, Volkswagen AG (VOWG_p.DE), Toyota Motor Corp and other automakers has encouraged more talks between California and federal regulators in hopes an agreement is reached.

In 2011, California's air emissions regulator and the Obama administration reached an agreement with major automakers to nearly double average fleetwide fuel efficiency to more than 50 miles per gallon by 2025, but included a "midterm review" to determine by April 2018 whether the final requirements were feasible.

California, joined by nearly a dozen other states, could seek to enforce existing emissions rules, even if the Trump administration softens the federal 2022-2025 requirements.

Pruitt told Reuters last week that no decisions on the requirements have been made but he hoped national rules would remain. "California doesn't have the authority to set the standards for the rest of the country," Pruitt said.

Asked if EPA would consider withdrawing California's waiver under the Clean Air Act to set its own emission rules, Pruitt said: "There's no reason to speculate on that right now. I think that what's important is that we continue to reach out to work with California."

Reuters first reported earlier this month that the Trump administration met with California officials on Dec. 15 to discuss the programme.

The meeting included EPA air office chief Bill Wehrum, National Highway Traffic Safety Administration (NHTSA) deputy chief Heidi King, and White House aide Mike Catanzaro.

NHTSA plans to issue its proposed changes, if any, for the 2022-25 model years by March 30. The agency is "on track" to meet that deadline, King told Reuters on the sidelines of the Detroit auto show on Tuesday. She expects it to propose "a broad range of options."

In a move widely seen as a preamble to loosening fuel standards, U.S. President Donald Trump announced in March he was revisiting the 2025 requirements.

In June, New York state's attorney general and 12 other top state law officials said they would mount a court challenge to any effort to roll back vehicle fuel rules.

Reporting by David Shepardson in

Christopher Grundler, Director
Office of Transportation and Air Quality
U.S. Environmental Protection Agency
202.564.1682 (Washington, DC)
734.214.4207 (Ann Arbor, MI)

Message

From: Grundler, Christopher [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D3BE58C2CC8545D88CF74F3896D4460F-GRUNDLER, CHRISTOPHER]
Sent: 10/30/2017 10:44:14 PM
To: Steve.Cliff@arb.ca.gov; Richard Corey [richard.corey@arb.ca.gov]
Subject: Fwd: Document from DOT listing many rulemaking schedules, including CAFE

This is news to us. Looks like NHTSA is moving.

Christopher Grundler, Director
Office of Transportation and Air Quality
U.S. Environmental Protection Agency
202.564.1682 (Washington DC)
734.214.4207 (Ann Arbor MI)
Ex. 6 Personal Privacy (PP) (mobile)
www.epa.gov/otaq

Begin forwarded message:

From: "Simon, Karl" <Simon.Karl@epa.gov>
Date: October 30, 2017 at 3:15:50 PM EDT
To: "Charmley, William" <charmley.william@epa.gov>, "Grundler, Christopher" <grundler.christopher@epa.gov>, "Hengst, Benjamin" <Hengst.Benjamin@epa.gov>
Subject: RE: Document from DOT listing many rulemaking schedules, including CAFE

Ex. 5 - Deliberative Process

From: Charmley, William
Sent: Monday, October 30, 2017 2:11 PM
To: Grundler, Christopher <grundler.christopher@epa.gov>; Hengst, Benjamin <Hengst.Benjamin@epa.gov>; Simon, Karl <Simon.Karl@epa.gov>
Cc: Moran, Robin <moran.robin@epa.gov>; Olechiw, Michael <olechiw.michael@epa.gov>; Alson, Jeff <alson.jeff@epa.gov>
Subject: Document from DOT listing many rulemaking schedules, including CAFE

Chris,

DOT released a document I believe today that has rulemaking schedule updates for 80 different regulatory actions being developed within DOT.

This includes the CAFE program for 2022-2025.

You can see the dates below. An NPRM for review by the DOT Office of the Secretary on November 19, to OMB on December 23, and NPRM signature on March 30, 2018

This is a public domain document, available at: https://www.transportation.gov/sites/dot.gov/files/docs/regulations/288106/october-2017-rulemaking-report.docx

National Highway Traffic Safety Administration

63. **Passenger Car and Light Truck Corporate Average Fuel Economy Standards MYs 2022-2025** Black

Popular Title: CAFE MYs 2022-2025

RIN 2127-AL76

Stage: NPRM

Previous Stage: Notice:07/27/16; End of C/P: 09/26/2016 Undetermined: Publication Date .

Abstract: This rulemaking would address Corporate Average Fuel Economy (CAFE) standards for light trucks and for passenger cars for model years 2022 - 2025. This rulemaking would respond to requirements of the Energy Independence and Security Act of 2007 (EISA), Title 1, Subtitle A, Section 102, as it amends 49 USC 32902, which was signed into law December 19, 2007. The statute requires that corporate average fuel economy standards be prescribed separately for passenger automobiles and non-passenger automobiles to achieve a combined fleet fuel economy of at least 35 mpg by model year 2020. For model years 2021 to 2030, the average fuel economy required to be attained by each fleet of passenger and non-passenger automobiles shall be the maximum feasible for each model year. The law requires the standards be set at least 18 months prior to the start of the model year.

Effects:

Economically Significant
Major

Prompting action: Statute

Legal Deadline: Publish Final Rule : 04/01/2020

Rulemaking Project Initiated: 06/10/2016

Docket Number:

Dates for NPRM:

Milestone	Originally Scheduled Date	New Projected Date	Actual Date
To OST	11/24/2017	11/19/2017	
To OMB	12/30/2017	12/23/2017	
OMB Clearance	03/30/2018	03/23/2018	
Publication Date	06/30/2018	03/30/2018	
End of Comment Period	08/30/2018		

Explanation for any delay: N/A

***Federal Register* Citation for NPRM:** None

Message

From: Grundler, Christopher [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D3BE58C2CC8545D88CF74F3896D4460F-GRUNDLER, CHRISTOPHER]
Sent: 10/5/2017 1:19:16 AM
To: Graham Noyes [graham@noyeslawcorp.com]
Subject: Re: Copy of Comments Submitted to EPA's GHG Proceeding and NHTSA's CAFE EIS Proceeding

Roger

Christopher Grundler, Director
Office of Transportation and Air Quality
U.S. Environmental Protection Agency
202.564.1682 (Washington DC)
734.214.4207 (Ann Arbor MI)
734.645.5221 (mobile)
www.epa.gov/otaq

On Oct 4, 2017, at 6:38 PM, Graham Noyes <graham@noyeslawcorp.com> wrote:

> Please note that I have already filed the documents in the docket through the electronic portal. I sent them to you via email as a courtesy copy.
>
> Best Regards,
>
> Graham
>
> On Wed, Oct 4, 2017 at 2:48 PM, Grundler, Christopher <grundler.christopher@epa.gov> wrote:
>
> > Thank you for your follow on comments. They will be placed into our docket for this proceeding.
> >
> > Christopher Grundler, Director
> >
> > Office of Transportation and Air Quality
> >
> > U.S. Environmental Protection Agency
> >
> > 202.564.1682 (Washington, DC)
> >
> > 734.214.4207 (Ann Arbor, MI)
> >
> > **From:** Graham Noyes [mailto:graham@noyeslawcorp.com]
> > **Sent:** Wednesday, October 04, 2017 5:34 PM

To: Grundler, Christopher <grundler.christopher@epa.gov>; Graham Noyes <graham@noyeslawcorp.com>
Subject: Copy of Comments Submitted to EPA's GHG Proceeding and NHTSA's CAFE EIS Proceeding

Dear Mr. Grundler,

Though it was a well-attended and lengthy event, you may recall that we spoke briefly at the EPA's public hearing on the Reconsideration of the Final Determination of GHG Standards for MY 2022-25. I submitted a written comment at the public hearing and via the rule making portal. Subsequent to the hearing, I submitted a comment to NHTSA on the environmental impact statement (EIS) that NHTSA is preparing for the corporate average fuel economy (CAFE) standards. I listed you as a cc on the NHTSA comment which was submitted on September 23rd, and so apologize for the delay in relaying it to you. Today, I developed a brief follow up comment (Part II) to the GHG proceeding and included the NHTSA comment due to its relevance to the GHG proceeding. I have attached these two documents to this email.

Please let me know if you would like to discuss these issues at any stage. We have been working on these same issues with the California Air Resources Board, and so I have also provided CARB Executive Officer Richard Corey with a copy of these documents. Though flex fuel vehicles are a small piece of a complex puzzle, I think that E85 and FFVs can contribute to the establishment of a viable national CAFE and GHG program for MY 2022-25 and beyond that CARB will be willing to support, and I plan to work toward this outcome.

Best Regards,

Graham

--

Graham Noyes

Noyes Law Corporation

www.fuelandcarbonlaw.com

401 Spring Street, Suite 205

Nevada City, CA 95959

(530)264-7157 Direct

(206)856-8784 Cell

graham@noyeslawcorp.com

https://www.linkedin.com/in/grahamnoyes

@Graham Noyes

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--

Graham Noyes
Noyes Law Corporation

www.fuelandcarbonlaw.com

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https://www.linkedin.com/in/grahamnoyes
@Graham Noyes

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Message

From: Grundler, Christopher [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D3BE58C2CC8545D88CF74F3896D4460F-GRUNDLER, CHRISTOPHER]
Sent: 10/4/2017 9:48:04 PM
To: Graham Noyes [graham@noyeslawcorp.com]
Subject: RE: Copy of Comments Submitted to EPA's GHG Proceeding and NHTSA's CAFE EIS Proceeding

Thank you for your follow on comments. They will be placed into our docket for this proceeding.

Christopher Grundler, Director
Office of Transportation and Air Quality
U.S. Environmental Protection Agency
202.564.1682 (Washington, DC)
734.214.4207 (Ann Arbor, MI)

From: Graham Noyes [mailto:graham@noyeslawcorp.com]
Sent: Wednesday, October 04, 2017 5:34 PM
To: Grundler, Christopher <grundler.christopher@epa.gov>; Graham Noyes <graham@noyeslawcorp.com>
Subject: Copy of Comments Submitted to EPA's GHG Proceeding and NHTSA's CAFE EIS Proceeding

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Best Regards,

Graham

--
Graham Noyes
Noyes Law Corporation

www.fuelandcarbonlaw.com

401 Spring Street, Suite 205

Nevada City, CA 95959

(530)264-7157 Direct
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@Graham Noyes

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Message

From: Grundler, Christopher [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D3BE58C2CC8545D88CF74F3896D4460F-GRUNDLER, CHRISTOPHER]
Sent: 9/5/2017 4:20:16 PM
To: Robbie Diamond [RDiamond@secureenergy.org]
Subject: FW: Opinion article in USA Today, September 4, 2017: Adam Lee, Chairman of Lee Auto Malls "Trump shouldn't reconsider fuel economy standards. Hurricane Harvey shows why."

These arguments seem very similar to what your board members have been saying

Christopher Grundler, Director
Office of Transportation and Air Quality
U.S. Environmental Protection Agency
202.564.1682 (Washington, DC)
734.214.4207 (Ann Arbor, MI)

From: Charmley, William
Sent: Tuesday, September 05, 2017 12:15 PM
To: Grundler, Christopher <grundler.christopher@epa.gov>; Moran, Robin <moran.robin@epa.gov>; Olechiw, Michael <olechiw.michael@epa.gov>; Yanca, Catherine <yanca.catherine@epa.gov>; Simon, Karl <Simon.Karl@epa.gov>; Snapp, Lisa <snapp.lisa@epa.gov>; Alson, Jeff <alson.jeff@epa.gov>
Subject: Opinion article in USA Today, September 4, 2017: Adam Lee, Chairman of Lee Auto Malls "Trump shouldn't reconsider fuel economy standards. Hurricane Harvey shows why."

Below is an opinion article from USA Today from Monday (Labor Day).

Mr. Lee's company, Lee Auto Malls, will have a representative testifying at the hearing tomorrow.

Adam Lee is chairman of Lee Auto Malls, which his grandfather founded in 1936 in Lewiston, Maine. He and his partners manage 19 dealerships in eight cities across Maine.

https://usat.ly/2gyizJS

Trump shouldn't reconsider fuel economy standards. Hurricane Harvey shows why.

Adam Lee, Opinion contributor Published 10:00 a.m. ET Sept. 4, 2017 | Updated 2:10 p.m. ET Sept. 4, 2017

Gas guzzlers nearly destroyed my family's auto sales business. Consumers want efficient cars when gas is expensive, but also when it's cheap.

The Trump administration's decision to reconsider 2025 car and truck fuel economy standards feels like déjà vu all over again. We've been here before, and the results were not pretty.

I sell cars. My family has been in the car business for more than 80 years. One of the hardest financial times we have ever had was when the price of oil spiked and stayed high beginning in 2004. Our domestic dealerships were saddled with huge gas-guzzling SUVs and trucks we could not sell. The only thing that saved us was our import dealerships, because they provided fuel-efficient choices. That's what consumers wanted then.

Right now Hurricane Harvey is driving up gas prices, underscoring how risky it is to count on cheap gas. Yet even when the price is low, consumers still want fuel-efficient vehicles. Given the choice between an SUV that gets 20 miles per gallon or one that gets 30, they choose the more fuel-efficient vehicle, all other things being equal. The only reason consumers have that choice is because of the car and light-duty truck standard agreed upon by the National Highway Transportation Safety Administration, the Environmental Protection Agency, California regulators and the automakers back in 2012.

That standard, which set emission and fuel economy goals through 2025, is flexible and based on the size of the vehicle. SUVs and larger vehicles have different, lower standards to meet than sedans or coupes do. So, for example, automakers can choose to only make SUVs, and only meet the lower standards. The automakers' argument, that they can't meet the standards because low gas prices create greater consumer demand for SUVs, doesn't hold water.

What happened in 2004 and crescendoed in 2008, with oil at $140 a barrel, is sure to happen again. Oil prices will spike; it is only a question of when. If we have learned anything in our 100-year plus dependence on oil, it is that the price never stays the same. And we cannot control it — we can only protect ourselves against this volatility by decreasing our dependence on oil. The joint EPA and NHTSA standards are critical to doing just that. Those who argue that our abundant domestic production insulates the U.S. from price spikes do not understand the world oil market. The U.S. might have ample supply, but we cannot control the global price. That is the purview of those whose proven reserves — like Venezuela and Saudi Arabia — far outstrip ours.

That's why our nation needs strong car and truck fuel standards. They help decrease our dependence on oil, reduce the amount we have to pay at the pump, and limit our vulnerability to those who don't like us and the economic disruption they can ensue.

For an auto dealer like me, these standards protect my business. In 2008, the domestic automakers' lack of fuel-efficient choices hurt my bottom line. It helped destroy theirs. We have had new standards for a number of years now and business has been booming. Hard to believe that it was only eight years ago that two of our "Big Three" auto manufacturers were going through bankruptcy.

In November, the Alliance of Automobile Manufacturers called on the president to reopen the completed midterm evaluation and roll back the standards. But Alliance comments last month suggesting support of high fuel economy standards raise the question, why redo the midterm review?

If the standards are rolled back, our automakers won't invest their genius and innovative energy in developing the technology needed to protect consumers and compete in the global auto market. The rest of the world is racing away from oil. France and England recently announced they are banning the internal combustion engine

by 2030. And both mainstream and less conservative analysts agree that new technologies — including self-driving cars, electric vehicles and ride-sharing platforms — are poised to disrupt the automobile industry forever.

The standards agreed to in 2012 are sensible and realistic. Reams of data released in the first — and already completed — midterm evaluation prove it. The automakers have been meeting the standards for much less cost than even the EPA projected, and have been making huge profits. Of course the new Administration deserves the right to review that data again. But it does not have the right to change the facts.

Instead of pouring their time, energy and money into lobbyists set on abrogating their 2012 commitments, our automakers should be racing hard to win the hybrid, fuel cell and electric vehicle market. History proves they won't do it on their own. And if they don't, the rest of us may well end up paying the price, again.

Adam Lee is chairman of Lee Auto Malls, which his grandfather founded in 1936 in Lewiston, Maine. He and his partners manage 19 dealerships in eight cities across Maine.

You can read diverse opinions from our Board of Contributors and other writers on the Opinion front page, on Twitter @USATOpinion and in our daily Opinion newsletter. To respond to a column, submit a comment to letters@usatoday.com.

Message

From: Grundler, Christopher [grundler.christopher@epa.gov]
Sent: 7/11/2017 8:03:03 PM
To: Richard Corey [richard.corey@arb.ca.gov]
Subject: Fwd: Reuters: U.S. EPA chief says to treat diesel emissions cheating 'very aggressively', 7/11/17

Sent from my iPhone

Begin forwarded message:

From: "Sparacino, Jessica" <sparacino.jessica@epa.gov>
Date: July 11, 2017 at 3:45:11 PM EDT
To: "Sorokin, Nicholas" <sorokin.nicholas@epa.gov>, "Sparacino, Jessica" <sparacino.jessica@epa.gov>, "StClair, Christie" <StClair.Christie@epa.gov>, "Hull, George" <Hull.George@epa.gov>, "Millett, John" <Millett.John@epa.gov>, "Grundler, Christopher" <grundler.christopher@epa.gov>, "Bunker, Byron" <bunker.byron@epa.gov>, "Cook, Leila" <cook.leila@epa.gov>, "Cohen, Janet" <cohen.janet@epa.gov>, "Wehrly, Linc" <wehrly.linc@epa.gov>, "Birgfeld, Erin" <Birgfeld.Erin@epa.gov>, "Richards, David" <Richards.David@epa.gov>, "Mylan, Christopher" <Mylan.Christopher@epa.gov>, "Sutton, Tia" <sutton.tia@epa.gov>, "Birgfeld, Erin" <Birgfeld.Erin@epa.gov>, "Starfield, Lawrence" <Starfield.Lawrence@epa.gov>, "Shinkman, Susan" <Shinkman.Susan@epa.gov>, "Brooks, Phillip" <Brooks.Phillip@epa.gov>, "Caballero, Kathryn" <Caballero.Kathryn@epa.gov>, "Meisenbach, Caitlin" <Meisenbach.Caitlin@epa.gov>, "Kane, Rebecca" <Kane.Rebecca@epa.gov>, "Senn, John" <Senn.John@epa.gov>, "Haman, Patricia" <Haman.Patricia@epa.gov>, "Levine, Carolyn" <Levine.Carolyn@epa.gov>, "Kane, Eleanor" <kane.eleanor@epa.gov>, "Aguilar, Victor" <aguilar.victor@epa.gov>, "Valentine, Julia" <Valentine.Julia@epa.gov>, "Cozad, David" <Cozad.David@epa.gov>, AO OPA OMR CLIPS <AO_OPA_OMR_CLIPS@epa.gov>
Subject: Reuters: U.S. EPA chief says to treat diesel emissions cheating 'very aggressively', 7/11/17

Reuters
http://www.reuters.com/article/us-usa-epa-pruitt-autos-idUSKBN19W2CM
U.S. EPA chief says to treat diesel emissions cheating 'very aggressively'
By Valerie Volcovici and David Shepardson, 7/11/17

U.S. Environmental Protection Agency chief Scott Pruitt said the agency must ensure Volkswagen AG's (VOWG_p.DE) excess diesel emissions is not repeated, and will treat improper behavior by automakers "very aggressively."

Since Volkswagen admitted in September 2015 to illegally using software to evade emissions regulations, the EPA has been investigating diesel issues in a number of other automakers including Fiat Chrysler Automobiles NV (FCHA.MI) and Daimler AG (DAIGn.DE).

In March, VW pleaded guilty to three felonies in a U.S. court and faces three years of probation and oversight by a court appointed monitor. The automaker has agreed to spend more than $25 billion on buybacks, fines and environmental efforts.

The U.S. Justice Department sued Fiat Chrysler Automobiles NV in May and accused the Italian-American automaker of illegally using software to bypass emission controls in 104,000 diesel vehicles sold since 2014.

"What VW did was very, very troublesome and we need to make sure it doesn't happen again," Pruitt told Reuters in an interview late Monday.

Pruitt said the agency must take an aggressive stance to deter cheating by automakers.

"Look what VW, and Fiat - you have this Fiat case that is on the horizon as well. The emails and the communications that I'm aware of - it was strategic and intentional and should be dealt with very aggressively," Pruitt said.

Asked whether he thought the Obama administration dealt with Volkswagen too harshly, Pruitt responded: "I wouldn't call what was done too light at all."

Reuters reported in May the Justice Department and EPA obtained internal Fiat emails and other documents written in Italian that look at engine development and emissions issues and that raise significant questions.

The Justice Department suit in May named Fiat Chrysler's unit VM Motori SpA, which designed the engine in question.

Fiat Chrysler Chief Executive Sergio Marchionne said in June the automaker has been working with EPA for months and "is confident of the fact that there was no intention on our part to set up a defeat device that was even remotely similar to what (Volkswagen) had in their cars."

Pruitt added in the interview that the EPA is not currently reviewing California's waiver under the Clean Air Act to set its own vehicle emissions rules.

"We've reached out to the California governor as part of our CAFE midterm review in 2018. I'm hopeful that the state of California, the governor there, will respond with reciprocity and we are working through that process," Pruitt said.

Pruitt said he thinks it is important to have talks with California as they consider whether to revise the 2022 through 2025 vehicle emissions rules.

___

Jessica Sparacino
US Environmental Protection Agency
Office of Public Affairs Intern
(202) 564-5327
WJCN 2502J

Message

From: Dan Byers [globalenergy@uschamber.com]
Sent: 4/3/2018 5:18:12 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: The latest on fuel efficiency standards, energy litigation, and more.....

April Energy Tracker Updates

Dear Mandy:

Below are the latest updates to the Global Energy Institute – Beveridge & Diamond Energy Tracker. Headlining the updates over the last month is today's announcement by EPA Administrator Scott Pruitt that his agency will revise light-duty vehicle fuel efficiency standards.

As a one-stop shop for monitoring key energy policy and litigation activities, the Tracker can also bring you up to speed on less noticed developments as well. Other notable updates last month include:

- *3/12/18:* EPA finalizes proposal to stay deadlines pertaining to stay certain requirements associated with 2016 methane NSPS rule.
- *3/12/18:* Court issues opinion upholding FERC waiver overruling New York's permit denial for Millennium's Valley Lateral pipeline.
- *3/13/18:* EPA issues guidance memo clarifying application of "project netting" determinations associated with New Source Review (NSR) permitting requirements. For a detailed summary of this and related actions, please see this Beveridge and Diamond News Alert.
- *3/16/18:* D.C. Circuit holds oral arguments in challenge to EPA delay of Risk Management Plan regulation (*Air Alliance Houston v. EPA, No. 17-1155*).
- *3/23/18:* U.S. District Court of North Dakota issues order granting states' request to resume litigation on WOTUS rule.
- *3/26/18:* Environmental petitioners file for review of EPA's final action reversing "once-in, always-in" policy under section 112 of the Clean Air Act.
- *3/27/18:* National Highway Traffic Safety Administration proposes to retain civil penalties for auto manufacturer CAFE violations, rejecting Obama Administration proposal to increase fines.
- *4/3/18:* EPA announces completion of the Midterm Evaluation (MTE) process for light duty vehicle GHG standards for model years 2022-2025, determining that current standards are not appropriate and should be revised.

Please share the Tracker updates with co-workers and colleagues interested in following the latest in energy policy!

SHARE

Sincerely,

Dan Byers
Vice President Policy
Global Energy Institute
U.S Chamber of Commerce

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Washington, DC | 20062 US

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Message

From: Amy Harder [amy@axios.com]
Sent: 4/16/2018 9:29:33 AM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Why Trump should redo Obama's fuel standards

View this email in your browser

Good morning, here's my latest here to share and copied below to read: http://axios.link/bCN4

And ICYMI from last week:
Coal executive on big oil: 'They're prostitutes'
Rick Perry dampens prospects of power grid emergency request

Cheers,

Amy

COLUMN / HARDER LINE

Why Trump should redo Obama's fuel standards

Of all the environmental regulations President Trump is rolling back, the one that makes the most sense to rewrite—but not repeal—are the fuel-efficiency standards former President Obama issued in 2012.

The bottom line: That's the conclusion of independent experts, and it's driven by two significant changes we've seen since 2012: lower gasoline prices and the politics of a rushed Obama administration regulatory review.

Gasoline prices have dropped and revived Americans' longstanding preference for pickup trucks and SUVs over smaller, more fuel-efficient cars. The Obama administration also cut short a technical review of the standard in November 2016 after Trump's surprise election victory.

"If we force manufacturers to develop vehicles that consumers don't want to buy, they may end up keeping their existing cars longer and delay the greening of the fleet."

— Rebecca Lindland, analyst with Kelley Blue Book, an automotive research company

Driving the news: The Environmental Protection Agency announced earlier this month that it's going to revise the standard, which was a pillar of President Obama's climate agenda by cutting greenhouse gas emissions from tailpipes. Auto companies must comply based on what consumers buy, not what they make. The rule called on automakers to get to a fleet-wide average of 54.5 miles per gallon by 2025, with a 2018 target of 36.

The actual story on the ground is different. The average stated fuel economy of new vehicles purchased has flatlined at around 25 miles per gallon since October 2014, right when oil prices were dropping partly in response to America's oil boom. This is because consumers have shifted their preferences from cars to bigger vehicles.

By the numbers:

- Gasoline prices averaged $3.80 a gallon in 2012, compared to today's $2.70. "Lower fuel prices mean the standards in the final rule would save drivers less than the EPA projected," said Kevin Book, managing director of ClearView Energy Partners, a nonpartisan research firm.
- In 2013, consumers were buying a roughly even mix of cars and trucks, according to Motor Intelligence. Last year, 63% of new sales were trucks. "That's just an astounding shift in four years," Lindland said.
- Three percent of light-vehicle sales will be electric by 2025, according to a forecast by WARDS Intelligence, up from 0.59% last year. It's a relatively big increase but still a tiny part of the overall mix.

The politics of this particular regulation are messier than average.

- The regulations Obama announced in 2012, with the support of most major automakers, included a midterm review to be completed in April 2018 to consider whether the standard should be altered based on changes in technology and the economy.
- After Trump unexpectedly won the election, Obama's EPA rushed to complete that process a year and a half sooner, concluding the standard should be kept as is.

Experts following the debate say Obama's eleventh-hour move created a hyper-political starting point for already tense negotiations among the Trump administration, automakers and California. That state has a federal waiver to issue tougher standards, and the EPA is considering revoking it.

- "The discussion would be very different if they [Obama's EPA] had not done that and made it political," said Robbie Diamond, executive director of Securing America's Future Energy, a group that supports the standard as a way to reduce U.S. dependence on oil.
- Lindland, who worked with the National Academy of Sciences on the review, called Obama's move "egregious."
- **For the record**, Obama's EPA chief who made this call, Gina McCarthy, said in a statement to me last week that data showed keeping the standard as is would save consumers money and cut carbon emissions.

The whole point of EPA regulations is to protect the environment amid shorter term economic changes. Indeed, gasoline prices are rising and poised to be the highest in four years.

Automakers are asking for more flexibility, but not to wholly repeal the standard. Proponents of keeping it intact, including California's top air regulator Mary Nichols, say they're open to "minor adjustments."

The catch: It's not clear that the Trump administration is actually willing to find a middle ground. That's why critics of EPA Administrator Scott Pruitt, even those who concede some changes may be necessary, are skeptical he would do anything less than a wholescale rollback.

"If you had a government that you thought was seriously trying to cope with a difficult conflict between environmental aspiration and economic goals, you'd really listen. Why should we listen? He rolls back everything. That's what he does. This is not a person one can give the benefit of the doubt to based on his behavior so far."
— William Reilly, EPA administrator under Republican President George H. W. Bush

What's next: We don't yet know whether Trump will use a scalpel or an ax to rewrite the rules, though precedent suggests it'll be the latter. A senior EPA official told me the agency, along with the Transportation Department, is going to issue multiple standard options in the coming months for public comment. The options will range from a near full-scale repeal to a minor rollback, the official said.

Amy
energy reporter, Axios
202.906.9629
@AmyAHarder

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why did I get this? unsubscribe from this list update subscription preferences
Axios · 3100 Clarendon Blvd. · Arlington, VA 22201 · USA

Message

From: Ryan Beene (BLOOMBERG/ NEWSROOM:) [rbeene@bloomberg.net]
Sent: 3/23/2018 3:53:29 PM
To: jdlouhy1@bloomberg.net; Wilcox, Jahan [wilcox.jahan@epa.gov]
CC: Press [Press@epa.gov]; Bowman, Liz [Bowman.Liz@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: Comment requested re auto standards

Thanks!

From: wilcox.jahan@epa.gov At: 03/23/18 11:52:21
To: Jennifer A. Dlouhy (BLOOMBERG/ NEWSROOM:) , Ryan Beene (BLOOMBERG/ NEWSROOM:)
Cc: Press@epa.gov, Bowman.Liz@epa.gov, Gunasekara.Mandy@epa.gov
Subject: RE: Comment requested re auto standards

"The draft determination has been sent to OMB and is undergoing interagency review. A final determination will be signed by April 1, 2018, consistent with the original timeline," Liz Bowman, EPA spokesperson

From: Jennifer A. Dlouhy (BLOOMBERG/ NEWSROOM:) [mailto:jdlouhy1@bloomberg.net]
Sent: Friday, March 23, 2018 11:21 AM
To: Press <Press@epa.gov>
Cc: rbeene@bloomberg.net
Subject: Comment requested re auto standards

Good morning, EPA!

We are writing a story citing people familiar that say EPA has completed a draft final determination finding that the light vehicle greenhouse gas standards for 2022-2025 need to be revised.

The people say that Bill Wehrum plans to visit California next week to discuss the draft conclusion of the midterm evaluation with officials from the California Air Resources Board.

Can we get a comment on this?

Jennifer A. Dlouhy
jdlouhy1@bloomberg.net / jendlouhyenergy@gmail.com
reporterjen@protonmail.com
Desk: 202.807.2159
Cell/Text/Signal: 202.905.3257
Twitter: @jendlouhyhc
Stories: http://bloom.bg/23Crpvk

Message

From: Wilcox, Jahan [wilcox.jahan@epa.gov]
Sent: 3/23/2018 3:52:05 PM
To: Jennifer A. Dlouhy [jdlouhy1@bloomberg.net]; rbeene@bloomberg.net
CC: Press [Press@epa.gov]; Bowman, Liz [Bowman.Liz@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: Comment requested re auto standards

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Can we get a comment on this?

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Jennifer A. Dlouhy
jdlouhy1@bloomberg.net / jendlouhyenergy@gmail.com
reporterjen@protonmail.com
Desk: 202.807.2159
Cell/Text/Signal: 202.905.3257
Twitter: @jendlouhyhc
Stories: http://bloom.bg/23Crpvk

Message

From: Cunningham, Allison [ACunningham@ngvamerica.org]
Sent: 5/18/2018 5:26:25 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Follow Up from Phone Tag/MTE

Hi Mandy,

Happy Friday. I wanted to follow up from the bit of phone tag we played last week regarding Midterm Evaluation. Your voicemail was much appreciated.

NGVAmerica is very appreciative of the Administration's efforts to engage in a data-driven review in order to create an even playing field for all fuel and vehicle types.

We have been working within our membership to prepare comments and technical recommendations, but wanted to see if there was anything else we could do in order to aid EPA's efforts ahead of the initial NPRM? We are very much hoping that the NPRM will leave sufficient room for us to provide the technical input to the rulemaking and wanted to see if we might offer information as to the type of changes we hope will be permitted?

I understand things are moving quickly. If we can provide anything further by means of technical input or support for your efforts, please let me know. I am glad to touch base on phone, 202-578-0141 is my cell.

Thank You,

Allison Cunningham
Director, Federal Government Affairs
NGVAmerica
400 N. Capitol St. NW STE 450, Washington, D.C. 20001
202.824.7363 [o] | 202.578.0141 [m]
acunningham@ngvamerica.org
ngvamerica.org; ngv.com; ngvshow.com

Message

From: Spector, Mike [mike.spector@wsj.com]
Sent: 1/18/2018 3:45:16 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Re: Are we supposed to chat?

Hi Mandy. Left you a message ... hope you had a great holiday and new year. Wanted to check in on midterm review, on background, when you have a second. 212-416-2572 or 313-320-7388.

Best,
Mike

On Wed, Sep 6, 2017 at 4:31 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:

Hey Mike – per our conversation, I'm connecting you with Mike Catanzaro who will also be able to provide some helpful background from the WH perspective.

From: Spector, Mike [mailto:mike.spector@wsj.com]
Sent: Wednesday, September 6, 2017 3:37 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: Are we supposed to chat?

Hi Mandy. Assuming I have the right person, my colleague, John Stoll, said you called earlier and were planning to give me a buzz at 3:30?

--

Mike Spector
The Wall Street Journal
1211 Avenue of the Americas
5th Floor
New York, NY 10036
(212) 416-2572 (office)
(313) 320-7388 (cell)
mike.spector@wsj.com

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(313) 320-7388 (cell)

mike.spector@wsj.com

Message

From: Chris Nevers [CNevers@autoalliance.org]
Sent: 1/8/2018 3:49:18 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: EPA at TRB and possible

Good Morning Mandy,

Thanks again for the earlier discussion on regulatory issues including possible E10 test deadlines. Between the auto shows and the Transportation Research Board (TRB), maybe we can catch up.

Although I will no be attending the TRB http://www.trb.org/Main/Home.aspx, I will be in DC and could swing over. I also noticed both the EPA and ARB are speaking at separate TRB sessions. Will the EPA be adding anything to the record in the below MTE policy discussion?

Improving Road Travel Fuel Efficiency and Emissions, Part 2: Effective Policies (Part 1, Session 408)

Wednesday 8:00 AM- 9:45 AM
Sign in to reveal location
Lectern | AICP Certification

Issues and Policy Considerations for the Light-Duty Vehicle Greenhouse Gas Program's Midterm Evaluation
Robin Moran, U.S. Environmental Protection Agency
P18-20908
Show Abstract

Also, Steve Cliff of ARB is speaking at the TRB.

Lectern Session 341

Toward Zero Emissions by 2050: The Role of Transportation Technology
Steven Cliff, California Air Resources Board, presiding
Lectern | AICP Certification
Energy, Environment, Hot Topic: Resilience and Sustainability
More Details The transportation sector is undergoing tremendous change. Low-cost electric vehicles are on the near-term horizon, new mobility services are gaining momentum, and CAVs promise to upend traditional business models and vehicle use cases. At the same time, literature suggests that achieving the Paris climate agreement goals requires increasing policy ambition and achieving global net carbon neutrality by midcentury. Practical strategies and policy frameworks must be established to guide the evolution of the transportation sector. This session will share the latest insights on emerging vehicle technologies, highlight innovative ideas and partnerships already in progress, and examine potential timelines for achieving zero emissions.

Best Regards,
Chris Nevers
248 794 5002

Message

From: Spector, Mike [mike.spector@wsj.com]
Sent: 1/19/2018 9:55:21 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Re: Are we supposed to chat?

Hey there. 5 pm still looking good? If so, will try your cell then.

On Thu, Jan 18, 2018 at 5:22 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:
Perfect!

Sent from my iPhone

On Jan 18, 2018, at 5:17 PM, Spector, Mike <mike.spector@wsj.com> wrote:

Let's aim for 5 pm tomorrow then as I have the same issue with kiddos. =)

On Thu, Jan 18, 2018 at 5:15 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:
5 pm

Sent from my iPhone

On Jan 18, 2018, at 5:10 PM, Spector, Mike <mike.spector@wsj.com> wrote:

Sure try my cell tonight...or on tomorrow you mean 5 am or 5 pm?

On Thu, Jan 18, 2018 at 5:05 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:
Hey Mike- does later tonight work? I'm booked until I pick up kids and it's easier to chat once they are in bed- so 8:30 or 9? If that's too late, then 5 tomorrow could work.

Sent from my iPhone

On Jan 18, 2018, at 10:46 AM, Spector, Mike <mike.spector@wsj.com> wrote:

Hi Mandy. Left you a message ... hope you had a great holiday and new year. Wanted to check in on midterm review, on background, when you have a second. 212-416-2572 or 313-320-7388.

Best,
Mike

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Sent: Wednesday, September 6, 2017 3:37 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: Are we supposed to chat?

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(313) 320-7388 (cell)
mike.spector@wsj.com

Message

From: Spector, Mike [mike.spector@wsj.com]
Sent: 1/18/2018 10:16:10 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Re: Are we supposed to chat?

Let's aim for 5 pm tomorrow then as I have the same issue with kiddos. =)

On Thu, Jan 18, 2018 at 5:15 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:
5 pm

Sent from my iPhone

On Jan 18, 2018, at 5:10 PM, Spector, Mike <mike.spector@wsj.com> wrote:

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Hi Mandy. Left you a message ... hope you had a great holiday and new year. Wanted to check in on midterm review, on background, when you have a second. 212-416-2572 or 313-320-7388.

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Sent: Wednesday, September 6, 2017 3:37 PM
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Subject: Are we supposed to chat?

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Message

From: Spector, Mike [mike.spector@wsj.com]
Sent: 1/18/2018 10:09:20 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Re: Are we supposed to chat?

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Message

From: Laurie Holmes [lholmes@mema.org]
Sent: 10/18/2017 6:43:23 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Dominguez, Alexander [dominguez.alexander@epa.gov]; Catherine Boland [cboland@MEMA.ORG]
Subject: Meeting Request - Auto Suppliers on Midterm Evaluation of Vehicle GHG Emission Standards

Mandy:
I wanted to circle back on MEMA's request for a meeting on the midterm evaluation on vehicle greenhouse gas emission standards.
Since motor vehicle suppliers play a major role in developing the technologies necessary for vehicle emission reduction, suppliers have a strong interest in the midterm evaluation and the standards.

It would be helpful if we could discuss with your office the impact the program has had on our global competitiveness, job growth and U.S. technological innovation.

Look forward to hearing from you.

Best,
Laurie

Laurie Holmes
Senior Director, Environmental Policy
Motor & Equipment Manufacturers Association
1030 15th Street NW, Suite 500 East
Washington, DC 20005
Direct: 202-312-9247
Mobile: 202-422-6182

From: Laurie Holmes
Sent: Tuesday, October 10, 2017 4:17 PM
To: 'gunasekara.mandy@epa.gov' <gunasekara.mandy@epa.gov>
Cc: 'dominguez.alexander@epa.gov' <dominguez.alexander@epa.gov>
Subject: Request for Meeting - Auto Suppliers on Midterm Evaluation of GHG Vehicle Emissions

Mandy:

I would like to request a meeting in the coming weeks to discuss EPA's reconsideration of the midterm evaluation of the vehicle greenhouse gas emission standards.
As vehicle suppliers we have a strong interest in the midterm evaluation and the vehicle emissions standards. Our position is also not identical to the vehicle manufactures on this issue.
It would be helpful if we could discuss our position and concerns with your office as this process is getting started.

Best,
Laurie

Laurie Holmes
Senior Director, Environmental Policy
Motor & Equipment Manufacturers Association
1030 15th Street NW, Suite 500 East
Washington, DC 20005

Direct: 202-312-9247
Mobile: 202-422-6182

Message

From: Laurie Holmes [lholmes@mema.org]
Sent: 10/23/2017 10:19:16 PM
To: Dominguez, Alexander [dominguez.alexander@epa.gov]
CC: Catherine Boland [cboland@MEMA.ORG]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Meeting Request - Auto Suppliers on Midterm Evaluation of Vehicle GHG Emission Standards

Alex,
Can we do Wednesday, November 15th at 2:00pm.
It will be MEMA staff and several of our members.

Best,
Laurie

From: Dominguez, Alexander [mailto:dominguez.alexander@epa.gov]
Sent: Monday, October 23, 2017 11:04 AM
To: Laurie Holmes <lholmes@mema.org>
Cc: Catherine Boland <cboland@MEMA.ORG>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: RE: Meeting Request - Auto Suppliers on Midterm Evaluation of Vehicle GHG Emission Standards

Laurie,

Would you be available for a call on Friday, November 10th at 11:00AM or the 15th at 2:00PM?

Best,
Alex

Alex Dominguez
Policy Analyst to the Senior Advisors to
the Administrator for Air and Water
U.S. Environmental Protection Agency

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Wednesday, October 18, 2017 2:43 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Cc: Dominguez, Alexander <dominguez.alexander@epa.gov>; Catherine Boland <cboland@MEMA.ORG>
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Message

From: Dominguez, Alexander [dominguez.alexander@epa.gov]
Sent: 10/23/2017 3:03:52 PM
To: Laurie Holmes [lholmes@mema.org]
CC: Catherine Boland [cboland@MEMA.ORG]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: Meeting Request - Auto Suppliers on Midterm Evaluation of Vehicle GHG Emission Standards

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Policy Analyst to the Senior Advisors to
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Message

From: Spector, Mike [mike.spector@wsj.com]
Sent: 1/23/2018 2:45:42 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Re: Are we supposed to chat?

Hi Mandy...when is good today to touch base? Thanks, Mike.

On Thu, Jan 18, 2018 at 5:22 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:
Perfect!

Sent from my iPhone

On Jan 18, 2018, at 5:17 PM, Spector, Mike <mike.spector@wsj.com> wrote:

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Message

From: David Schwietert [DSchwietert@autoalliance.org]
Sent: 1/2/2018 10:48:41 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Chris Nevers [CNevers@autoalliance.org]; Harlow, David [harlow.david@epa.gov]
Subject: Re: Auto Alliance Follow up - E10 test fuel info

Thanks.

Dave

On Jan 2, 2018, at 5:44 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:

David- thank you for the information. David H and I will discuss and followup.

Sent from my iPhone

On Jan 2, 2018, at 5:08 PM, David Schwietert <DSchwietert@autoalliance.org> wrote:

Mandy,

Thank you for your time last year to discuss regulatory reform and other Industry concerns.

One item that we raised in our conversation, was the E10 "testing cliff" and the need for EPA to extend the deadline from 2020MY (Model Year) to potentially 2022MY for the continued use of E0 for CAFE/ GHG testing. We understand that EPA career staff are intending to release test data showing a small decrease in CO2 when testing on E10 instead of E0. We believe this data release is premature and should come out either with the MTE NPRM or a proposal on possible test procedure adjustments that would take into account any MTE related stringency changes. Any early release of data will only serve to solidify opposition to holistic solutions that include lower carbon fuels. Keep in mind, we agree on the need to incorporate E10 test fuels but the manner and time of how that is done warrants consideration – recognizing that there's no environmental degradation with maintaining the E0 test fuel.

I would draw your attention to the following summary of the Alliance comments that were submitted last year to the docket explaining our position on how to handle the E10 test fuel transition:

- Only the E10 test requirement deadline is critical to address at this point.
- Anything beyond addressing the 2020MY test deadline should be part of the MTE.
- <!--[if !supportLists]--><!--[endif]-->Test procedure adjustments that affect stringency, for example by increasing or decreasing tailpipe CO2 from what is measured, should be part of an overall stringency discussion.
- <!--[if !supportLists]--><!--[endif]-->The Alliance would prefer to see an action that delays implementation of E10 for GHG and CAFE testing or similarly allows for continued use of the fuel on which the GHG and CAFE rules were developed back in 2012.

At the bottom of this email is an excerpt from the Alliance comment on the recent EPA MTE request for comments, page 78-79, titled "Re: Request for Comment on Reconsideration of the Final Determination of the Mid Term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022–2025 Light-Duty Vehicles; Request for Comment on Model Year 2021 Greenhouse Gas Emissions Standards (EPA–HQ–OAR–2015–0827; FRL–9966–62–OAR)"

Important questions that need to be addressed if CO2 and CAFE are adjusted beyond that which is already required by statute (CAFE) include:

- <!--[if !supportLists]--><!--[endif]-->How does adjusting what is measured at the tailpipe with E10 test fuel affect different vehicles/ technologies?
- <!--[if !supportLists]--><!--[endif]-->How would differences between manufacturers or technologies be addressed?
- <!--[if !supportLists]--><!--[endif]-->How would adjusting what is measured affect future biofuels? (if manufacturers constantly correct "back" to E0)
- <!--[if !supportLists]--><!--[endif]-->Under this scenario, will there ever be a benefit for biofuels?
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- <!--[if !supportLists]--><!--[endif]-->How does this change the E85 precedent of reporting what you measure?
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- <!--[if !supportLists]--><!--[endif]-->Could the E10 deadline be fixed in the planned EV multiplier and off-cycle NPRM fix? (again, with no data or proposal other than to delay the deadline)

Again, we believe there's utility in EPA incorporating the use of E10 test fuel in the pending Mid Term Evaluation between EPA and U.S. DOT (or subsequent EPA rulemaking). There may even be an opportunity to fix this issue by inserting a new E10 "deadline" in the currently planned NPRM to fix other EPA issues with off cycle and EV multipliers.

Please let me know if you have any questions.

Dave

Excerpt from Alliance Comments:

6.2. Regulatory Changes Needed to Implement Tier 3 E10 Test Fuel
The Alliance most recently addressed the issue of incomplete regulations for implementing the Tier 3 final rule change to test fuels (the "MY 2020 Cliff") in its May 15, 2017 comments to EPA on reducing regulatory burdens. In 2013, EPA finalized the Tier 3 light-duty vehicle emissions final rule regulations, which require the use of 10% ethanol ("E10") test fuel for fuel economy and CAFE testing by MY 2020; however, EPA still has not issued the regulatory changes necessary to enable such testing. This delay has eroded the expected lead time for this changeover, cast doubt on the feasibility of the MY 2020 deadline, and created considerable uncertainty in manufacturers' product development and compliance planning processes.
Industry, in written comments to EPA, has proposed several ways to address the incomplete regulations, ranging from the issuance of a test procedure adjustment concurrent with the Tier 3 final rule to, more recently, the issuance of a standalone, limited-scope rulemaking to postpone the MY 2020 deadline for the test fuel changeover. Given the impending MY 2020 deadline, industry has also urged EPA to simply consider releasing a letter that would have the effect of assuring no adverse action against industry in the absence of updated testing regulations. In discussions regarding the test fuel transition, EPA staff indicated that the assurance letter approach was not considered a viable option, but it was unclear whether this assessment was based on well-defined EPA policy. If EPA concludes that it is not able to issue such a letter, EPA should now issue a limited-scope direct final rule postponing the unworkable deadline now facing EPA and the industry. The direct final rule should contain only the regulatory changes needed to remove the MY 2020 E10 fuel economy and GHG testing requirement, and should not attempt to address test procedure adjustments related to the new fuel. Such adjustments are more properly addressed in actions associated with the MTE.

David Schwietert
Executive Vice President, Federal Government Relations & Public Policy
P: 202-326-5521 | dschwietert@autoalliance.org
<image001.png>

<image002.png> ALLIANCE OF AUTOMOBILE MANUFACTURERS
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Main Fax: 202-326-5567

https://autoalliance.org/

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Message

From: David Schwietert [DSchwietert@autoalliance.org]
Sent: 1/2/2018 10:07:28 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Chris Nevers [CNevers@autoalliance.org]
Subject: Auto Alliance Follow up - E10 test fuel info

Mandy,

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https://autoalliance.org/

Curious to know how the Auto sector impacts your state or district -- Click here. To get a better understanding of how America's automobile industry is one of the most powerful engines driving the U.S. economy, click here.

Message

From: Bethany Davis [bethany@boydengrayassociates.com]
Sent: 9/29/2017 6:28:07 PM
To: Ford, Hayley [ford.hayley@epa.gov]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Dominguez.Alex@epa.gov; Adam Gustafson [gustafson@boydengrayassociates.com]
Subject: RE: Meeting with Administrator Pruitt

Hi Haley,

He is traveling and will not be back until the afternoon. Could we do between 3:00pm and 5:00pm? Alternatively, Friday, Oct. 13 is open except 12:45-2pm.

Thank you,

Bethany Davis Horyn | Special Assistant
BOYDEN GRAY & ASSOCIATES
801 17th ST NW, Suite 350
Washington, DC 20006
Tel: 202-706-5491| Fax: 202-955-0621

From: Ford, Hayley [mailto:ford.hayley@epa.gov]
Sent: Friday, September 29, 2017 2:25 PM
To: Bethany Davis <bethany@boydengrayassociates.com>
Cc: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>; Dominguez.Alex@epa.gov; Adam Gustafson <gustafson@boydengrayassociates.com>
Subject: RE: Meeting with Administrator Pruitt

Hi Bethany,

Thank you for reaching out. I'd be happy to set this up, however, next week is tricky because the Administrator will be traveling most of the week. Could we set something up for Oct 11 instead? He could do 10, 10:30 or 2:45 that day.

Let me know if that works for you. Thank you!

Hayley Ford
Deputy White House Liaison
Office of the Administrator
Environmental Protection Agency
Room: 3309C William Jefferson Clinton North
ford.hayley@epa.gov
Phone: 202-564-2022
Cell: 202-306-1296

From: Bethany Davis [mailto:bethany@boydengrayassociates.com]
Sent: Thursday, September 28, 2017 4:04 PM
To: Ford, Hayley <ford.hayley@epa.gov>
Cc: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>; Dominguez.Alex@epa.gov; Adam Gustafson <gustafson@boydengrayassociates.com>
Subject: Meeting with Administrator Pruitt

Dear Haley,

I'm reaching out on behalf of Ambassador C. Boyden Gray to set up a meeting with Administrator Pruitt regarding the Midterm Evaluation.

We have lots of flexibility next week, including 2:30-4:30pm on Oct. 3, 4 or 5.

Thank you,

Bethany Davis Horyn | Special Assistant
BOYDEN GRAY & ASSOCIATES
801 17th ST NW, Suite 350
Washington, DC 20006
Tel: 202-706-5491| Fax: 202-955-0621

Message

From: Ford, Hayley [ford.hayley@epa.gov]
Sent: 9/29/2017 6:24:46 PM
To: Bethany Davis [bethany@boydengrayassociates.com]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Dominguez.Alex@epa.gov; Adam Gustafson [gustafson@boydengrayassociates.com]
Subject: RE: Meeting with Administrator Pruitt

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Thank you,

Bethany Davis Horyn | Special Assistant
BOYDEN GRAY & ASSOCIATES
801 17th ST NW, Suite 350
Washington, DC 20006
Tel: 202-706-5491| Fax: 202-955-0621

Message

From: Laurie Holmes [lholmes@mema.org]
Sent: 11/8/2017 6:52:36 PM
To: Dominguez, Alexander [dominguez.alexander@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Auto Suppliers Call Tomorrow at 1:00 on Midterm Evaluation of Vehicle GHG Emission Standards
Attachments: MEMA Pruitt Call Nov 9_ Final.pptx

Mandy and Alex,
We are looking forward to our call tomorrow at 1:00pm. Thank you for agreeing to speak with us. Attached are a few slides we put together that provide visuals of the points we will touch on tomorrow.

Our members that will be joining us on the call include AISIN, Arconic, Robert Bosch, BorgWarner, DENSO, MAGNA, SABIC, and Umicore.

Best,

Laurie Holmes
Senior Director, Environmental Policy
Motor & Equipment Manufacturers Association
1030 15th Street NW, Suite 500 East
Washington, DC 20005
Direct: 202-312-9247
Mobile: 202-422-6182

From: Dominguez, Alexander [mailto:dominguez.alexander@epa.gov]
Sent: Wednesday, October 25, 2017 6:12 PM
To: Laurie Holmes <lholmes@mema.org>
Subject: RE: Meeting Request - Auto Suppliers on Midterm Evaluation of Vehicle GHG Emission Standards

Great – Confirmed for Thursday, November 9th at 1:00PM.

Conference Line: 866-299-3188
Passcode: 202-564-6082

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Wednesday, October 25, 2017 6:04 PM
To: Dominguez, Alexander <dominguez.alexander@epa.gov>
Subject: RE: Meeting Request - Auto Suppliers on Midterm Evaluation of Vehicle GHG Emission Standards

Alex,
Ok, let's schedule a call for November 9th at 1:00pm.
You'll send call information?

From: Dominguez, Alexander [mailto:dominguez.alexander@epa.gov]
Sent: Wednesday, October 25, 2017 4:02 PM
To: Laurie Holmes <lholmes@mema.org>
Subject: RE: Meeting Request - Auto Suppliers on Midterm Evaluation of Vehicle GHG Emission Standards

She is unfortunately unavailable the rest of the day on the 9th.

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Wednesday, October 25, 2017 11:49 AM
To: Dominguez, Alexander <dominguez.alexander@epa.gov>
Cc: Catherine Boland <cboland@MEMA.ORG>
Subject: RE: Meeting Request - Auto Suppliers on Midterm Evaluation of Vehicle GHG Emission Standards

Alex,
Is there any way possible we could do something the morning of the 9th?

From: Dominguez, Alexander [mailto:dominguez.alexander@epa.gov]
Sent: Wednesday, October 25, 2017 11:32 AM
To: Laurie Holmes <lholmes@mema.org>
Cc: Catherine Boland <cboland@MEMA.ORG>
Subject: RE: Meeting Request - Auto Suppliers on Midterm Evaluation of Vehicle GHG Emission Standards

Would a 1:00 call on the 9th work?

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Tuesday, October 24, 2017 4:28 PM
To: Dominguez, Alexander <dominguez.alexander@epa.gov>
Cc: Catherine Boland <cboland@MEMA.ORG>
Subject: Meeting Request - Auto Suppliers on Midterm Evaluation of Vehicle GHG Emission Standards

Alex,
Unfortunately we can't do either of those days. Do you have any availability on the 9th?

Laurie

From: Dominguez, Alexander [mailto:dominguez.alexander@epa.gov]
Sent: Tuesday, October 24, 2017 2:58 PM
To: Laurie Holmes <lholmes@mema.org>
Cc: Catherine Boland <cboland@MEMA.ORG>
Subject: RE: Meeting Request - Auto Suppliers on Midterm Evaluation of Vehicle GHG Emission Standards

Laurie – Apologies I was notified a few hours ago Mandy is going to be on work-related travel the week of the 13th.

Could you all do:

7th at 9:30 or 10:00
8th at 9:00 or 1:30

Alex

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Monday, October 23, 2017 6:19 PM
To: Dominguez, Alexander <dominguez.alexander@epa.gov>
Cc: Catherine Boland <cboland@MEMA.ORG>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: Meeting Request - Auto Suppliers on Midterm Evaluation of Vehicle GHG Emission Standards

Alex,

Can we do Wednesday, November 15th at 2:00pm.
It will be MEMA staff and several of our members.

Best,
Laurie

From: Dominguez, Alexander [mailto:dominguez.alexander@epa.gov]
Sent: Monday, October 23, 2017 11:04 AM
To: Laurie Holmes <lholmes@mema.org>
Cc: Catherine Boland <cboland@MEMA.ORG>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: RE: Meeting Request - Auto Suppliers on Midterm Evaluation of Vehicle GHG Emission Standards

Laurie,

Would you be available for a call on Friday, November 10th at 11:00AM or the 15th at 2:00PM?

Best,
Alex

Alex Dominguez
Policy Analyst to the Senior Advisors to
the Administrator for Air and Water
U.S. Environmental Protection Agency

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Wednesday, October 18, 2017 2:43 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Cc: Dominguez, Alexander <dominguez.alexander@epa.gov>; Catherine Boland <cboland@MEMA.ORG>
Subject: Meeting Request - Auto Suppliers on Midterm Evaluation of Vehicle GHG Emission Standards

Mandy:
I wanted to circle back on MEMA's request for a meeting on the midterm evaluation on vehicle greenhouse gas emission standards.
Since motor vehicle suppliers play a major role in developing the technologies necessary for vehicle emission reduction, suppliers have a strong interest in the midterm evaluation and the standards.

It would be helpful if we could discuss with your office the impact the program has had on our global competitiveness, job growth and U.S. technological innovation.

Look forward to hearing from you.

Best,
Laurie

Laurie Holmes
Senior Director, Environmental Policy
Motor & Equipment Manufacturers Association
1030 15th Street NW, Suite 500 East
Washington, DC 20005
Direct: 202-312-9247
Mobile: 202-422-6182

From: Laurie Holmes
Sent: Tuesday, October 10, 2017 4:17 PM
To: 'gunasekara.mandy@epa.gov' <gunasekara.mandy@epa.gov>
Cc: 'dominguez.alexander@epa.gov' <dominguez.alexander@epa.gov>
Subject: Request for Meeting - Auto Suppliers on Midterm Evaluation of GHG Vehicle Emissions

Mandy:

I would like to request a meeting in the coming weeks to discuss EPA's reconsideration of the midterm evaluation of the vehicle greenhouse gas emission standards.
As vehicle suppliers we have a strong interest in the midterm evaluation and the vehicle emissions standards. Our position is also not identical to the vehicle manufactures on this issue.
It would be helpful if we could discuss our position and concerns with your office as this process is getting started.

Best,
Laurie

Laurie Holmes
Senior Director, Environmental Policy
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1030 15th Street NW, Suite 500 East
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Mobile: 202-422-6182

DRIVING THE FUTURE
U.S. Environmental Protection Agency
Office of the Administrator
November 9, 2017
MEMA

Agenda

I. Introductions
- A. MEMA: Who We Are
- B. Introduction of Represented Suppliers

II. Supplier Economic Impacts

III. Supplier Investment Risks and Need for Certainty

IV. Long-term Targets Drive Technology Innovation

V. Support of Off-Cycle Technology Credits, Other Flexibilities

VI. MEMA Priorities

MOTOR VEHICLE PARTS SUPPLIERS ARE THE **LARGEST** SECTOR OF **MANUFACTURING JOBS** IN THE **U.S.**

871,000
AMERICANS
EMPLOYED
IN **2015**

4.26 MILLION

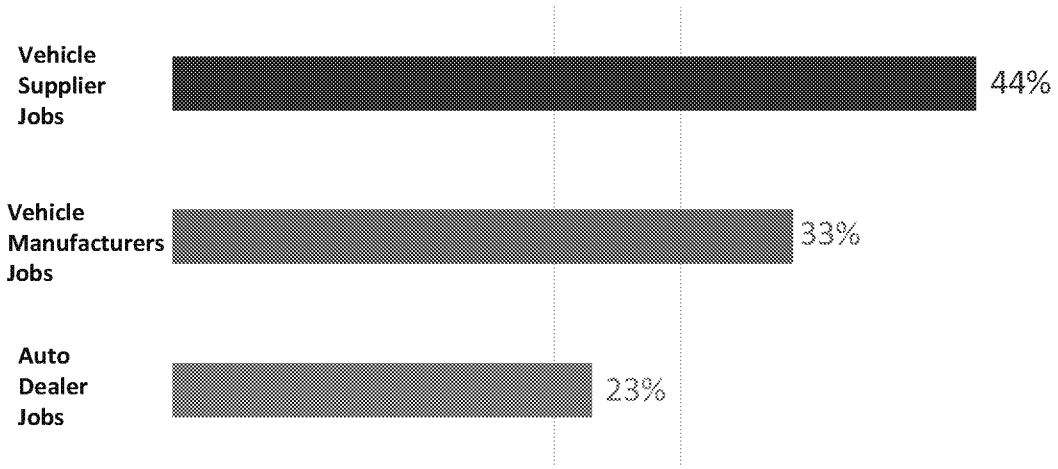
Total employment impact of the motor vehicle parts manufacturing industry in the U.S. – rising nearly 18% from 3.62 million in 2012

MOTOR VEHICLE MANUFACTURING JOBS GREW MORE THAN **19%** SINCE **2012**

All data from "The Employment and Economic Impact of the Vehicle Supplier Industry in the U.S." based on research undertaken by IHS Markit on behalf of MEMA

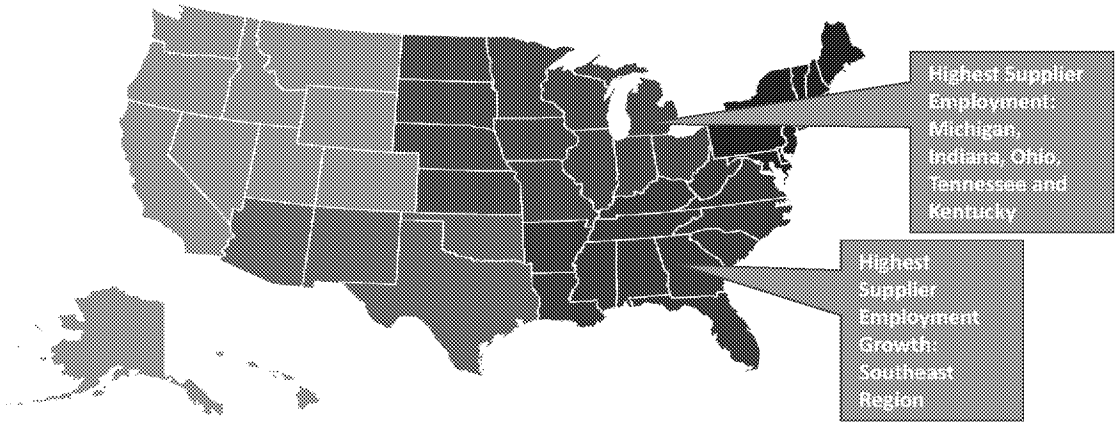
3

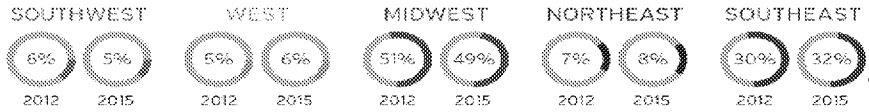
Suppliers Make Up the Largest Portion of Auto Sector Jobs*



Source: https://autoalliance.org/economy/
Alliance of Automobile Manufacturers' *Cars Move America: State of the Auto Industry*
* Out of the total 7.5 million auto sector jobs - includes direct and indirect jobs

Suppliers Employ Workers in All 50 States

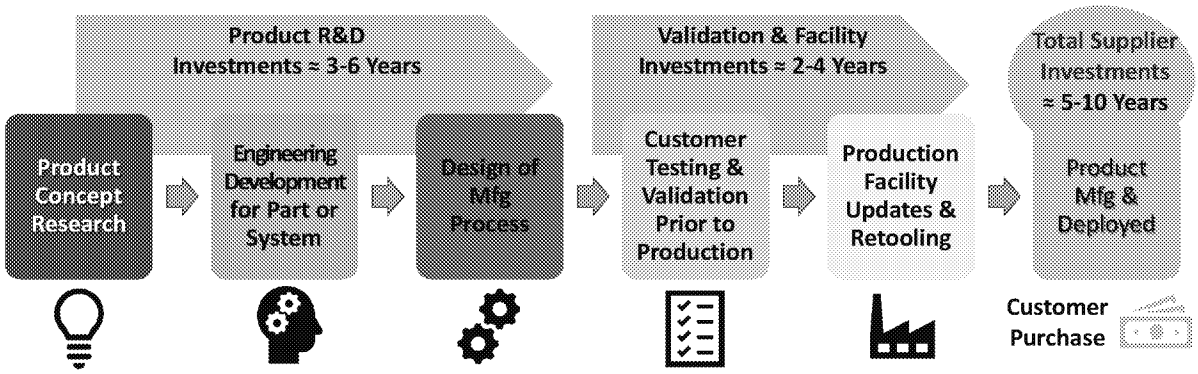




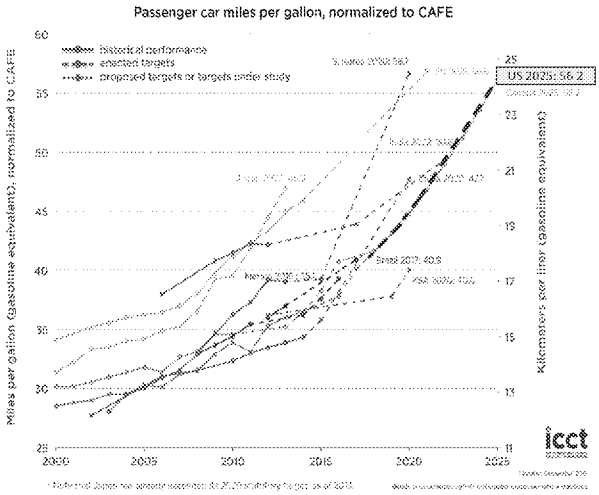
"Driving the Future: The Employment and Economic Impact of the Vehicle Supplier Industry in the U.S." MEMA and the Boston Consulting Group, January 2017

5

Need for Certainty:
Significant Risk for Supplier Investments



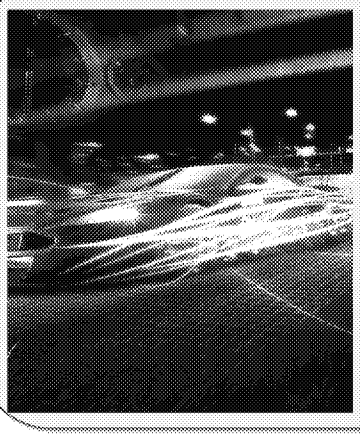
Long-Term Targets Drive Technology Innovation



Significant Changes to the Standards Would:

- Put U.S. companies at a competitive disadvantage
- Increase the likelihood that work and investments on these emissions-reducing technologies would shift to other markets
- Tilt the balance away from American innovation, and result in a loss of U.S. jobs

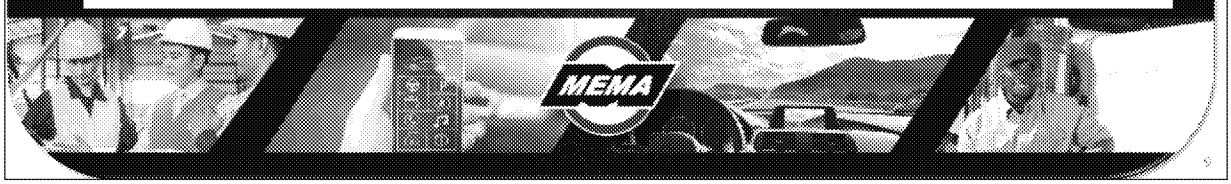
Suppliers Support Further Off-Cycle Technology Credit Opportunities and Flexibilities



- Off-Cycle Technologies Offer Real-World Emissions-Reductions
- Off-Cycle Credits Incentivize Vehicle Manufacturer Adoption of Technologies
- Preserves Long-term Supplier Technology Investments

MEMA Priorities for Midterm Evaluation

- Forward progress on the standards
- Regulatory certainty through 2025 and post-2025
- One National Program stays intact
- Preserve American leadership for technology innovation
- Further opportunities for off-cycle technologies to be recognized



Message

From: Bethany Davis [bethany@boydengrayassociates.com]
Sent: 9/28/2017 8:04:23 PM
To: Ford, Hayley [ford.hayley@epa.gov]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Dominguez.Alex@epa.gov; Adam Gustafson [gustafson@boydengrayassociates.com]
Subject: Meeting with Administrator Pruitt

Dear Haley,

I'm reaching out on behalf of Ambassador C. Boyden Gray to set up a meeting with Administrator Pruitt regarding the Midterm Evaluation.

We have lots of flexibility next week, including 2:30-4:30pm on Oct. 3, 4 or 5.

Thank you,

Bethany Davis Horyn | Special Assistant
BOYDEN GRAY & ASSOCIATES
801 17th ST NW, Suite 350
Washington, DC 20006
Tel: 202-706-5491| Fax: 202-955-0621

Message

From: ROBERT.WYMAN@lw.com [ROBERT.WYMAN@lw.com]
Sent: 9/19/2017 3:50:23 PM
To: Dominguez, Alexander [dominguez.alexander@epa.gov]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: Request for Introductory Meeting - Wednesday, September 27, 4:30 pm

Alex -- thank you sincerely. I will send a list of attendees by Monday.

So greatly appreciated.

Bob

From: Dominguez, Alexander [mailto:dominguez.alexander@epa.gov]
Sent: Tuesday, September 19, 2017 5:12 AM
To: Wyman, Robert (LA)
Cc: Gunasekara, Mandy
Subject: RE: Request for Introductory Meeting - Wednesday, September 27, 4:30 pm

Morning Bob,

Confirmed for Wednesday, September 27, at 4:30PM EST.

Location: 1200 Pennsylvania Avenue, NW

Directions: Please use the William Jefferson Clinton North Entrance located on your right as you exit the Federal Triangle Metro Station.
https://www.epa.gov/sites/production/files/2013-08/federaltrianglemap5.jpg

EPA Contact: For an escort from Security to the meeting call 202-578-5985 or 202-564-3164

Please send me a list of attendees by Monday, September 25, so I can give that to security.

Anything else just let me know.

Best,

Alex Dominguez
Policy Analyst to the Senior Advisors to
the Administrator for Air and Water
U.S. Environmental Protection Agency

From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Monday, September 18, 2017 2:05 PM
To: Dominguez, Alexander <dominguez.alexander@epa.gov>
Cc: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: Request for Introductory Meeting - Wednesday, September 27, 4:30 pm

Good morning, Alex. I am writing to request an introductory meeting with Mandy Gunasekara on the subject of the midterm evaluation and the national greenhouse gas emissions standards for motor vehicles. I make this request on behalf of the ***National Coalition for Advanced Transportation (NCAT)***.

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If possible, we would like to meet with Ms. Gunasekara on Wednesday, September 27, at 4:30 pm. We will be meeting earlier in the afternoon at 3:00 pm with Chris Grundler of OTAQ.

Of course, if 4:30 pm is not a good time, we will do our best to accommodate a different time or date.

Sincere thanks.

Bob

Robert A. Wyman, Jr.
LATHAM & WATKINS LLP
Email: robert.wyman@lw.com

355 South Grand Avenue
Los Angeles, CA 90071-1560
Direct: +1.213.891.8346

555 Eleventh Street, NW
Washington, DC 20004-1304
Direct: +1.202.654.7119

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Message

From: Dominguez, Alexander [dominguez.alexander@epa.gov]
Sent: 9/19/2017 12:11:54 PM
To: Robert.Wyman@LW.com
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: Request for Introductory Meeting - Wednesday, September 27, 4:30 pm

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Policy Analyst to the Senior Advisors to
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From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Monday, September 18, 2017 2:05 PM
To: Dominguez, Alexander <dominguez.alexander@epa.gov>
Cc: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: Request for Introductory Meeting - Wednesday, September 27, 4:30 pm

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Bob

Robert A. Wyman, Jr.
LATHAM & WATKINS LLP
Email: robert.wyman@lw.com

355 South Grand Avenue
Los Angeles, CA 90071-1560
Direct: +1.213.891.8346

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Message

From: Laurie Holmes [lholmes@mema.org]
Sent: 10/10/2017 8:17:20 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Dominguez, Alexander [dominguez.alexander@epa.gov]
Subject: Request for Meeting - Auto Suppliers on Midterm Evaluation of GHG Vehicle Emissions

Mandy:

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As vehicle suppliers we have a strong interest in the midterm evaluation and the vehicle emissions standards. Our position is also not identical to the vehicle manufactures on this issue.
It would be helpful if we could discuss our position and concerns with your office as this process is getting started.

Best,
Laurie

Laurie Holmes
Senior Director, Environmental Policy
Motor & Equipment Manufacturers Association
1030 15th Street NW, Suite 500 East
Washington, DC 20005
Direct: 202-312-9247
Mobile: 202-422-6182

Message

From: ROBERT.WYMAN@lw.com [ROBERT.WYMAN@lw.com]
Sent: 9/18/2017 6:04:43 PM
To: Dominguez, Alexander [dominguez.alexander@epa.gov]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Request for Introductory Meeting - Wednesday, September 27, 4:30 pm

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Latham & Watkins LLP

Message

From: Lee Janger [lee@armitagellc.com]
Sent: 6/7/2017 4:36:32 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: Meeting Request - June 14

Hi Mandy,

I thought I'd try again to reach and see if you and/or your policy team are able to meet next week on Wednesday, June 14th with our auto supplier group.

Again, I apologize for all the emails and calls.

Best regards,
-Lee

From: Lee Janger
Sent: Thursday, June 01, 2017 11:51 AM
To: 'Gunasekara.Mandy@epa.gov' <Gunasekara.Mandy@epa.gov>
Subject: RE: Meeting Request

Hi Mandy,

Sorry we couldn't meet with you, Samantha or Brittany last week. Alex did admirably in your absence as he was familiar with our group from our visits to Mr. Renacci's office last year.

Not to be a pest, but I am hoping we can reschedule and meet with you and your policy team on either June 13 or 14.

Please let me know if your schedule has any openings either of those days.

Best regards,
-Lee

Lee J. Janger
Director, Legislative and Regulatory Affairs
Alliance for Vehicle Efficiency
202.607.0723
Lee@ArmitageLLC.com

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From: Gunasekara, Mandy [mailto:Gunasekara.Mandy@epa.gov]
Sent: Friday, April 28, 2017 1:18 PM

To: Lee Janger <lee@armitagellc.com>; Washington, Valerie <Washington.Valerie@epa.gov>
Subject: RE: Meeting Request

Hi Lee,

Happy to set something up. Valerie, can you set a meeting up and coordinate with either Robin or Carolyn to ensure it works with Samantha and Brittany's schedule? It would be good for us all to meet with Lee and his group.

Thanks,
Mandy

From: Lee Janger [mailto:lee@armitagellc.com]
Sent: Friday, April 28, 2017 12:44 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: Meeting Request

Hi Mandy,

I am hoping to schedule a meeting with you for **the afternoon of May 22nd or anytime on May 23rd or 24th.**

For the last 8 years, I have represented an auto supplier group called the U.S. Coalition for Advanced Diesel Cars. After 8 years, we re-launched last month as the Alliance for Vehicle Efficiency. Our members include most of the largest auto suppliers in the U.S. (Honeywell, BorgWarner, Bosch, and others) We moved away from the previous name to broaden our focus on all the technologies are members are developing for light duty vehicles. Our message, however, is ostensibly the same. We support technology neutral policies that accelerate the adoption of the most cost effective advanced technology applications across the light duty segment.

Over the years, we have met with Senator Inhofe and he was a strong supporter of several of our issues. I think you may have been present for one of our meetings with him or with committee staff several years ago.

In addition to the re-launch of our group, our main issues for discussion with EPA would include the Midterm Evaluation and the OEMs recent petition. We would also like to know what type of information the auto supplier community might be able to provide EPA to assist with the rulemaking.

Please let me know if you have any questions about this request and if you have any time to meet with us later next month.

Best regards,
-Lee

Lee J. Janger
Director, Legislative and Regulatory Affairs
Alliance for Vehicle Efficiency
202.607.0723
Lee@ArmitageLLC.com

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Message

From: Lee Janger [lee@armitagellc.com]
Sent: 6/1/2017 3:52:03 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: Meeting Request

Hi Mandy,

Sorry we couldn't meet with you, Samantha or Brittany last week. Alex did admirably in your absence as he was familiar with our group from our visits to Mr. Renacci's office last year.

Not to be a pest, but I am hoping we can reschedule and meet with you and your policy team on either June 13 or 14.

Please let me know if your schedule has any openings either of those days.

Best regards,
-Lee

Lee J. Janger
Director, Legislative and Regulatory Affairs
Alliance for Vehicle Efficiency
202.607.0723
Lee@ArmitageLLC.com

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From: Gunasekara, Mandy [mailto:Gunasekara.Mandy@epa.gov]
Sent: Friday, April 28, 2017 1:18 PM
To: Lee Janger <lee@armitagellc.com>; Washington, Valerie <Washington.Valerie@epa.gov>
Subject: RE: Meeting Request

Hi Lee,

Happy to set something up. Valerie, can you set a meeting up and coordinate with either Robin or Carolyn to ensure it works with Samantha and Brittany's schedule? It would be good for us all to meet with Lee and his group.

Thanks,
Mandy

From: Lee Janger [mailto:lee@armitagellc.com]
Sent: Friday, April 28, 2017 12:44 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: Meeting Request

Hi Mandy,

I am hoping to schedule a meeting with you for **the afternoon of May 22nd or anytime on May 23rd or 24th.**

For the last 8 years, I have represented an auto supplier group called the U.S. Coalition for Advanced Diesel Cars. After 8 years, we re-launched last month as the Alliance for Vehicle Efficiency. Our members include most of the largest auto suppliers in the U.S. (Honeywell, BorgWarner, Bosch, and others) We moved away from the previous name to broaden our focus on all the technologies are members are developing for light duty vehicles. Our message, however, is ostensibly the same. We support technology neutral policies that accelerate the adoption of the most cost effective advanced technology applications across the light duty segment.

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In addition to the re-launch of our group, our main issues for discussion with EPA would include the Midterm Evaluation and the OEMs recent petition. We would also like to know what type of information the auto supplier community might be able to provide EPA to assist with the rulemaking.

Please let me know if you have any questions about this request and if you have any time to meet with us later next month.

Best regards,
-Lee

Lee J. Janger
Director, Legislative and Regulatory Affairs
Alliance for Vehicle Efficiency
202.607.0723
Lee@ArmitageLLC.com

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Message

From: Forman Matthew (FCA) [matthew.forman@fcagroup.com]
Sent: 8/29/2017 4:38:00 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: EPA hearing on Midterm Evaluation

Hi Mandy. In the past, a representative from FCA has testified in additon to our trade association. This time around we are planning on relying on our trade association to speak on our behalf unless you think it would be beneficial to the process to hear testimony from a specific company rep. Please let me know what you think.
Thanks,
Matt

Message

From: Lee Janger [lee@armitagellc.com]
Sent: 5/22/2017 12:41:28 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
CC: Washington, Valerie [Washington.Valerie@epa.gov]
Subject: Meeting with Alliance for Vehicle Efficiency

Mandy,

Looking forward to our meeting tomorrow at 11 a.m. Below is a list of attendees. Please let me know if there are any questions o

Lee Janger, Alliance for Vehicle Efficiency
Jeff Breneman, Alliance for Vehicle Efficiency
Stacey Bernards, Honeywell
David Cetola, Johnson Matthey
Greg Garr, Umicore
David Lancaster, BorgWarner

Best regards,
-Lee

Lee J. Janger
Director, Legislative and Regulatory Affairs
Alliance for Vehicle Efficiency
202.607.0723
Lee@ArmitageLLC.com

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From: Lee Janger
Sent: Friday, May 05, 2017 4:16 PM
To: 'Washington, Valerie' <Washington.Valerie@epa.gov>
Subject: RE: Meeting Request

Hi Ms. Washington,

Thanks again for taking the time to speak with me just now. To confirm, my group, The Alliance for Vehicle Efficiency is meeting with Ms. Gunasekara, Ms. Samantha Dravis, and Ms. Brittney Bolden on May 23rd at 11:00 a.m. at the North Building at 1200 Pennsylvania Ave.

We will likely be a group of 5-7 people.

Thank you,

-Lee

Lee J. Janger
Director, Legislative and Regulatory Affairs
Alliance for Vehicle Efficiency
202.607.0723
Lee@ArmitageLLC.com

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From: Lee Janger
Sent: Wednesday, May 03, 2017 12:52 PM
To: 'Washington, Valerie' <Washington.Valerie@epa.gov>
Subject: RE: Meeting Request

Hi Valerie,

My apologies but I did not receive it. I just checked my spam folder and it isn't there either. In any event, May 23rd at 11 a.m. works great for us.

Please let me know if there is any specific information you will need prior to the meeting. Of course, I will send a complete list of attendees beforehand and a brief review of our group and possible topics for discussion.

Thank you again for your help.

-Lee

From: Washington, Valerie [mailto:Washington.Valerie@epa.gov]
Sent: Wednesday, May 03, 2017 12:49 PM
To: Lee Janger <lee@armitagellc.com>
Subject: RE: Meeting Request

Hi Lee,
I send a invite for May 23 @ 11am. I will send it again. Please call me and let me know if you received it. Thanks

---

From: Lee Janger [mailto:lee@armitagellc.com]
Sent: Wednesday, May 03, 2017 12:17 PM
To: Washington, Valerie <Washington.Valerie@epa.gov>
Subject: RE: Meeting Request

Hi Valerie,

I am hoping to follow up with you on Mandy's email from last week. We are looking to meet the afternoon of May 22nd or anytime on May 23rd. If necessary we could also meet the morning of May 24th.

Please let me know what availability Mandy and your team have on those dates, and feel free to contact me with any questions you might have about the meeting or our group.

Thank you for any assistance you can provide getting this scheduled.

Best regards,
-Lee

Lee J. Janger
Director, Legislative and Regulatory Affairs
Alliance for Vehicle Efficiency
202.607.0723
Lee@ArmitageLLC.com

www.VehicleEfficiency.com

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From: Gunasekara, Mandy [mailto:Gunasekara.Mandy@epa.gov]
Sent: Friday, April 28, 2017 1:18 PM
To: Lee Janger <lee@armitagellc.com>; Washington, Valerie <Washington.Valerie@epa.gov>
Subject: RE: Meeting Request

Hi Lee,

Happy to set something up. Valerie, can you set a meeting up and coordinate with either Robin or Carolyn to ensure it works with Samantha and Brittany's schedule? It would be good for us all to meet with Lee and his group.

Thanks,
Mandy

From: Lee Janger [mailto:lee@armitagellc.com]
Sent: Friday, April 28, 2017 12:44 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: Meeting Request

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Over the years, we have met with Senator Inhofe and he was a strong supporter of several of our issues. I think you may have been present for one of our meetings with him or with committee staff several years ago.

In addition to the re-launch of our group, our main issues for discussion with EPA would include the Midterm Evaluation and the OEMs recent petition. We would also like to know what type of information the auto supplier community might be able to provide EPA to assist with the rulemaking.

Please let me know if you have any questions about this request and if you have any time to meet with us later next month.

Best regards,
-Lee

Lee J. Janger
Director, Legislative and Regulatory Affairs
Alliance for Vehicle Efficiency
202.607.0723
Lee@ArmitageLLC.com

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Message

From: Lee Janger [lee@armitagellc.com]
Sent: 4/28/2017 4:43:43 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Meeting Request

Hi Mandy,

I am hoping to schedule a meeting with you for **the afternoon of May 22nd or anytime on May 23rd or 24th.**

For the last 8 years, I have represented an auto supplier group called the U.S. Coalition for Advanced Diesel Cars. After 8 years, we re-launched last month as the Alliance for Vehicle Efficiency. Our members include most of the largest auto suppliers in the U.S. (Honeywell, BorgWarner, Bosch, and others) We moved away from the previous name to broaden our focus on all the technologies are members are developing for light duty vehicles. Our message, however, is ostensibly the same. We support technology neutral policies that accelerate the adoption of the most cost effective advanced technology applications across the light duty segment.

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Please let me know if you have any questions about this request and if you have any time to meet with us later next month.

Best regards,
-Lee

Lee J. Janger
Director, Legislative and Regulatory Affairs
Alliance for Vehicle Efficiency
202.607.0723
Lee@ArmitageLLC.com

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Message

From: Cunningham, Allison [ACunningham@ngvamerica.org]
Sent: 5/4/2018 4:51:06 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: Follow Up-MTE and Feb 16th meeting w/ Bill Wehrum on Natural Gas Vehicles

Mandy,

I wanted to follow up on the below email I sent last week and inquire as to your recommendation regarding our input on MTE?

Thank you!

Allison Cunningham
Director, Federal Government Affairs
NGVAmerica
400 N. Capitol St. NW STE 450, Washington, D.C. 20001
202.824.7363 [o] | 202.578.0141 [m]
acunningham@ngvamerica.org
ngvamerica.org; ngv.com; ngvshow.com

From: Cunningham, Allison
Sent: Thursday, April 26, 2018 4:18 PM
To: gunasekara.mandy@epa.gov
Subject: Follow Up-MTE and Feb 16th meeting w/ Bill Wehrum on Natural Gas Vehicles

Mandy,

I hope this email finds you well. I wanted to follow up on our February 16 meeting with Assistant Administrator Wehrum, which you joined. During that meeting, Jeff Clarke, our Director, Regulatory Affairs, and I discussed NGVAmerica proposals for EPA's regulatory review efforts.

We were delighted to see NGVAmerica comments included in the recent MTE final determination notice. As part of the anticipated rulemaking, I wanted to touch base and ask the best way for us to provide industry input on the proposed rule?

Any information you can provide about the best way to submit industry input, anticipated timelines, and the like would be much appreciated. We are also glad to come in for a follow up meeting with you or one of your colleagues if that is helpful.

Thank You,

Allison Cunningham
Director, Federal Government Affairs
NGVAmerica
400 N. Capitol St. NW STE 450, Washington, D.C. 20001
202.824.7363 [o] | 202.578.0141 [m]
acunningham@ngvamerica.org

ngvamerica.org; ngv.com; ngvshow.com

Message

From: Segal, Scott [scott.segal@bracewell.com]
Sent: 7/28/2017 6:23:16 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: RE: Want to talk about the decision?

SCOTT SEGAL
Partner
scott.segal@policyres.com
T: +1.202.828.5845 | F: +1.800.404.3970

BRACEWELL LLP
2001 M Street NW, Suite 900 | Washington, D.C. | 20036-3310
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Begin forwarded message:

From: James Lucier <james.lucier@capalphadc.com>
Date: July 28, 2017 at 2:11:30 PM EDT
Subject: RFS: Good News For Refiners In Substance of the D.C. Circuit Decision
Reply-To: James Lucier <james.lucier@capalphadc.com>

CAPITAL ALPHA
PARTNERS

RFS: Good News for Refiners in Substance of the D.C. Circuit Decision

July 28, 2017 | **BIOFUELS**

- Headlines we've seen on this morning's landmark court case over the 2014-2016 Renewable Fuel Standard volumes, including ours, while correct, likely overstate the negative impact of the case on refiners.

- Upon our in-depth read of the decision, we have identified a second mitigating factor in the order in addition to the Court's seeming openness to use by EPA of a "severe economic harm" waiver to rewrite the volumes at an identical or substantially similar level.
- The court found that it was reasonable for EPA to base the 2014 and a portion of the 2015 standards on the volumes that were actually observed in those years. These volumes are not up for rewrite. Consequently the worst-case scenario for refiners is 740 million RINs, rather than 2.24 billion RINs.

- Happily, for refiners, we reiterate that it is unlikely in our view that they will face compliance obligations of this magnitude. In short, we see less downside: better chances of something nearer the status quo. For more details, please see the full note.

Download PDF

- James Lucier

james.lucier@capalphadc.com
202-548-0072
Tristan Berne
tristan.berne@capalphadc.com
202-548-0085
Alan McCormick
alan.mccormick@capalphadc.com
202-548-2549

- RELATED RESEARCH

RFS FLASH: DC Circuit Rules EPA Must Redo 2014-2016 Volumes in Win for Ethanol
July 28, 2017
CAFE: DOT Begins Process to Set 2022-2025 Standards
July 27, 2017
Atlantic Coast Pipeline: FERC Issues Favorable EIS; All Eyes on Forest Service
July 21, 2017
Energy Rewind: Positive Signs for Atlantic Coast, DAPL; Illinois ZEC

Case Dismissed
July 21, 2017

ANALYST CERTIFICATION
The following analysts hereby certify (1) that their views about any and all of the subject companies and securities discussed in this report are accurately expressed and (2) that no part of their compensation was, is, or will be directly or indirectly related to the views expressed in this report: James Lucier, Tristan Berne, Alan McCormick.

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600 Pennsylvania Ave SE Suite 220 Washington, DC 20003 United States

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From: Gunasekara, Mandy [mailto:Gunasekara.Mandy@epa.gov]
Sent: Friday, July 28, 2017 1:14 PM
To: Segal, Scott <scott.segal@bracewell.com>
Subject: RE: Want to talk about the decision?

Yes – I'm on a call right now. Will try to reach out before 2

From: Segal, Scott [mailto:scott.segal@bracewell.com]
Sent: Friday, July 28, 2017 1:12 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: Want to talk about the decision?

Sent from my iPhone

SCOTT SEGAL
Partner
scott.segal@policyres.com
T: +1.202.828.5845 | F: +1.800.404.3970

POLICY RESOLUTION GROUP | BRACEWELL LLP
2001 M Street NW, Suite 900 | Washington, D.C. | 20036-3310
policyres.com | profile | download v-card

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Message

From: Cunningham, Allison [ACunningham@ngvamerica.org]
Sent: 4/26/2018 8:17:34 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Follow Up-MTE and Feb 16th meeting w/ Bill Wehrum on Natural Gas Vehicles

Mandy,

I hope this email finds you well. I wanted to follow up on our February 16 meeting with Assistant Administrator Wehrum, which you joined. During that meeting, Jeff Clarke, our Director, Regulatory Affairs, and I discussed NGVAmerica proposals for EPA's regulatory review efforts.

We were delighted to see NGVAmerica comments included in the recent MTE final determination notice. As part of the anticipated rulemaking, I wanted to touch base and ask the best way for us to provide industry input on the proposed rule?

Any information you can provide about the best way to submit industry input, anticipated timelines, and the like would be much appreciated. We are also glad to come in for a follow up meeting with you or one of your colleagues if that is helpful.

Thank You,

Allison Cunningham
Director, Federal Government Affairs
NGVAmerica
400 N. Capitol St. NW STE 450, Washington, D.C. 20001
202.824.7363 [o] | 202.578.0141 [m]
acunningham@ngvamerica.org
ngvamerica.org; ngv.com; ngvshow.com

Message

From: Julia Rege [JRege@globalautomakers.org]
Sent: 8/16/2017 1:19:30 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]
Subject: Check In

Mandy,

Hope you are doing well. It's been a while since we've checked in on midterm review. I wanted to follow up with you on a few things but don't seem to have a phone number for you. My contact info is below.

Looking forward to talking with you.

Best, Julia

Julia Rege
Director, Environment & Energy
Association of Global Automakers, Inc. (Global Automakers)
1050 K Street, NW, Suite 650
Washington, DC 20001
202.650.5559 (direct)
202.650.5555 (main)
202.436.2266 (mobile)
jrege@globalautomakers.org
GlobalAutomakers

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Message

From: Gunasekara, Mandy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=53D1A3CAA8BB4EBAB8A2D28CA59B6F45-GUNASEKARA,]
Sent: 4/2/2018 12:01:01 AM
To: Aaron.L.Szabo Ex. 6 Personal Privacy (PP)
Subject: Fwd: Updated draft Reconsideration notice for review
Attachments: Draft FD for AA Wehrum review, April 1 at 7pm, Clean.docx; ATT00001.htm; Draft FD for AA Wehrum review, April 1 at 7pm RLSO.DOCX; ATT00002.htm

Here is an advance copy. I'm about to go through this on the plane. We will send the official version over tomorrow morning.

Sent from my iPhone

Begin forwarded message:

> **From:** "Charmley, William" <charmley.william@epa.gov>
> **Date:** April 1, 2018 at 5:06:26 PM MDT
> **To:** "Wehrum, Bill" <Wehrum.Bill@epa.gov>, "Gunasekara, Mandy" <Gunasekara.Mandy@epa.gov>, "Grundler, Christopher" <grundler.christopher@epa.gov>
> **Cc:** "Simon, Karl" <Simon.Karl@epa.gov>, "Sutton, Tia" <sutton.tia@epa.gov>, "Lieske, Christopher" <lieske.christopher@epa.gov>, "Olechiw, Michael" <olechiw.michael@epa.gov>, "Alson, Jeff" <alson.jeff@epa.gov>, "Kataoka, Mark" <Kataoka.Mark@epa.gov>, "Orlin, David" <Orlin.David@epa.gov>, "Wysor, Tad" <wysor.tad@epa.gov>, "Hengst, Benjamin" <Hengst.Benjamin@epa.gov>, "Burch, Julia" <Burch.Julia@epa.gov>, "Moran, Robin" <moran.robin@epa.gov>
> **Subject: Updated draft Reconsideration notice for review**
>
> Dear Bill, Mandy and Chris –
>
> Attached is the revised draft Reconsideration Notice for the midterm evaluation. Chris is also going to review this evening, as he has not reviewed all of our updates from this weekend.
>
> The RLSO is a redline/strikeout compared to the version we received Friday from OMB. The comment field "author" is from the interagency review. All other comments are from EPA, and all of the redline/strikeout is from EPA.
>
> Also attached is a clean version.
>
> Per our discussion with Bill on Saturday morning, our goal is to send a revised document to OMB for final interagency review and clearance first thing Monday morning.
>
> Thanks
> Bill Charmley

Message

From: Gunasekara, Mandy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=53D1A3CAA8BB4EBAB8A2D28CA59B6F45-GUNASEKARA,]
Sent: 3/23/2018 4:13:29 PM
To: Wilcox, Jahan [wilcox.jahan@epa.gov]
CC: Jennifer A. Dlouhy [jdlouhy1@bloomberg.net]; rbeene@bloomberg.net; Press [Press@epa.gov]; Bowman, Liz [Bowman.Liz@epa.gov]
Subject: Re: Comment requested re auto standards

This is good

Sent from my iPhone

On Mar 23, 2018, at 11:52 AM, Wilcox, Jahan <wilcox.jahan@epa.gov> wrote:

> **"The draft determination has been sent to OMB and is undergoing interagency review. A final determination will be signed by April 1, 2018, consistent with the original timeline,"** Liz Bowman, EPA spokesperson

---

From: Jennifer A. Dlouhy (BLOOMBERG/ NEWSROOM:) [mailto:jdlouhy1@bloomberg.net]
Sent: Friday, March 23, 2018 11:21 AM
To: Press <Press@epa.gov>
Cc: rbeene@bloomberg.net
Subject: Comment requested re auto standards

Good morning, EPA!

We are writing a story citing people familiar that say EPA has completed a draft final determination finding that the light vehicle greenhouse gas standards for 2022-2025 need to be revised.

The people say that Bill Wehrum plans to visit California next week to discuss the draft conclusion of the midterm evaluation with officials from the California Air Resources Board.

Can we get a comment on this?

Jennifer A. Dlouhy
jdlouhy1@bloomberg.net / jendlouhyenergy@gmail.com
reporterjen@protonmail.com
Desk: 202.807.2159
Cell/Text/Signal: 202.905.3257
Twitter: @jendlouhyhc
Stories: http://bloom.bg/23Crpvk

Message

From: Gunasekara, Mandy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=53D1A3CAA8BB4EBAB8A2D28CA59B6F45-GUNASEKARA,]
Sent: 1/18/2018 10:22:30 PM
To: Spector, Mike [mike.spector@wsj.com]
Subject: Re: Are we supposed to chat?

Perfect!

Sent from my iPhone

On Jan 18, 2018, at 5:17 PM, Spector, Mike <mike.spector@wsj.com> wrote:

> Let's aim for 5 pm tomorrow then as I have the same issue with kiddos. =)
>
> On Thu, Jan 18, 2018 at 5:15 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:
> 5 pm
>
> Sent from my iPhone
>
> On Jan 18, 2018, at 5:10 PM, Spector, Mike <mike.spector@wsj.com> wrote:
>
> > Sure try my cell tonight...or on tomorrow you mean 5 am or 5 pm?
> >
> > On Thu, Jan 18, 2018 at 5:05 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:
> > Hey Mike- does later tonight work? I'm booked until I pick up kids and it's easier to chat once they are in bed- so 8:30 or 9? If that's too late, then 5 tomorrow could work.
> >
> > Sent from my iPhone
> >
> > On Jan 18, 2018, at 10:46 AM, Spector, Mike <mike.spector@wsj.com> wrote:
> >
> > > Hi Mandy. Left you a message ... hope you had a great holiday and new year. Wanted to check in on midterm review, on background, when you have a second. 212-416-2572 or 313-320-7388.
> > >
> > > Best,
> > > Mike
> > >
> > > On Wed, Sep 6, 2017 at 4:31 PM, Gunasekara, Mandy <Gunasekara.Mandy@epa.gov> wrote:
> > >
> > > > Hey Mike – per our conversation, I'm connecting you with Mike Catanzaro who will also be able to provide some helpful background from the WH perspective.

From: Spector, Mike [mailto:mike.spector@wsj.com]
Sent: Wednesday, September 6, 2017 3:37 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: Are we supposed to chat?

Hi Mandy. Assuming I have the right person, my colleague, John Stoll, said you called earlier and were planning to give me a buzz at 3:30?

--

Mike Spector
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(313) 320-7388 (cell)
mike.spector@wsj.com

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Message

From: Gunasekara, Mandy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=53D1A3CAA8BB4EBAB8A2D28CA59B6F45-GUNASEKARA,]
Sent: 1/18/2018 10:15:36 PM
To: Spector, Mike [mike.spector@wsj.com]
Subject: Re: Are we supposed to chat?

5 pm

Sent from my iPhone

On Jan 18, 2018, at 5:10 PM, Spector, Mike <mike.spector@wsj.com> wrote:

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> > > > **To:** Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
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Message

From: Gunasekara, Mandy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=53D1A3CAA8BB4EBAB8A2D28CA59B6F45-GUNASEKARA,]
Sent: 1/18/2018 10:05:00 PM
To: Spector, Mike [mike.spector@wsj.com]
Subject: Re: Are we supposed to chat?

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> > **Subject:** Are we supposed to chat?
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> > Mike Spector
> > The Wall Street Journal
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> > New York, NY 10036
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Message

From: Gunasekara, Mandy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=53D1A3CAA8BB4EBAB8A2D28CA59B6F45-GUNASEKARA,]
Sent: 1/2/2018 10:44:30 PM
To: David Schwietert [DSchwietert@autoalliance.org]
CC: Chris Nevers [CNevers@autoalliance.org]; Harlow, David [harlow.david@epa.gov]
Subject: Re: Auto Alliance Follow up - E10 test fuel info

David- thank you for the information. David H and I will discuss and followup.

Sent from my iPhone

On Jan 2, 2018, at 5:08 PM, David Schwietert <DSchwietert@autoalliance.org> wrote:

Mandy,

Thank you for your time last year to discuss regulatory reform and other Industry concerns.

One item that we raised in our conversation, was the E10 "testing cliff" and the need for EPA to extend the deadline from 2020MY (Model Year) to potentially 2022MY for the continued use of E0 for CAFE/ GHG testing. We understand that EPA career staff are intending to release test data showing a small decrease in CO2 when testing on E10 instead of E0. We believe this data release is premature and should come out either with the MTE NPRM or a proposal on possible test procedure adjustments that would take into account any MTE related stringency changes. Any early release of data will only serve to solidify opposition to holistic solutions that include lower carbon fuels. Keep in mind, we agree on the need to incorporate E10 test fuels but the manner and time of how that is done warrants consideration – recognizing that there's no environmental degradation with maintaining the E0 test fuel.

I would draw your attention to the following summary of the Alliance comments that were submitted last year to the docket explaining our position on how to handle the E10 test fuel transition:

- Only the E10 test requirement deadline is critical to address at this point.
- Anything beyond addressing the 2020MY test deadline should be part of the MTE.
- <!--[if !supportLists]--><!--[endif]-->Test procedure adjustments that affect stringency, for example by increasing or decreasing tailpipe CO2 from what is measured, should be part of an overall stringency discussion.
- <!--[if !supportLists]--><!--[endif]-->The Alliance would prefer to see an action that delays implementation of E10 for GHG and CAFE testing or similarly allows for continued use of the fuel on which the GHG and CAFE rules were developed back in 2012.

At the bottom of this email is an excerpt from the Alliance comment on the recent EPA MTE request for comments, page 78-79, titled "Re: Request for Comment on Reconsideration of the Final Determination of the Mid Term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022–2025 Light-Duty Vehicles; Request for Comment on Model Year 2021 Greenhouse Gas Emissions Standards (EPA–HQ–OAR–2015–0827; FRL–9966–62–OAR)"

Important questions that need to be addressed if CO2 and CAFE are adjusted beyond that which is already required by statute (CAFE) include:

- <!--[if !supportLists]--><!--[endif]-->How does adjusting what is measured at the tailpipe with E10 test fuel affect different vehicles/ technologies?
- <!--[if !supportLists]--><!--[endif]-->How would differences between manufacturers or technologies be addressed?
- <!--[if !supportLists]--><!--[endif]-->How would adjusting what is measured affect future biofuels? (if manufacturers constantly correct "back" to E0)
- <!--[if !supportLists]--><!--[endif]-->Under this scenario, will there ever be a benefit for biofuels?
- <!--[if !supportLists]--><!--[endif]-->Under this scenario, will there ever be an incentive for manufacturers to design vehicles for new "low carbon" fuels?
- <!--[if !supportLists]--><!--[endif]-->Is the EPA going to start adjusting what is measured for criteria pollutants as well?
- <!--[if !supportLists]--><!--[endif]-->How does this change the E85 precedent of reporting what you measure?
- <!--[if !supportLists]--><!--[endif]-->Why isn't the renewable E10 carbon subtracted from the tailpipe numbers for GHG?
- <!--[if !supportLists]--><!--[endif]-->Will any "adjustment factor" back to E0 require constant monitoring and updating as new vehicles and technologies come out?
- <!--[if !supportLists]--><!--[endif]-->Will this drive an even greater divide between fuel economy label values and test lab values?
- <!--[if !supportLists]--><!--[endif]-->Could the E10 deadline be fixed in the planned EV multiplier and off-cycle NPRM fix? (again, with no data or proposal other than to delay the deadline)

Again, we believe there's utility in EPA incorporating the use of E10 test fuel in the pending Mid Term Evaluation between EPA and U.S. DOT (or subsequent EPA rulemaking). There may even be an opportunity to fix this issue by inserting a new E10 "deadline" in the currently planned NPRM to fix other EPA issues with off cycle and EV multipliers.

Please let me know if you have any questions.

Dave

Excerpt from Alliance Comments:

6.2. Regulatory Changes Needed to Implement Tier 3 E10 Test Fuel
The Alliance most recently addressed the issue of incomplete regulations for implementing the Tier 3 final rule change to test fuels (the "MY 2020 Cliff") in its May 15, 2017 comments to EPA on reducing regulatory burdens. In 2013, EPA finalized the Tier 3 light-duty vehicle emissions final rule regulations, which require the use of 10% ethanol ("E10") test fuel for fuel economy and CAFE testing by MY 2020; however, EPA still has not issued the regulatory changes necessary to enable such testing. This delay has eroded the expected lead time for this changeover, cast doubt on the feasibility of the MY 2020 deadline, and created considerable uncertainty in manufacturers' product development and compliance planning processes.
Industry, in written comments to EPA, has proposed several ways to address the incomplete regulations, ranging from the issuance of a test procedure adjustment concurrent with the Tier 3 final rule to, more recently, the issuance of a standalone, limited-scope rulemaking to postpone the MY 2020 deadline for the test fuel changeover. Given the impending MY 2020 deadline, industry has also urged EPA to simply consider releasing a letter that would have the effect of

assuring no adverse action against industry in the absence of updated testing regulations. In discussions regarding the test fuel transition, EPA staff indicated that the assurance letter approach was not considered a viable option, but it was unclear whether this assessment was based on well-defined EPA policy. If EPA concludes that it is not able to issue such a letter, EPA should now issue a limited-scope direct final rule postponing the unworkable deadline now facing EPA and the industry. The direct final rule should contain only the regulatory changes needed to remove the MY 2020 E10 fuel economy and GHG testing requirement, and should not attempt to address test procedure adjustments related to the new fuel. Such adjustments are more properly addressed in actions associated with the MTE.

David Schwietert
Executive Vice President, Federal Government Relations & Public Policy
P: 202-326-5521 | dschwietert@autoalliance.org
<image001.png>

<image002.png> ALLIANCE OF AUTOMOBILE MANUFACTURERS
803 7th Street, NW
Suite 300
Washington, DC 20001
Main Phone: 202-326-5500
Main Fax: 202-326-5567

https://autoalliance.org/

Curious to know how the Auto sector impacts your state or district -- Click here. To get a better understanding of how America's automobile industry is one of the most powerful engines driving the U.S. economy, click here.

Message

From: Gunasekara, Mandy [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=53D1A3CAA8BB4EBAB8A2D28CA59B6F45-GUNASEKARA,]
Sent: 4/28/2017 5:17:34 PM
To: Lee Janger [lee@armitagellc.com]; Washington, Valerie [Washington.Valerie@epa.gov]
Subject: RE: Meeting Request

Hi Lee,

Happy to set something up. Valerie, can you set a meeting up and coordinate with either Robin or Carolyn to ensure it works with Samantha and Brittany's schedule? It would be good for us all to meet with Lee and his group.

Thanks,
Mandy

From: Lee Janger [mailto:lee@armitagellc.com]
Sent: Friday, April 28, 2017 12:44 PM
To: Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>
Subject: Meeting Request

Hi Mandy,

I am hoping to schedule a meeting with you for **the afternoon of May 22nd or anytime on May 23rd or 24th.**

For the last 8 years, I have represented an auto supplier group called the U.S. Coalition for Advanced Diesel Cars. After 8 years, we re-launched last month as the Alliance for Vehicle Efficiency. Our members include most of the largest auto suppliers in the U.S. (Honeywell, BorgWarner, Bosch, and others) We moved away from the previous name to broaden our focus on all the technologies are members are developing for light duty vehicles. Our message, however, is ostensibly the same. We support technology neutral policies that accelerate the adoption of the most cost effective advanced technology applications across the light duty segment.

Over the years, we have met with Senator Inhofe and he was a strong supporter of several of our issues. I think you may have been present for one of our meetings with him or with committee staff several years ago.

In addition to the re-launch of our group, our main issues for discussion with EPA would include the Midterm Evaluation and the OEMs recent petition. We would also like to know what type of information the auto supplier community might be able to provide EPA to assist with the rulemaking.

Please let me know if you have any questions about this request and if you have any time to meet with us later next month.

Best regards,
-Lee

Lee J. Janger
Director, Legislative and Regulatory Affairs
Alliance for Vehicle Efficiency
202.607.0723
Lee@ArmitageLLC.com

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Message

From: David Schwietert [DSchwietert@autoalliance.org]
Sent: 4/3/2018 1:39:21 PM
To: Harlow, David [harlow.david@epa.gov]
Subject: RE: RealClearPolitics commentary by Bainwol

Thanks, Mitch felt it was important as some reporters and individuals who don't follow the issue have a lack of understanding about the journey with fuel economy standards.

We appreciated the action by the Administrator yesterday and know that you and Bill contributed to making that possible in terms of tone/approach.

It's unfortunate that some are reacting in the manner they are but we can't lose sight of the end goal with is about creating viable (increased) standards – both for CAFÉ and GHG that don't hurt consumers or the industry as we strive to produce more fuel efficient vehicles

See you later this morning if you plan to attend the 10:30 press announcement

Dave

From: Harlow, David <harlow.david@epa.gov>
Sent: Tuesday, April 03, 2018 9:35 AM
To: David Schwietert <DSchwietert@autoalliance.org>
Subject: RE: RealClearPolitics commentary by Bainwol

David,

Just speaking for myself, I thought this was very nicely done. My compliments to those there who were responsible for putting it together.

David S. Harlow
Senior Counsel
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
WJC-N Room 5409K
1200 Pennsylvania Avenue NW
Washington, DC 20460
202-564-1233
Harlow.David@epa.gov

From: David Schwietert [mailto:DSchwietert@autoalliance.org]
Sent: Tuesday, April 3, 2018 9:08 AM
To: Letendre, Daisy <letendre.daisy@epa.gov>; Jackson, Ryan <jackson.ryan@epa.gov>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>; Bolen, Brittany <bolen.brittany@epa.gov>; Harlow, David <harlow.david@epa.gov>
Subject: RealClearPolitics commentary by Bainwol

FYI

From: Gloria Bergquist
Sent: Tuesday, April 03, 2018 9:05 AM
To: bowman.liz@epa.gov
Cc: Amy Dewey <dewey.amy@epa.gov>; David Schwietert <DSchwietert@autoalliance.org>
Subject: RealClearPolitics commentary by Bainwol

Liz, here is Mitch's op ed that is online now. Gloria

https://www.realclearpolitics.com/articles/2018/04/03/revisiting_of_fuel_standards_is_not_a_rollback_136688.html

Revisiting of Fuel Standards Is Not a Rollback

COMMENTARY

By Mitch Bainwol
April 03, 2018

Washington is a town where truth can be elusive. Ideological agendas and herd reporting often distort issues. When it comes to auto policy, especially in today's highly charged political environment, sensationalism routinely warps reality. Here's an example:

Contrary to the breathless coverage of the Trump administration's action to revisit fuel economy and greenhouse gas emission standards, this decision actually fulfills key promises made by the prior administration. Early in Barack Obama's first term in office, automakers agreed with the president to establish long-term fuel economy targets stretching out to 2025. This bold plan, requiring massive investment by automakers to achieve a social goal we embraced -- addressing climate change -- came with two prudent obligations by policymakers.

First, President Obama and his team committed to undertake a midterm review halfway through the timeframe (2018) to check government predictions against reality and use that information to set standards for 2022-2025. The midterm look-back recognized the challenge of forecasting market and technology factors long into the future, as well as the importance of using evidence-based analysis because the economic stakes were so significant.

Second, policymakers made a commitment to harmonize three regulatory programs that effectively serve the same purpose – managing fuel efficiency/carbon. National Highway Traffic Safety Administration, EPA and California's Air Resources Board all regulate emissions, but in different ways and with different timelines. Redundant government programs drive compliance costs up and that ultimately comes out of the wallets of our customers. The Obama administration stated in writing: "Continuing the National Program ensures that auto manufacturers can build a single fleet of U.S. vehicles that satisfy requirements of both federal programs as well as California's program."

Both of these commitments made sense. The agreement was sound. The goals were shared. And the plan was launched. But something funny happened on the way to the forum.

After the 2016 election, EPA chose to short-circuit the midterm analysis and advance a finding nearly 18 months before it was due. Politics took hold; marketplace realities were ignored. The federal program itself was split, with EPA jumping ahead of NHTSA. The original estimated targets were then justified and rushed through, irrespective of contradictory but salient market developments and irrespective of NHTSA's role in the process. Both commitments – the midterm and One National Program – were abrogated.

The market reality is clear. No factor is more relevant than gas prices, which remain significantly lower than projected. In reaction, consumers are buying more SUVs and trucks, bigger engines and fewer alternative powertrains than regulators expected. When the EPA issued the premature determination early last year, it trumpeted the statistic that automakers were over-complying. Weeks later, government reports indicated that statistic was no longer operative, and, for the first time, automakers missed the emissions targets despite achieving record fuel economy. Since then, compliance has slipped even further.

Remember, the government evaluates automakers on fuel economy standards by what consumers buy – not what automakers put in dealer showrooms. In short, the buying pattern of the American public has demonstrated that a rigid adherence to the standards -- as originally contemplated nearly a decade ago -- is inconsistent with market realities.

Moreover, two or three different regulatory rule sets make no sense. As such, we enthusiastically embrace the idea of One National Program. We did so when we signed up in 2011. We did so in the days immediately after the 2016 election and we do so now. Nothing has changed. Writing to the Trump transition team in November of 2016, we asked that "the White House lead efforts with EPA, NHTSA, CARB and the automakers on finding a pathway forward regarding the standards for 2022 MY and beyond."

Here we are, in April of 2018, the precise point at which the previous administration suggested a judgment be reached about whether to adjust the standards. The new administration has spent a year conducting research, looking at the unfolding data – and has reached the determination that adjustments are warranted.

"Adjustments" are not rollbacks. We favor standards that increase year over year. The industry is committed to ongoing progress in a journey that has no end date. After all, we have invested substantially in energy-efficient technologies that we would like to see consumers embrace. We expect that fuel economy will keep rising. The only issue is at what speed. We do not buy the view that the 2012 projections were perfect and that conditions are unchanged. On the contrary, the projections were materially imperfect and conditions have fundamentally changed.

Even so, no matter how these standards ultimately adjust, the fuel savings through 2025 will likely achieve at least 97 percent of the original estimates. That's because there is profoundly more savings realized on the front end of the curve than on the back end – as moving from 10 to 20 miles per gallon produces 10 times more savings than moving from 40 to 50 miles per gallon.

We asked administration officials to look at the data and base their decision on marketplace realities. They have. We asked them to work with California to try to find a policy outcome that works for both. They are embarked on that mission. Let's give that a try. Too much is at stake to let politics and overheated rhetoric get in the way.

Mitch Bainwol is president and CEO of the Auto Alliance, the leading automotive advocacy group composed of 12 automakers.

GLORIA BERGQUIST
Vice President, Communications and Public Affairs

AUTO ALLIANCE
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Alliance of Automobile Manufacturers
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202-329-1398 Mobile
www.autoalliance.org

Appointment

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 12/13/2017 2:05:22 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Harlow, David [harlow.david@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Sutton, Tia [sutton.tia@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Charmley, William [charmley.william@epa.gov]; Moran, Robin [moran.robin@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Woods, Clinton [woods.clinton@epa.gov]

Subject: Meet with National Coalition for Advanced Transportation (NCAT) (Confirmed)
Attachments: RE: Request for Meeting; Confirmed 12/13 at 4pm: Request for Meeting
Location: WJC-N 5415 + Video with AA + Ex. 6 - Personal Privacy

Start: 12/13/2017 2:30:00 PM
End: 12/13/2017 3:15:00 PM
Show Time As: Tentative

To: Bill Wehrum, Mandy Gunasekara, David Harlow, Alex Dominguez, Ben Hengst, Tia Sutton, Chris Grundler, Bill Charmley, Robin Moran, and Mike Olechiw, Clint Woods
Outside Attendees (in person): TBD

Confirmed 12/13 at 4pm: Request for...

RE: Request for Meeting

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 11/22/2017 1:49:21 PM
To: Robert.Wyman@LW.com
CC: Loving, Shanita [Loving.Shanita@epa.gov]
Subject: Confirmed 12/13 at 4pm: Request for Meeting

Hi Bob,

You are confirmed for a 45 minute in person meeting on Wednesday, December 13, 2017 at 4:00pm with Bill Wehrum.

Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.

Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Acting Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

-----Original Message-----
From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Tuesday, November 21, 2017 4:57 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Request for Meeting

Yes, definitely. Thank you.

From: Atkinson, Emily <Atkinson.Emily@epa.gov>
Sent: Tuesday, November 21, 2017 1:48:14 PM
To: Wyman, Robert (LA)
Cc: Loving, Shanita
Subject: RE: Request for Meeting

Hi Bob,

It looks like Bill Wehrum could be available for a 45 minute in person meeting on Wednesday, December 13, 2017 at 4:00pm.

Please advise if this could work on your end.

Thank you.
Emily

Emily Atkinson
Management Analyst/Office Manager

Immediate Office of the Acting Assistant Administrator Office of Air and Radiation, USEPA Room 5412B, 1200 Pennsylvania Avenue NW Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Friday, November 17, 2017 6:03 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Request for Meeting

Emily - thank you for speaking with me by telephone earlier today. I am writing to request a meeting with Bill Wehrum on the subject of the midterm evaluation and the national greenhouse gas emissions standards for motor vehicles. I make this request on behalf of the National Coalition for Advanced Transportation (NCAT).

NCAT is a coalition of leading companies that support electric vehicle and other advanced transportation technologies and related infrastructure, including through: energy supply, transmission and distribution; vehicle and component design and manufacturing; charging infrastructure, battery and other energy-storage technology design, production and implementation; infrastructure engineering and construction; and the movement of passengers, goods and services; among other activities. Prior to our meeting, I will provide a list of NCAT attendees.

If possible, we would like to meet with Mr. Wehrum and appropriate staff, as he determines, on Wednesday, December 13, at any time. Of course, we recognize that his schedule may not permit meeting on this date, in which case we will do our best to accommodate whatever date he selects.

Sincere thanks.

Bob

Robert A. Wyman, Jr.
LATHAM & WATKINS LLP
Email: robert.wyman@lw.com<mailto:robert.wyman@lw.com>

355 South Grand Avenue
Los Angeles, CA 90071-1560
Direct: +1.213.891.8346

555 Eleventh Street, NW
Washington, DC 20004-1304
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Latham & Watkins LLP

Appointment

From: Lewis, Josh [Lewis.Josh@epa.gov]
Sent: 12/13/2017 12:32:33 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Harlow, David [harlow.david@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Sutton, Tia [sutton.tia@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Charmley, William [charmley.william@epa.gov]; Moran, Robin [moran.robin@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Woods, Clinton [woods.clinton@epa.gov]

Subject: Meet with National Coalition for Advanced Transportation (NCAT) (Confirmed)
Attachments: RE: Request for Meeting; Confirmed 12/13 at 4pm: Request for Meeting
Location: WJC-N 5400 + Video with AA + Ex. 6 - Personal Privacy

Start: 12/13/2017 2:30:00 PM
End: 12/13/2017 3:15:00 PM
Show Time As: Tentative

To: Bill Wehrum, Mandy Gunasekara, David Harlow, Alex Dominguez, Ben Hengst, Tia Sutton, Chris Grundler, Bill Charmley, Robin Moran, and Mike Olechiw, Clint Woods
Outside Attendees (in person): TBD

Confirmed 12/13 at 4pm: Request for...

RE: Request for Meeting

Message

From: David Schwietert [DSchwietert@autoalliance.org]
Sent: 4/4/2018 8:05:50 PM
To: Harlow, David [harlow.david@epa.gov]
Subject: RE: RealClearPolitics commentary by Bainwol

David,

I wanted to reconnect after running into you yesterday. Would you have time for a 5-10 min call later today or tomorrow?

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Sent: Tuesday, April 03, 2018 9:39 AM
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David S. Harlow
Senior Counsel
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
WJC-N Room 5409K

1200 Pennsylvania Avenue NW
Washington, DC 20460
202-564-1233
Harlow.David@epa.gov

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Subject: RealClearPolitics commentary by Bainwol

FYI

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Sent: Tuesday, April 03, 2018 9:05 AM
To: bowman.liz@epa.gov
Cc: Amy Dewey <dewey.amy@epa.gov>; David Schwietert <DSchwietert@autoalliance.org>
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https://www.realclearpolitics.com/articles/2018/04/03/revisiting_of_fuel_standards_is_not_a_rollback_136688.html

Revisiting of Fuel Standards Is Not a Rollback

COMMENTARY

By Mitch Bainwol
April 03, 2018

Washington is a town where truth can be elusive. Ideological agendas and herd reporting often distort issues. When it comes to auto policy, especially in today's highly charged political environment, sensationalism routinely warps reality. Here's an example:

Contrary to the breathless coverage of the Trump administration's action to revisit fuel economy and greenhouse gas emission standards, this decision actually fulfills key promises made by the prior administration. Early in Barack Obama's first term in office, automakers agreed with the president to establish long-term fuel economy targets stretching out to 2025. This bold plan, requiring massive investment by automakers to achieve a social goal we embraced -- addressing climate change -- came with two prudent obligations by policymakers.

First, President Obama and his team committed to undertake a midterm review halfway through the timeframe (2018) to check government predictions against reality and use that information to set standards for 2022-2025. The midterm look-back recognized the challenge of forecasting market and technology factors long into the

future, as well as the importance of using evidence-based analysis because the economic stakes were so significant.

Second, policymakers made a commitment to harmonize three regulatory programs that effectively serve the same purpose – managing fuel efficiency/carbon. National Highway Traffic Safety Administration, EPA and California's Air Resources Board all regulate emissions, but in different ways and with different timelines. Redundant government programs drive compliance costs up and that ultimately comes out of the wallets of our customers. The Obama administration stated in writing: "Continuing the National Program ensures that auto manufacturers can build a single fleet of U.S. vehicles that satisfy requirements of both federal programs as well as California's program."

Both of these commitments made sense. The agreement was sound. The goals were shared. And the plan was launched. But something funny happened on the way to the forum.

After the 2016 election, EPA chose to short-circuit the midterm analysis and advance a finding nearly 18 months before it was due. Politics took hold; marketplace realities were ignored. The federal program itself was split, with EPA jumping ahead of NHTSA. The original estimated targets were then justified and rushed through, irrespective of contradictory but salient market developments and irrespective of NHTSA's role in the process. Both commitments – the midterm and One National Program – were abrogated.

The market reality is clear. No factor is more relevant than gas prices, which remain significantly lower than projected. In reaction, consumers are buying more SUVs and trucks, bigger engines and fewer alternative powertrains than regulators expected. When the EPA issued the premature determination early last year, it trumpeted the statistic that automakers were over-complying. Weeks later, government reports indicated that statistic was no longer operative, and, for the first time, automakers missed the emissions targets despite achieving record fuel economy. Since then, compliance has slipped even further.

Remember, the government evaluates automakers on fuel economy standards by what consumers buy – not what automakers put in dealer showrooms. In short, the buying pattern of the American public has demonstrated that a rigid adherence to the standards -- as originally contemplated nearly a decade ago -- is inconsistent with market realities.

Moreover, two or three different regulatory rule sets make no sense. As such, we enthusiastically embrace the idea of One National Program. We did so when we signed up in 2011. We did so in the days immediately after the 2016 election and we do so now. Nothing has changed. Writing to the Trump transition team in November of 2016, we asked that "the White House lead efforts with EPA, NHTSA, CARB and the automakers on finding a pathway forward regarding the standards for 2022 MY and beyond."

Here we are, in April of 2018, the precise point at which the previous administration suggested a judgment be reached about whether to adjust the standards. The new administration has spent a year conducting research, looking at the unfolding data – and has reached the determination that adjustments are warranted.

"Adjustments" are not rollbacks. We favor standards that increase year over year. The industry is committed to ongoing progress in a journey that has no end date. After all, we have invested substantially in energy-efficient

technologies that we would like to see consumers embrace. We expect that fuel economy will keep rising. The only issue is at what speed. We do not buy the view that the 2012 projections were perfect and that conditions are unchanged. On the contrary, the projections were materially imperfect and conditions have fundamentally changed.

Even so, no matter how these standards ultimately adjust, the fuel savings through 2025 will likely achieve at least 97 percent of the original estimates. That's because there is profoundly more savings realized on the front end of the curve than on the back end – as moving from 10 to 20 miles per gallon produces 10 times more savings than moving from 40 to 50 miles per gallon.

We asked administration officials to look at the data and base their decision on marketplace realities. They have. We asked them to work with California to try to find a policy outcome that works for both. They are embarked on that mission. Let's give that a try. Too much is at stake to let politics and overheated rhetoric get in the way.

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202-326-5596 Desk
202-329-1398 Mobile
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Message

From: Harlow, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=B5A9A34E31FC4FE6B2BEADDDA2AFFA44-HARLOW, DAV]
Sent: 4/3/2018 1:35:29 PM
To: David Schwietert [DSchwietert@autoalliance.org]
Subject: RE: RealClearPolitics commentary by Bainwol

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David S. Harlow
Senior Counsel
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Office of Air and Radiation, USEPA
WJC-N Room 5409K
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Sent: 4/5/2018 11:30:09 AM
To: David Schwietert [DSchwietert@autoalliance.org]
Subject: RE: RealClearPolitics commentary by Bainwol

Dave,

Sure. Feel free to give me a ring – either 202-564-1233 or Ex. 6 - Personal Privacy – at your convenience. I should be around all day on Thursday.

David S. Harlow
Senior Counsel
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
WJC-N Room 5409K
1200 Pennsylvania Avenue NW
Washington, DC 20460
202-564-1233
Harlow.David@epa.gov

From: David Schwietert [mailto:DSchwietert@autoalliance.org]
Sent: Wednesday, April 4, 2018 4:06 PM
To: Harlow, David <harlow.david@epa.gov>
Subject: RE: RealClearPolitics commentary by Bainwol

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Ex. 6 Personal Privacy (PP) Mobile
www.autoalliance.org

Message

From: David Schwietert [DSchwietert@autoalliance.org]
Sent: 4/3/2018 5:09:07 PM
To: Jackson, Ryan [jackson.ryan@epa.gov]
Subject: RE: Auto Alliance Follow up
Attachments: Auto Alliance_7 Million Jobs Ad_Trump_WSJ_3.pdf

Here's the statement we issued yesterday. We'll continued to reinforce the objective nature of what the Administrator and Administration are doing.

The fight continues....

I think you may have been referencing this WSJ advertisement

Dave

https://autoalliance.org/2018/04/02/auto-alliance-statement-response-epas-announcement-midterm-review-fuel-economy-ghg-program/

April 2

Auto Alliance Statement in Response to EPA's Announcement about the Midterm Review of the Fuel Economy/GHG Program

- News Statements

This was the right decision, and we support the Administration for pursuing a data-driven effort and a single national program as it works to finalize future standards. We appreciate that the Administration is working to find a way to both increase fuel economy standards and keep new vehicles affordable to more Americans.

Today's announcement was the expected necessary step that sets in motion a future rulemaking where the government will propose a range of alternatives – sharing the data gathered to support various options — and seek public comments.

Automakers are committed to increasing fuel economy requirements and the key to achieving higher standards is selling more of the highly fuel-efficient vehicles, including 50 models of electric cars, now in dealer showrooms. Consumer research shows that the monthly payment is the top concern when car-shopping. So, to ensure ongoing fuel economy improvement, the wisest course of action is to keep new vehicles affordable so more consumers can replace an older car with a new vehicle that uses much less fuel – and offers more safety features.

Automakers continue to develop safety and other innovations and we want to get these technologies – and all their benefits – on the road as soon as possible.

Maintaining a single national program is critical to ensuring that cars remain affordable. We look forward to working with key stakeholders and the State of California once EPA and NHTSA begin a rulemaking. As in the past, we will review their proposed rule through the lens of its impact on jobs and meeting our customers' needs for affordable, safe, clean and fuel-efficient transportation.

From: Jackson, Ryan <jackson.ryan@epa.gov>
Sent: Tuesday, April 03, 2018 1:03 PM
To: David Schwietert <DSchwietert@autoalliance.org>
Subject: RE: Auto Alliance Follow up

Any kind of positive statements like you all did last March is appreciated. Keeps momentum and priority in front of the most appropriate audiences.

From: David Schwietert [mailto:DSchwietert@autoalliance.org]
Sent: Tuesday, April 3, 2018 12:51 PM
To: Letendre, Daisy <letendre.daisy@epa.gov>; Jackson, Ryan <jackson.ryan@epa.gov>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>; Bolen, Brittany <bolen.brittany@epa.gov>; Harlow, David <harlow.david@epa.gov>; Konkus, John <konkus.john@epa.gov>
Cc: Gloria Bergquist <GBERGQUIST@autoalliance.org>
Subject: Auto Alliance Follow up

Team EPA,

Thanks again for including us in today's press event. The Administrator did a nice job outlining why this decision is warranted, as well as next steps with NHTSA.

I wanted to pass along the chart that Mitch referenced in case it would be useful for the Administrator or others.

Talk soon,

Dave

From: David Schwietert
Sent: Tuesday, April 03, 2018 9:08 AM
To: 'Letendre, Daisy' <letendre.daisy@epa.gov>; 'Jackson, Ryan' <jackson.ryan@epa.gov>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>; 'bolen.brittany@epa.gov' <bolen.brittany@epa.gov>; 'harlow.david@epa.gov' <harlow.david@epa.gov>
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Liz, here is Mitch's op ed that is online now. Gloria

https://www.realclearpolitics.com/articles/2018/04/03/revisiting_of_fuel_standards_is_not_a_rollback_136688.html

Revisiting of Fuel Standards Is Not a Rollback

COMMENTARY

By Mitch Bainwol
April 03, 2018

Washington is a town where truth can be elusive. Ideological agendas and herd reporting often distort issues. When it comes to auto policy, especially in today's highly charged political environment, sensationalism routinely warps reality. Here's an example:

Contrary to the breathless coverage of the Trump administration's action to revisit fuel economy and greenhouse gas emission standards, this decision actually fulfills key promises made by the prior administration. Early in Barack Obama's first term in office, automakers agreed with the president to establish long-term fuel economy targets stretching out to 2025. This bold plan, requiring massive investment by automakers to achieve a social goal we embraced -- addressing climate change -- came with two prudent obligations by policymakers.

First, President Obama and his team committed to undertake a midterm review halfway through the timeframe (2018) to check government predictions against reality and use that information to set standards for 2022-2025. The midterm look-back recognized the challenge of forecasting market and technology factors long into the future, as well as the importance of using evidence-based analysis because the economic stakes were so significant.

Second, policymakers made a commitment to harmonize three regulatory programs that effectively serve the same purpose – managing fuel efficiency/carbon. National Highway Traffic Safety Administration, EPA and California's Air Resources Board all regulate emissions, but in different ways and with different timelines. Redundant government programs drive compliance costs up and that ultimately comes out of the wallets of our customers. The Obama administration stated in writing: "Continuing the National Program ensures that auto manufacturers can build a single fleet of U.S. vehicles that satisfy requirements of both federal programs as well as California's program."

Both of these commitments made sense. The agreement was sound. The goals were shared. And the plan was launched. But something funny happened on the way to the forum.

After the 2016 election, EPA chose to short-circuit the midterm analysis and advance a finding nearly 18 months before it was due. Politics took hold; marketplace realities were ignored. The federal program itself was split, with EPA jumping ahead of NHTSA. The original estimated targets were then justified and rushed through, irrespective of contradictory but salient market developments and irrespective of NHTSA's role in the process. Both commitments – the midterm and One National Program – were abrogated.

The market reality is clear. No factor is more relevant than gas prices, which remain significantly lower than projected. In reaction, consumers are buying more SUVs and trucks, bigger engines and fewer alternative powertrains than regulators expected. When the EPA issued the premature determination early last year, it trumpeted the statistic that automakers were over-complying. Weeks later, government reports indicated that statistic was no longer operative, and, for the first time, automakers missed the emissions targets despite achieving record fuel economy. Since then, compliance has slipped even further.

Remember, the government evaluates automakers on fuel economy standards by what consumers buy – not what automakers put in dealer showrooms. In short, the buying pattern of the American public has demonstrated that a rigid adherence to the standards -- as originally contemplated nearly a decade ago -- is inconsistent with market realities.

Moreover, two or three different regulatory rule sets make no sense. As such, we enthusiastically embrace the idea of One National Program. We did so when we signed up in 2011. We did so in the days immediately after the 2016 election and we do so now. Nothing has changed. Writing to the Trump transition team in November of 2016, we asked that "the White House lead efforts with EPA, NHTSA, CARB and the automakers on finding a pathway forward regarding the standards for 2022 MY and beyond."

Here we are, in April of 2018, the precise point at which the previous administration suggested a judgment be reached about whether to adjust the standards. The new administration has spent a year conducting research, looking at the unfolding data – and has reached the determination that adjustments are warranted.

"Adjustments" are not rollbacks. We favor standards that increase year over year. The industry is committed to ongoing progress in a journey that has no end date. After all, we have invested substantially in energy-efficient technologies that we would like to see consumers embrace. We expect that fuel economy will keep rising. The only issue is at what speed. We do not buy the view that the 2012 projections were perfect and that conditions are unchanged. On the contrary, the projections were materially imperfect and conditions have fundamentally changed.

Even so, no matter how these standards ultimately adjust, the fuel savings through 2025 will likely achieve at least 97 percent of the original estimates. That's because there is profoundly more savings realized on the front end of the curve than on the back end – as moving from 10 to 20 miles per gallon produces 10 times more savings than moving from 40 to 50 miles per gallon.

We asked administration officials to look at the data and base their decision on marketplace realities. They have. We asked them to work with California to try to find a policy outcome that works for both. They are embarked on that mission. Let's give that a try. Too much is at stake to let politics and overheated rhetoric get in the way.

Mitch Bainwol is president and CEO of the Auto Alliance, the leading automotive advocacy group composed of 12 automakers.

GLORIA BERGQUIST
Vice President, Communications and Public Affairs

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Message

From: Karr Shane (FCA) [roger.karr@fcagroup.com]
Sent: 7/12/2017 12:41:31 PM
To: Jackson, Ryan [jackson.ryan@epa.gov]; Traylor, Patrick [traylor.patrick@epa.gov]
Subject: FW: U.S. EPA chief says to treat diesel emissions cheating 'very aggressively'

Importance: High

Ryan & Patrick:

Good morning. I left you both voice messages late yesterday and certainly understand you are very busy. I would appreciate the opportunity to speak to one of you today regarding the story below. My direct at the office is 202-414-6763 and my cell is 202-360-1187. Thank you.

Shane

U.S. EPA chief says to treat diesel emissions cheating 'very aggressively'
Reuters
By: Valerie Volcovici and David Shepardson
11 July 2017
Link: http://www.cnbc.com/2017/07/11/reuters-america-u-s-epa-chief-says-to-treat-diesel-emissions-cheating-very-aggressively.html

WASHINGTON, July 11 (Reuters) - U.S. Environmental Protection Agency chief Scott Pruitt said the agency must ensure Volkswagen AG's excess diesel emissions is not repeated, and will treat improper behavior by automakers "very aggressively."

Since Volkswagen admitted in September 2015 to illegally using software to evade emissions regulations, the EPA has been investigating diesel issues in a number of other automakers including Fiat Chrysler Automobiles NV and Daimler AG .

In March, VW pleaded guilty to three felonies in a U.S. court and faces three years of probation and oversight by a court appointed monitor. The automaker has agreed to spend more than $25 billion on buybacks, fines and environmental efforts.

The U.S. Justice Department sued Fiat Chrysler Automobiles NV in May and accused the Italian-American automaker of illegally using software to bypass emission controls in 104,000 diesel vehicles sold since 2014.

"What VW did was very, very troublesome and we need to make sure it doesnt happen again," Pruitt told Reuters in an interview late Monday.

Pruitt said the agency must take an aggressive stance to deter cheating by automakers.

"Look what VW, and Fiat - you have this Fiat case that is on the horizon as well. The emails and the communications that Im aware of - it was strategic and intentional and should be dealt with very aggressively," Pruitt said.

Asked whether he thought the Obama administration dealt with Volkswagen too harshly, Pruitt responded: "I wouldnt call what was done too light at all."

Reuters reported in May the Justice Department and EPA obtained internal Fiat emails and other documents written in Italian that look at engine development and emissions issues and that raise significant questions.

The Justice Department suit in May named Fiat Chrysler's unit VM Motori SpA, which designed the engine in question.

Fiat Chrysler Chief Executive Sergio Marchionne said in June the automaker has been working with EPA for months and "is confident of the fact that there was no intention on our part to set up a defeat device that was even remotely similar to what (Volkswagen) had in their cars."

Pruitt added in the interview that the EPA is not currently reviewing California's waiver under the Clean Air Act to set its own vehicle emissions rules.

"Weve reached out to the California governor as part of our CAFE midterm review in 2018. Im hopeful that the state of California, the governor there, will respond with reciprocity and we are working through that process," Pruitt said.

Pruitt said he thinks it is important to have talks with California as they consider whether to revise the 2022 through 2025 vehicle emissions rules.

Message

From: Biesecker, Michael [MBiesecker@ap.org]
Sent: 8/10/2017 11:14:05 PM
To: Bowman, Liz [Bowman.Liz@epa.gov]; Wilcox, Jahan [wilcox.jahan@epa.gov]
CC: Jackson, Ryan [jackson.ryan@epa.gov]; Pace, Julie [JPace@ap.org]
Subject: RE: Pruitt North Dakota visit

Sorry, not seeing a link

From: Bowman, Liz [mailto:Bowman.Liz@epa.gov]
Sent: Thursday, August 10, 2017 7:14 PM
To: Biesecker, Michael; Wilcox, Jahan
Cc: Jackson, Ryan; Pace, Julie
Subject: RE: Pruitt North Dakota visit

Here is a link to our release on the event, which includes photos you are welcome to use for your article.

From: Bowman, Liz
Sent: Thursday, August 10, 2017 7:10 PM
To: 'Biesecker, Michael' <MBiesecker@ap.org>; Wilcox, Jahan <wilcox.jahan@epa.gov>
Cc: Jackson, Ryan <jackson.ryan@epa.gov>; 'Pace, Julie' <JPace@ap.org>
Subject: RE: Pruitt North Dakota visit

You can also add that: "This bipartisan event with the community's farmers – which included North Dakota Governor Doug Burgum, U.S. Senator John Hoeven, U.S. Congressman Kevin Cramer, North Dakota Lt. Governor Brent Sanford, North Dakota Attorney General Wayne Stenehjem, a representative from U.S. Senator Heidi Heitkamp's office, and other state officials – was closed to the press so people can contribute without worrying about reporters in the room and how they may characterize their contributions."

Thanks – Liz

From: Bowman, Liz
Sent: Thursday, August 10, 2017 5:54 PM
To: 'Biesecker, Michael' <MBiesecker@ap.org>; Wilcox, Jahan <wilcox.jahan@epa.gov>
Cc: Jackson, Ryan <jackson.ryan@epa.gov>; 'Pace, Julie' <JPace@ap.org>
Subject: RE: Pruitt North Dakota visit

Here's our on the record response, which you can attribute to me: "The AP should be reporting on this week's news, like the Administration fulfilling its commitment to reinstate the midterm evaluation of fuel economy and GHG standards for cars and light trucks, or EPA's cooperative federalism approach to finding the best strategy for the safe disposal of coal ash in each state – not attacking our hard-working staff for a miscommunication between two government offices."

From: Biesecker, Michael [mailto:MBiesecker@ap.org]
Sent: Thursday, August 10, 2017 5:37 PM
To: Wilcox, Jahan <wilcox.jahan@epa.gov>
Cc: Jackson, Ryan <jackson.ryan@epa.gov>; Bowman, Liz <Bowman.Liz@epa.gov>
Subject: RE: Pruitt North Dakota visit

Jahan,

Still not gotten a response to the prior questions.

One other thing I'd like to clear up: You characterized the reporters as "individuals that were not invited came to the event."

AP spoke with the office of ND Gov. Doug Burgum, which said there was in fact a notice sent to local media inviting them the attend a 15-minute open session at the end of the round table. The governor's staff told AP: "That was a misunderstanding between our office and Administrator Pruitt's office. We were later informed (by Pruitt's office) it would be closed."

Why did EPA request to close the round table to the press?

Please provide on-the-record response this time.

Thanks,

Michael

From: Biesecker, Michael
Sent: Thursday, August 10, 2017 4:41 PM
To: 'Wilcox, Jahan'; Pace, Julie
Cc: Jackson, Ryan; Bowman, Liz
Subject: RE: Pruitt North Dakota visit

Jahan,

Just to clarify, so I can make sure I understand, when you write "we were asked to refer them to security." By "security," are you referring to the university's police department? And by "we," do you mean EPA staff called police?

Thanks,

Michael

From: Wilcox, Jahan [mailto:wilcox.jahan@epa.gov]
Sent: Thursday, August 10, 2017 4:36 PM
To: Biesecker, Michael; Pace, Julie
Cc: Jackson, Ryan; Bowman, Liz
Subject: RE: Pruitt North Dakota visit

Off-the-record, what is inaccurate is your assertion that reporters were threatened with arrest for trying to access a round-table meeting. Law enforcement at the University of North Dakota declared the area as private property, which was accurately reported and when individuals that were not invited came to the event, we were asked to refer them to security.

From: Biesecker, Michael [mailto:MBiesecker@ap.org]
Sent: Thursday, August 10, 2017 4:21 PM
To: Wilcox, Jahan <wilcox.jahan@epa.gov>; Pace, Julie <JPace@ap.org>
Cc: Jackson, Ryan <jackson.ryan@epa.gov>; Bowman, Liz <Bowman.Liz@epa.gov>
Subject: RE: Pruitt North Dakota visit

Jahan,

We are simply trying to ascertain what happened.

The newspaper reported:

When two Herald reporters went to the EERC before the start of the event, they were asked by representatives of Pruitt to leave the grounds before EPA spokesman Jahan Wilcox threatened to call police, whom he referred to as "security."

A UND Police officer then arrived to insist the building and its grounds were private property before demanding the reporters move away from the center's front door. An officer had earlier told a pair of protesters the same thing, asking them to cross a road away from the center. The EERC is not private property and is owned by UND.

Is any of that erroneous?

Also, I'm not sure how AP was supposed to report on Pruitt's meeting when it was closed press. I'm also not aware that I received any notice or readout from the event. Did you guys send me something that I missed?

Thanks,

Michael

From: Wilcox, Jahan [mailto:wilcox.jahan@epa.gov]
Sent: Thursday, August 10, 2017 4:08 PM
To: Pace, Julie; Biesecker, Michael
Cc: Jackson, Ryan; Bowman, Liz
Subject: FW: Pruitt North Dakota visit

Julie -

Off-the-record, why didn't the national AP reporter write on our trip to Iowa, North Dakota, Texas to talk directly with people about EPA regulations – or EPA's announcements today on CCR or MTE – major policy and environmental announcements. Rather than focus on news, he is fixating on us.

Also, our event yesterday at the University of North Dakota was closed press and the host of the event said it was private property as stated by both the local police and the officials at UND. I'm a little confused how Michael believes someone was "threatened" with arrest when the story clearly states I referred to security at the event. No mention of arrest or police was ever stated or reported.

- "When two Herald reporters went to the EERC before the start of the event, they were asked by representatives of Pruitt to leave the grounds before EPA spokesman Jahan Wilcox threatened to call police, whom he referred to as 'security.' A UND Police officer then arrived to insist the building and its grounds were private property before demanding the reporters move away from the center's front door. An officer had earlier told a pair of protesters the same thing, asking them to cross a road away from the center. The EERC is not private property and is owned by UND."

http://www.grandforksherald.com/news/4310124-epa-chief-pruitt-holds-series-closed-door-meetings-gf-fargo?wpisrc=nl_energy202&wpmm=1

Please let me know if you are writing on this and need an on the record statement.

From: Biesecker, Michael [mailto:MBiesecker@ap.org]
Sent: Thursday, August 10, 2017 3:46 PM
To: Wilcox, Jahan <wilcox.jahan@epa.gov>; Bowman, Liz <Bowman.Liz@epa.gov>
Subject: Pruitt North Dakota visit

Liz, Jahan,

AP is following up on reports about Pruitt's visit to N.D. yesterday, where Jahan is reported to have threatened reporters from the Grand Forks Herald with arrest for trying to access a round-table meeting held at a public university.

Does EPA dispute any of the Herald's account of what occurred? If so, please provide details.

http://www.grandforksherald.com/news/4310124-epa-chief-pruitt-holds-series-closed-door-meetings-gf-fargo?wpisrc=nl_energy202&wpmm=1

Thanks,

Michael

AP

ASSOCIATED PRESS

Michael Biesecker
Reporter
mbiesecker@ap.org
Twitter: @mbieseck
Public Key

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Washington, D.C. 20005-4076

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M 202-465-6091

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"There are only two forces that can carry light to all corners of the globe – the sun in the heavens and The Associated Press down here." – Mark Twain, 1906

"I go with Custer and will be at the death." – AP reporter Mark Kellogg's final dispatch from the Battle of the Little Bighorn, 1876

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Message

From: David Schwietert [DSchwietert@autoalliance.org]
Sent: 4/3/2018 1:40:14 PM
To: Jackson, Ryan [jackson.ryan@epa.gov]
Subject: RE: RealClearPolitics commentary by Bainwol

Mitch felt context was important and something that various reporters and the public would benefit from reading

See you later this AM if you plan to attend the 10:30 press event

Dave

From: Jackson, Ryan <jackson.ryan@epa.gov>
Sent: Tuesday, April 03, 2018 9:36 AM
To: David Schwietert <DSchwietert@autoalliance.org>
Cc: Letendre, Daisy <letendre.daisy@epa.gov>; Gunasekara, Mandy <Gunasekara.Mandy@epa.gov>; Bolen, Brittany <bolen.brittany@epa.gov>; Harlow, David <harlow.david@epa.gov>
Subject: Re: RealClearPolitics commentary by Bainwol

Thanks.

Ryan Jackson
Chief of Staff
U.S. EPA
202-564-6999

On Apr 3, 2018, at 9:07 AM, David Schwietert <DSchwietert@autoalliance.org> wrote:

> FYI
>
> ---
>
> **From:** Gloria Bergquist
> **Sent:** Tuesday, April 03, 2018 9:05 AM
> **To:** bowman.liz@epa.gov
> **Cc:** Amy Dewey <dewey.amy@epa.gov>; David Schwietert <DSchwietert@autoalliance.org>
> **Subject:** RealClearPolitics commentary by Bainwol
>
> Liz, here is Mitch's op ed that is online now. Gloria
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> https://www.realclearpolitics.com/articles/2018/04/03/revisiting_of_fuel_standards_is_not_a_rollback_136688.html

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Both of these commitments made sense. The agreement was sound. The goals were shared. And the plan was launched. But something funny happened on the way to the forum.

After the 2016 election, EPA chose to short-circuit the midterm analysis and advance a finding nearly 18 months before it was due. Politics took hold; marketplace realities were ignored. The federal program itself was split, with EPA jumping ahead of NHTSA. The original estimated targets were then justified and rushed through, irrespective of contradictory but salient market developments and irrespective of NHTSA's role in the process. Both commitments – the midterm and One National Program – were abrogated.

The market reality is clear. No factor is more relevant than gas prices, which remain significantly lower than projected. In reaction, consumers are buying more SUVs and trucks, bigger engines and fewer alternative powertrains than regulators expected. When the EPA issued the premature determination early last year, it trumpeted the statistic that automakers were over-complying. Weeks later, government reports indicated that statistic was no longer operative, and, for the first time, automakers missed the emissions targets despite achieving record fuel economy. Since then, compliance has slipped even further.

Remember, the government evaluates automakers on fuel economy standards by what consumers buy – not what automakers put in dealer showrooms. In short, the buying pattern of the American public has demonstrated that a rigid adherence to the standards -- as originally contemplated nearly a decade ago -- is inconsistent with market realities.

Moreover, two or three different regulatory rule sets make no sense. As such, we enthusiastically embrace the idea of One National Program. We did so when we signed up in 2011. We did so in the days immediately after the 2016 election and we do so now. Nothing has changed. Writing to the Trump transition team in November of 2016, we asked that "the White House lead efforts with EPA, NHTSA, CARB and the automakers on finding a pathway forward regarding the standards for 2022 MY and beyond."

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Mitch Bainwol is president and CEO of the Auto Alliance, the leading automotive advocacy group composed of 12 automakers.

GLORIA BERGQUIST
Vice President, Communications and Public Affairs

Alliance of Automobile Manufacturers <image003.jpg>
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Message

From: Tucker, Jamie [jtucker@AKINGUMP.COM]
Sent: 1/8/2018 1:25:50 AM
To: Lewis, Josh [Lewis.Josh@epa.gov]
Subject: Re: Meeting Request re: Natural Gas Vehicles

Thanks.

On Jan 5, 2018, at 3:53 PM, Lewis, Josh <Lewis.Josh@epa.gov> wrote:

Jamie,

Sorry for the delay in responding. Wanted to acknowledge receipt and let you know we'll be in touch soon to follow up.

Josh Lewis
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 564 2095
Cell: Ex. 6 Personal Privacy (PP)

From: Tucker, Jamie [mailto:jtucker@AKINGUMP.COM]
Sent: Wednesday, January 03, 2018 3:21 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Cc: Feeley, Drew (Robert) <Feeley.Drew@epa.gov>
Subject: Meeting Request re: Natural Gas Vehicles

Emily/Josh - On behalf of VNG.Co, a natural gas vehicle fueling infrastructure company, we wanted to see if Assistant Administrator Wehrum would be available this month to discuss a number of administrative and legislative policy changes the company is advocating to promote the adoption of natural gas vehicles largely by leveling the playing field with electric vehicles. We have had recent conversations with the Office of Policy as well as the Office of Transportation and Air Quality to discuss these proposals as well as with staff at the White House and Department of Transportation. With Mr. Wehrum's confirmation we would like to fold him into the conversation as well.

Natural gas vehicles provide a cost effective and additional pathway for automaker emissions compliance while preserving the products' consumer appeal, and are therefore worthy of being included in a portfolio of solutions along with EVs to achieve the objectives.

Among the key advantages of the proposed regulatory changes is the benefit to achieving emissions reductions in the light-duty truck category which accounts for 64% of new vehicle purchases (and are responsible for even greater amounts of fuel use and pollution if you take into account the differential in fuel economy between light-duty trucks and passenger cars), and for which there is not a viable electrification solution.

Specifically, we would encourage the Administration to consider:

- **Restoring the 0.15 "divisor"** in EPA's compliance calculations, equivalent to NHTSA's statutory Petroleum Equivalency Factor that counts a gallon-equivalent of natural gas as 0.15 gallons of gasoline. The previous Administration ended this powerful incentive while simultaneously providing electric vehicles with additional emissions incentives on the hope that EVs would be "game changers." The game has now changed for NGVs. The shale revolution that has occurred

since the current rules were set as well the development of Renewable Natural Gas as the lowest carbon vehicle fuel are true game changers that strongly justify returning to the 0.15 divisor.

The powerful and well-justified incentive of the 0.15 divisor would be complemented and made even more effective by additional changes including:

- **Eliminating range requirements on bi-fuel NGVs** that results in an impractical natural gas tank size requirement that is twice the size of the gasoline tank and costly design requirements for NGVs, whereas no such range requirements exists for hybrid electric vehicles. This is the most important regulatory change as a complement to the 0.15 divisor of the three.

- **Providing NGV pick-ups with the bonus credits** provided to "strong electric hybrid pick-ups" and **eliminating the existing minimum 10% deployment threshold** to qualify for pickup bonus credits.

- **Establishing a new incentive to encourage retrofitting existing gasoline and diesel vehicles to run on natural gas**, something that isn't feasible for electric drives but which will reduce emissions by the existing fleet of vehicles

Enclosed for your further consideration are our Midterm Evaluation comments as well as information outlining the rationale for the recommended regulatory changes.

Thank you for your consideration.

Jamie

Jamie Tucker
AKIN GUMP STRAUSS HAUER & FELD LLP
1333 New Hampshire Avenue, N.W. | Washington, DC 20036-1564 | USA | Direct: +1 202.887.4279 | Internal: 24279
Fax: +1 202.887.4288 | jtucker@akingump.com | akingump.com | Bio

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Appointment

From: Lewis, Josh [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=B22D1D3BB3F84436A524F76AB6C79D7E-JOLEWIS]
Sent: 12/13/2017 12:32:33 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Harlow, David [harlow.david@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Sutton, Tia [sutton.tia@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Charmley, William [charmley.william@epa.gov]; Moran, Robin [moran.robin@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Woods, Clinton [woods.clinton@epa.gov]

Subject: Meet with National Coalition for Advanced Transportation (NCAT) (Confirmed)
Attachments: RE: Request for Meeting; Confirmed 12/13 at 4pm: Request for Meeting
Location: WJC-N 5400 + Video with AA - Ex. 6 Personal Privacy (PP)

Start: 12/13/2017 2:30:00 PM
End: 12/13/2017 3:15:00 PM
Show Time As: Tentative

To: Bill Wehrum, Mandy Gunasekara, David Harlow, Alex Dominguez, Ben Hengst, Tia Sutton, Chris Grundler, Bill Charmley, Robin Moran, and Mike Olechiw, Clint Woods
Outside Attendees (in person): TBD

Confirmed 12/13 at 4pm: Request for...

RE: Request for Meeting

Message

From: Lewis, Josh [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=B22D1D3BB3F84436A524F76AB6C79D7E-JOLEWIS]
Sent: 12/12/2017 10:22:07 PM
To: ROBERT.WYMAN@lw.com; Atkinson, Emily [Atkinson.Emily@epa.gov]
CC: Loving, Shanita [Loving.Shanita@epa.gov]
Subject: RE: Confirmed 12/13 at 4pm: Request for Meeting

We can also start the NCAT meeting at 9:30 to allow for a full breakfast. He's in meetings the rest of the day so I'll send him an email and we'll figure this out before the morning

Josh

-----Original Message-----
From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Tuesday, December 12, 2017 5:10 PM
To: Lewis, Josh <Lewis.Josh@epa.gov>; Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Confirmed 12/13 at 4pm: Request for Meeting

Josh - can you ask Bill if he might be available for breakfast a tad earlier than our planned 8 am time (say, 7:30 or 7:45 am)? Otherwise, it will be an awfully short breakfast.

-----Original Message-----
From: Lewis, Josh [mailto:Lewis.Josh@epa.gov]
Sent: Tuesday, December 12, 2017 1:49 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>; Wyman, Robert (LA) <ROBERT.WYMAN@lw.com>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Confirmed 12/13 at 4pm: Request for Meeting

Bob,

Bill had a meeting come up tomorrow afternoon that conflicts with your 4 pm. Are you able to come in earlier in the day...say, at 9 am, right after your breakfast with Bill?

Josh Lewis
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 564 2095
Cell: Ex. 6 Personal Privacy (PP)

-----Original Message-----
From: Atkinson, Emily
Sent: Wednesday, November 22, 2017 8:49 AM
To: Robert.Wyman@LW.com
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: Confirmed 12/13 at 4pm: Request for Meeting

Hi Bob,

You are confirmed for a 45 minute in person meeting on Wednesday, December 13, 2017 at 4:00pm with Bill Wehrum.

Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left - that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.

Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Acting Assistant Administrator Office of Air and Radiation, USEPA Room 5412B, 1200 Pennsylvania Avenue NW Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

-----Original Message-----
From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Tuesday, November 21, 2017 4:57 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Request for Meeting

Yes, definitely. Thank you.

_____
From: Atkinson, Emily <Atkinson.Emily@epa.gov>
Sent: Tuesday, November 21, 2017 1:48:14 PM
To: Wyman, Robert (LA)
Cc: Loving, Shanita
Subject: RE: Request for Meeting

Hi Bob,

It looks like Bill Wehrum could be available for a 45 minute in person meeting on Wednesday, December 13, 2017 at 4:00pm.

Please advise if this could work on your end.

Thank you.
Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Acting Assistant Administrator Office of Air and Radiation, USEPA Room 5412B, 1200 Pennsylvania Avenue NW Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Friday, November 17, 2017 6:03 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Request for Meeting

Emily - thank you for speaking with me by telephone earlier today. I am writing to request a meeting with Bill Wehrum on the subject of the midterm evaluation and the national greenhouse gas emissions standards for motor vehicles. I make this request on behalf of the National Coalition for Advanced Transportation (NCAT).

NCAT is a coalition of leading companies that support electric vehicle and other advanced transportation technologies and related infrastructure, including through: energy supply, transmission and distribution; vehicle and component design and manufacturing; charging infrastructure, battery and other energy-storage technology design, production and implementation; infrastructure engineering and construction; and the movement of passengers, goods and services; among other activities. Prior to our meeting, I will provide a list of NCAT attendees.

If possible, we would like to meet with Mr. Wehrum and appropriate staff, as he determines, on Wednesday, December 13, at any time. Of course, we recognize that his schedule may not permit meeting on this date, in which case we will do our best to accommodate whatever date he selects.

Sincere thanks.

Bob

Robert A. Wyman, Jr.
LATHAM & WATKINS LLP
Email: robert.wyman@lw.com<mailto:robert.wyman@lw.com>

355 South Grand Avenue
Los Angeles, CA 90071-1560
Direct: +1.213.891.8346

555 Eleventh Street, NW
Washington, DC 20004-1304
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Latham & Watkins LLP

Message

From: Lieske, Christopher [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=C836C7DEA7054DD8807120A1D401CAC8-LIESKE, CHRISTOPHER]
Sent: 10/26/2017 12:55:26 PM
To: Barbara J. Bauer [Barbara_Bauer@abtassoc.com]; Brunner, Christine [brunner.christine@epa.gov]
CC: Melissa Spivey [Melissa_Spivey@abtassoc.com]; Marissa Hoer [Marissa_hoer@abtassoc.com]; Vanessa Ehrenpreis [Vanessa_Ehrenpreis@abtassoc.com]
Subject: RE: MTE Comments--Question

Yes, I was looking at the original version of the outline.

From: Barbara J. Bauer [mailto:Barbara_Bauer@abtassoc.com]
Sent: Thursday, October 26, 2017 8:01 AM
To: Lieske, Christopher <lieske.christopher@epa.gov>; Brunner, Christine <brunner.christine@epa.gov>
Cc: Melissa Spivey <Melissa_Spivey@abtassoc.com>; Marissa Hoer <Marissa_hoer@abtassoc.com>; Vanessa Ehrenpreis <Vanessa_Ehrenpreis@abtassoc.com>
Subject: RE: MTE Comments--Question

15.1 is "General Comments Regarding EPA's Analysis of MY 2022-2025 GHG Standards." Did you mean 16.2 "Biofuels?"

Barbara Bauer | Associate | CommentCounts Product Manager | Abt Associates
5001 South Miami Blvd, Suite 210| Durham, NC 27703
Ex. 6 Personal Privacy (PP) | F: 301-828-9715| www.abtassociates.com

BOLD THINKERS DRIVING REAL-WORLD IMPACT

COMMENT COUNTS

From: Lieske, Christopher [mailto:lieske.christopher@epa.gov]
Sent: Thursday, October 26, 2017 7:55 AM
To: Barbara J. Bauer; Brunner, Christine
Cc: Melissa Spivey; Marissa Hoer; Vanessa Ehrenpreis
Subject: RE: MTE Comments--Question

Hi Chris and Barbara –

I recommend placing anything ethanol related including FFVs under biofuels, section 15.1. Thanks.

From: Barbara J. Bauer [mailto:Barbara_Bauer@abtassoc.com]
Sent: Tuesday, October 24, 2017 9:10 AM
To: Brunner, Christine <brunner.christine@epa.gov>; Lieske, Christopher <lieske.christopher@epa.gov>
Cc: Melissa Spivey <Melissa_Spivey@abtassoc.com>; Marissa Hoer <Marissa_hoer@abtassoc.com>; Vanessa Ehrenpreis <Vanessa_Ehrenpreis@abtassoc.com>
Subject: MTE Comments--Question

Hi Chris and Chris,

I am reviewing several comment documents (NHTSA 0189, EPA 9009, EPA 6600, and EPA 10130 (Pearson, et al)), submitted by Noyes Law Corporation on behalf of Pearson Fuels. I need your input for correct placement in the outline. The theme of the comments revolves around the upcoming NHTSA EIS, FFVs, California data, and E85/ethanol. Here is a the basic argument:

A review of the Notice reveals that it does not contain a single reference to ethanol. Similarly, NHTSA's EIS analysis for the MY 2017-2025 CAFE standards failed to recognize that the quantity of ethanol substituted for petroleum is a critical policy and environmental variable that merits attention both in the EIS process and in the design of the CAFE policy framework. Since CAFE's fundamental purpose is to reduce U.S. reliance on foreign oil, this Comment asserts that NHTSA is legally obligated to consider various measures to maximize ethanol use in vehicles as a reasonable alternative since ethanol is a proven and feasible means to reduce petroleum imports, to reduce environmental impacts, and to provide significant GHG reduction benefits.

To support its arguments, this Comment provides E85 usage data and E85 pricing information from California due to the available high quality data, and because California is already using ethanol to reduce petroleum imports and GHG emissions. The Comment examines how changes to the CAFE policy framework have already caused both a boom and a bust in the manufacture of flex fuel vehicles (FFVs). Looking forward, it describes how a strategic CAFE policy framework can leverage FFVs and E85 stations as a bridge to facilitate the transition to high octane vehicles that will reduce costs to consumers and enable fulfillment of EPCA's and EISA's objectives. It concludes by emphasizing the importance of revisiting E85 and FFV assumptions, and initiating an immediate re-examination of the appropriate F factor for FFVs.

Outline sections 16.4, Other Fuels Issues and 22.3, Comments outside the scope of the MTE are possibilities. What do you think?

Thanks!

Barbara Bauer | Associate | CommentCounts Product Manager | Abt Associates
5001 South Miami Blvd, Suite 210| Durham, NC 27703
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Message

From: Lieske, Christopher [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=C836C7DEA7054DD8807120A1D401CAC8-LIESKE, CHRISTOPHER]
Sent: 10/16/2017 12:40:40 PM
To: Curt Wells [cwells@aluminum.org]
Subject: RE: Aluminum Association Midterm Evaluation Comments

Curt –

This is great, thanks. There is no need for you to submit the revised file through regulations.gov. We will swap out the file.

Thanks again,

Chris

From: Curt Wells [mailto:cwells@aluminum.org]
Sent: Sunday, October 15, 2017 9:56 PM
To: Lieske, Christopher <lieske.christopher@epa.gov>
Subject: RE: Aluminum Association Midterm Evaluation Comments

Chris –

Attached is the referenced attachment for public consumption. It is the same document submitted to the docket will all references to confidentiality removed. Please let me know if you or your staff will now place this in the docket or if I need to go into the docket and do it (which may not be possible since the comment period has closed)..

Thanks.

Curt.

From: Lieske, Christopher [mailto:lieske.christopher@epa.gov]
Sent: Thursday, October 12, 2017 11:05 AM
To: Curt Wells <cwells@aluminum.org>
Subject: Aluminum Association Midterm Evaluation Comments

Hello Mr. Wells –

I am contacting you regarding your comments on EPA's Midterm Evaluation Reconsideration. Our docket staff asked that I reach out to you regarding one of the documents, attached, that the Aluminum Association submitted with their comments through regulations.gov. The document's pages are marked confidential and copyrighted, although the file name is marked "PUBLIC." Documents that are confidential are withheld from the public docket and documents that are copyrighted have restricted public access (they are not available to the public online through regulations.gov).

Could you please confirm whether the document, a presentation titled "Aluminum Content in North American Light Vehicles 2016 to 2018," Summary Report, July 2017, should be treated as confidential and withheld from the public docket, should be treated as not confidential but copyrighted with restricted public access, or should be treated as not confidential or copyrighted and released with full access to the public through regulations.gov?

Thank you and please let me know if you have any questions.

Chris

Chris Lieske
EPA, Office of Transportation and Air Quality
2000 Traverwood
Ann Arbor, MI 48105
734-214-4584

Message

From: Lieske, Christopher [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=C836C7DEA7054DD8807120A1D401CAC8-LIESKE, CHRISTOPHER]
Sent: 11/15/2017 1:50:51 PM
To: Barbara J. Bauer [Barbara_Bauer@abtassoc.com]; Brunner, Christine [brunner.christine@epa.gov]
CC: Vanessa Ehrenpreis [Vanessa_Ehrenpreis@abtassoc.com]; Marissa Hoer [Marissa_hoer@abtassoc.com]; Melissa Spivey [Melissa_Spivey@abtassoc.com]
Subject: RE: EDF Attachments Submitted to MTE Docket
Attachments: EDF et al Comments.pdf

Hi Chris and Barbara –

The attached, which is a joint comment with EDF as the lead but with other organizations included as well, should be considered the primary EDF comment for purposes of the attachments. Also, that's great news regarding the comment coding. Thanks!

From: Barbara J. Bauer [mailto:Barbara_Bauer@abtassoc.com]
Sent: Wednesday, November 15, 2017 8:31 AM
To: Brunner, Christine <brunner.christine@epa.gov>; Lieske, Christopher <lieske.christopher@epa.gov>
Cc: Vanessa Ehrenpreis <Vanessa_Ehrenpreis@abtassoc.com>; Marissa Hoer <Marissa_hoer@abtassoc.com>; Melissa Spivey <Melissa_Spivey@abtassoc.com>
Subject: EDF Attachments Submitted to MTE Docket

Hello Chris and Chris,

EDF submitted multiple attachments under different docket ID numbers—see list below. However, we can't find the actual individual EDF comment document. EDF did join with other organizations on two comment submission, but we didn't find any individual comment submission from EDF only. We thought an EDF submission would eventually show up in the docket to accompany the many attachments, but it hasn't so far. I'm wondering if EPA has an individual submission from EDF??

If there is no EDF individual comment, I'm a little puzzled about how to handle the 100+ attachments. We would normally attach them to EDF's record in CommentCounts, but since there is no comment submission and thus no individual EDF record, I'm wondering about the best way to handle the attachments. We could add all the attachments to one of the group submissions that includes EDF, or we could just add a note in the CommentCounts Notes Field informing the reader of the attachments. Your thoughts?

Also, we completed the coding of all available MTE comments, including mass comment campaigns, and should have them entered in CommentCounts by the end of the week. We continue to review the citizen comments (hundreds more were added to the docket this week) and the public hearing transcript.

Thanks!

Barbara Bauer | Associate | CommentCounts Product Manager | Abt Associates
5001 South Miami Blvd, Suite 210| Durham, NC 27703
O: 919-294-7781 | F: 301-828-9715| www.abtassociates.com

Abt BOLD THINKERS DRIVING REAL-WORLD IMPACT

COMMENT COUNTS

From: Melissa Spivey
Sent: Tuesday, November 14, 2017 1:00 PM
To: Barbara J. Bauer
Subject: EDF attachments submitted to MTE docket

Hi Barbara,

Here is a breakdown of the various EDF documents submitted to the MTE docket. Each electronic cover letter had the same statement:

Environmental Defense Fund is submitting the attached documents in support of our comment, which is responsive to EPA's notice of reconsideration of the Final Determination of the Midterm Evaluation for light-duty vehicle GHG emissions standards.

Here is a list of the Docket Numbers along with the number of attachments:

EPA-HQ-OAR-2015-0827-9091 – Cover sheet only. Attachment information in on the cover sheet. Attachments were too big to submit to regulations.gov

EPA-HQ-OAR-2015-0827-9180 – 20 attachments

EPA-HQ-OAR-2015-0827-9181 – 20 attachments

EPA-HQ-OAR-2015-0827-9183 – 13 attachments

EPA-HQ-OAR-2015-0827-9184 – 20 attachments

EPA-HQ-OAR-2015-0827-9185 – 20 attachments

EPA-HQ-OAR-2015-0827-9190 – Cover sheet only. Attachment information in on the cover sheet. Attachments were too big to submit to regulations.gov

EPA-HQ-OAR-2015-0827-9192 – 20 attachments

EPA-HQ-OAR-2015-0827-9193 – 17 attachments

EPA-HQ-OAR-2015-0827-9578 – 13 attachments

EPA-HQ-OAR-2015-0827-9722 – 6 attachments

EPA-HQ-OAR-2015-0827-9726 – 1 attachment

Let me know if you have any questions!

Melissa Spivey | Analyst, Environment & Resources | Abt Associates
5001 South Miami Blvd, Suite 210| Durham, NC 27703
O: 919-294-7849 | F: 617-386-8611| www.abtassociates.com

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October 5, 2017

Submitted via http://www.regulations.gov

Re: Request for Comment on Reconsideration of the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022–2025 Light-Duty Vehicles; Request for Comment on Model Year 2021 Greenhouse Gas Emissions Standards (August 21, 2017); EPA–HQ–OAR–2015–0827

On behalf of our millions of members across the country, Environmental Defense Fund together with the California-based NGOs, CEERT (The Center for Energy Efficiency and Renewable Technologies) and the Clean Power Campaign respectfully submit the following comments on the Environmental Protection Agency's *Request for Comment on Reconsideration of the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022–2025 Light-Duty Vehicles; Request for Comment on Model Year 2021 Greenhouse Gas Emissions Standards*.[1]

EDF is a non-partisan, non-governmental environmental organization representing over two million members nationwide. Since 1967, EDF has linked law, policy, science, and economics to create innovative, equitable, and cost-effective solutions to today's most pressing environmental problems. EDF pursues initiatives at the state and national levels designed to protect human health and the environment. Among these initiatives, EDF has worked to reduce climate-

[1] 82 Fed. Reg. 39,551 (Aug. 21, 2017) [hereinafter EPA 2017 Request for Comment].
[2] Pursuant to the judicial review provisions of the Clean Air Act, a court reviewing EPA's GHG emission standards may reverse the action if it is found to be arbitrary, capricious, an abuse of discretion, or otherwise not in accordance

destabilizing and health-harming emissions from the transportation sector and improve vehicle fuel economy.

Based in Sacramento, CEERT is a unique coalition of key environmental organizations and companies devoted to promoting, developing, and providing clean energy options, including clean transportation, energy efficiency, renewable supply-side resources, and demand-side resources. CEERT also pursues the policy goals of fighting climate change, improving air quality and energy independence and security in the electric generation and transportation sectors in California and the West through reduced dependence on fossil fuels and greater efficiency in energy use and increased reliance on renewable resources.

Also based in Sacramento, for over two decades the Clean Power Campaign (CPC) has led the fight for clean energy and worked to give the public interest a seat at every table where important decisions are being made about energy, whether that be with the electrical utilities, fossil-fuel companies, the manufacturers of cars and trucks, construction equipment or others. The CPC fights for stronger laws protecting public health by regulating the emission of climate and toxic air pollution. The CPC also advocate for policies and programs geared toward sustainable, renewable resources that reduce the use of dirty fuels, require greater energy efficiency in appliances, vehicles, and buildings, and to generate more power from clean and renewable resources.

EPA's announcement that it is reconsidering the January 2017 Final Determination is deeply concerning because it ignores the successful track record of fuel economy and greenhouse gas standards, in which health protection, consumer savings and job creation have gone hand in hand. Equally concerning, the review fundamentally misapprehends and misconstrues EPA's proper role, statutory mandate, and expertise—as the agency with core responsibility for protecting the health and welfare of all Americans by reducing harmful pollution. In light of the robust technical record and other data supporting the January 2017 Final Determination, as well EPA's statutory responsibility to protect human health and the environment, the adoption of any standards less stringent than the current standards would be arbitrary and unlawful.[2] Indeed, the extensive empirical record demonstrates that greater reductions are achievable and cost-effective, and that limiting vehicle emissions is vital for public health.

Our comments emphasize that:

[2] Pursuant to the judicial review provisions of the Clean Air Act, a court reviewing EPA's GHG emission standards may reverse the action if it is found to be arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law. 42 U.S.C. § 7607.

- The existing record firmly supports EPA's final determination that the existing MY2022-2025 standards remain "appropriate" under Clean Air Act Section 202(a)(1) and that, if anything, they should be strengthened.
- If EPA reconsiders this determination, it must consider new evidence that further underscores the feasibility and cost-effectiveness of the existing standards.
- EPA may not set aside this determination on the basis of reasoning and factors that subvert EPA's statutory purpose under Section 202 to protect human health and welfare from dangerous pollution.
- It would be arbitrary and capricious and contrary to statute for EPA to set aside its technical expertise and capabilities and defer to the National Highway Transportation Safety Agency, which has a wholly distinct statutory mandate and less relevant expertise.
- EPA must follow proper procedures if it reconsiders its final determination, including those enumerated in the mid-term evaluation regulations.
- The existing standards save consumers money and provide enormous net benefits.
- EPA's existing, rigorous deliberations already covered the additional factors listed in EPA's reconsideration notice and properly concluded that they offered no basis to set aside the existing standards.

I. EPA's Actions Must Be Consistent with Its Unique Clean Air Act Duties to Protect Public Health and Welfare and With Basic Administrative Law Requirements

a. Purpose of Section 202 is to reduce emissions; EPA has authority to project availability of technology with lead time

The purpose of Section 202 of the Clean Air Act is to safeguard public health and welfare by reducing pollutant emissions from motor vehicles. Similarly, the Clean Air Act's purpose is the "reduction or elimination" of pollutants at the source.[3]

Section 202(a)(1) mandates that the EPA Administrator "shall" promulgate "standards applicable to the emission of any air pollutant" from new motor vehicles and engines, which "cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare."[4] Section 202(a)(2) empowers EPA to set emissions standards based on projections of future technology, providing that regulations "shall take effect after such period as the Administrator finds necessary to permit the development and application of the requisite technology."[5]

Congress imposed this mandate in the 1965 CAA amendment, assigning the agency the responsibility to adopt forward-looking motor vehicle emissions standards in light of, as expressed in a House Report, "the fact that current and future research and experience can be expected to provide the basis for improving and refining pollution control programs and standards."[6] The report went on to state that "standards should reflect the best judgment of the technical experts, and there is need to permit such improvements to be made as rapidly as the state of the art permits."[7] The legislative history of the subsequent CAA amendments of 1970 and 1977 further emphasized that Congress "expected [EPA] to press for the development and application of improved technology rather than be limited by that which exists today."[8]

Section 202 delegates to EPA the responsibility to issue motor vehicle emissions standards that can be achieved by technologies that may still be in development at the time of promulgation, but that the agency projects will be available by the model years in which the standards apply.[9]

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[3] Section 101(a)(3).
[4] 42 U.S.C. § 7521(a)(1); *see also Coal. for Responsible Regulation, Inc. v. Envtl. Prot. Agency*, 684 F.3d 102, 126 (D.C. Cir. 2012) ("If EPA makes a finding of endangerment, the Clean Air Act requires the [a]gency to regulate emissions of the deleterious pollutant from new motor vehicles." (quoting *Mass. v. Envtl. Prot. Agency*, 549 U.S. 497, 533 (2007)).
[5] 42 U.S.C. § 7521(a)(2).
[6] H. Rep. No. 89-899, 111 Cong. Rec. 3608, 3616 (1965).
[7] *Id.* at 3,622.
[8] *Natural Res. Def. Council, Inc. v. Envtl. Prot. Agency*, 655 F.2d 318, 328 (D.C. Cir. 1981) (quoting S. Rep. No. 1196, 91st Cong., 2d Sess. 24 (1970); H. Rep. No. 294, 95th Cong., 1st Sess. 273 (1977)).
[9] *See* 42 U.S.C. § 7521(a); *Natural Res. Def. Council, Inc.*, 655 F.2d at 328.

Emissions control technologies that automakers have developed since 2012, and are already utilizing today, confirm that EPA's projections were correct and even conservative: the technologies to achieve the MY2022-2025 standards are currently available, and at lower cost than was projected in 2012.[10] As discussed in detail below, additional technologies are now available that will further decrease costs and reduce pollution in the MY2022-2025 timeframe. Thus, the light-duty GHG emissions standards first promulgated in 2012 and reaffirmed by the Midterm Evaluation and January 2017 Final Determination are unquestionably "appropriate" within the meaning of section 202(a)(2) and 40 C.F.R. section 1818-12(h).

b. EPA Has a Mandatory Legal Duty to Exercise its Own Expertise and Judgment and Reach an Independent Decision

EPA has a legal obligation to exercise its own technical and scientific expertise in developing an empirical and factual basis for determining the appropriate emission standards under section 202(a). Based on this empirical and factual record, EPA must exercise its independent judgment in determining the appropriate emissions standard under section 202(a)(1).

This duty is mandated by section 202(a)(1) of the Clean Air Act, which states: "*The Administrator shall* by regulation prescribe. . . standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines, which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare" (emphasis added). Use of the verb "shall" vests a mandatory, non-discretionary duty in EPA to act, a duty that is explicitly entrusted to EPA's Administrator.[11]

EPA is an administrative agency that is separate and apart from NHTSA. EPA has separate and different statutory authority, obligations, and mission. EPA's statutory obligation under section 202 of the Clean Air Act is to protect the public health and welfare, separate from and unchanged by NHTSA's statutory obligations. Put simply, NHTSA is not charged with protecting public health and the environment; its mandate does not stem from a finding that greenhouse gas emissions endanger the public health and welfare, and vehicular emissions of that air pollutant contribute to the endangerment. As the Supreme Court stated: "that DOT sets mileage standards in no way licenses EPA to shirk its environmental responsibilities. EPA has been charged with

[10] ARB, "CARB finds vehicle standards are achievable and cost-effective" (March 24, 2017), *available at* https://www.arb.ca.gov/newsrel/newsrelease.php?id=908. Implementation of the MY2012-16 standards has resulted in the overwhelming majority of automakers over complying in past years, and achieving the standards at lower cost than expected. As discussed at length below, updated data and modeling on the MY2022-2025 standards confirms EPA and ARB's conclusions that more options, at lower cost, are available to achieve the targets than anticipated in EPA's final rule.

[11] *Coal. for Responsible Regulation v. Envtl. Prot. Agency,* 684 F. 3d 102, 126 (D.C. Cir. 2012).

protecting the public's 'health' and 'welfare,' a statutory obligation wholly independent of DOT's mandate to promote energy efficiency."[12]

Moreover, "[j]ust as EPA lacks authority to refuse to regulate on the grounds of NHTSA's regulatory authority, EPA cannot defer regulation on that basis"[13] and "[EPA is not] required to treat NHTSA's . . . regulations as establishing the baseline for the [section 202(a) standards]."[14] Indeed, although NHTSA is obligated by statute to consider the EPA standards in determining what standards are maximum feasible,[15] EPA is under no such obligation.[16] Moreover, NHTSA has no authority whatsoever in the MTE process, which is exclusive to EPA.[17] EPA must exercise its independent authority separate and apart from NHTSA's exercise of its authority.

i. EPA has an accomplished history of relevant expertise

In carrying out this mandatory duty, EPA must exercise its own independent engineering and scientific judgment and expertise—which surpasses any comparable NHTSA capabilities in relevant areas. EPA is the federal agency with the most in-house automotive technical expertise, located at its vehicle laboratory. EPA's Office of Transportation and Air Quality has a long history of developing leading vehicular emission standards. Findings from an independent review by the Government Accounting Office underscore EPA's comparative technical advantage:

> The difference in the extent of new research that NHTSA and EPA conducted for this rulemaking likely results from differences in resources available to the agencies in the recent past. As we mentioned previously, from fiscal years 1996 to 2001—about 6 years—NHTSA was prohibited from using appropriated funds to change CAFE standards. According to NHTSA, the agency lost staff with expertise in this area as a result and did not begin to hire additional automotive engineers until summer 2009. By comparison, EPA has been able to develop and maintain automotive engineering

[12] *Mass. v. Envtl. Prot. Agency*, 549 U.S. 497, 532 (2007) (internal citations omitted).
[13] *Coal. for Responsible Regulation v. Envtl. Prot. Agency*, 684 F. 3d at 127.
[14] *Id.* (noting further that "the [section 202(a) standards] provid[e] benefits above and beyond those resulting from NHTSA's fuel economy standards").
[15] 49 U.S.C. § 32902(f).
[16] *Coal. for Responsible Regulation v. Envtl. Prot. Agency*, 684 F. 3d at 127.
[17] 40 C.F.R. § 86.1818-12(h) ("Mid-term evaluation of standards. No later than April 1, 2018, the Administrator shall determine whether the standards established in paragraph (c) of this section for the 2022 through 2025 model years are appropriate under section 202(a) of the Clean Air Act, in light of the record then before the Administrator . . . If the Administrator determines they are not appropriate, the Administrator shall initiate a rulemaking to revise the standards, to be either more or less stringent as appropriate."). In this regard, it is troubling that the notice announcing reconsideration of the Final Determination is a joint notice with NHTSA, when NHTSA is without authority in issues involving the MTE. The Notice fails to indicate that NHTSA's participation in this comment period is in any way an exercise of its separate authority, such as a NHTSA rulemaking to adopt binding CAFE standards for MY2022-2025.

> expertise. This expertise has proved helpful in setting GHG emissions standards for automobiles. For example, EPA has been home to the National Vehicle and Fuel Emissions Laboratory since 1971, and in the early 1990s, it expanded its activities to conduct research and development of technologies used to reduce emissions, which are often marketed and licensed to the automobile industry. Although NHTSA brings safety expertise to CAFE standards, which has been a concern with raising CAFE standards in the past, the agency's primary mission and expertise is in vehicle safety, not vehicle power train design and the impact of vehicle emissions on the environment. Thus **NHTSA cannot be expected to have the same level of in-house expertise related to vehicle power train design and environmental issues as EPA.**[18]

EPA has a long history of how it develops a strong technical and scientific basis for setting emissions standards under section 202(a). This includes extensive technical and engineering work conducted directly by EPA, as well as detailed investigations conducted by national labs, academic researchers, industry experts and contractors under EPA's oversight. As just one example of this body of expertise, Appendix D includes a review of all of the peer-reviewed publications relevant to the mid-term evaluation that were authored by EPA or NHTSA.[19] This review demonstrates that EPA is responsible for a substantially greater number of recent peer-reviewed publications as compared to NHTSA. For example, reports authored by EPA staff include modeling and validation of several relevant component technologies, examination of opportunities available with improvements to existing engines, simulations using EPA's ALPHA model, and other analyses that directly bolster EPA's technical understanding relevant to this rulemaking. NHTSA's body of work, by comparison, does not demonstrate the same level of detailed examinations of key rulemaking technical considerations.

EPA has comprehensively and diligently exercised its expertise in this manner in the original rulemaking and in the Midterm Evaluation to date and must continue to do so. EPA staff performed the technical analyses that led to the current standards and which informs the Midterm Evaluation.[20] Ten thousand pages of analysis and multiple peer-reviewed studies either authored by EPA or by contractors working under close supervision of EPA staff underlie the Midterm Evaluation Final Determination.[21] EPA benchmarked more than 20 of the most advanced

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[18] Government Accounting Office, Vehicle Fuel Economy: NHTSA's and EPA's Partnership for Setting Fuel Economy and Greenhouse Gas Emission Standards Improved Analysis and Should be Maintained, GAO 10-336, 23-24 (2010) (emphasis added), *available at* http://www.gao.gov/assets/310/301194.pdf.

[19] The compilation reflects peer-reviewed publications that were included in the Draft Technical Assessment Report and its appendices, Proposed Determination and its Technical Support Document, Final Determination, and EPA and NHTSA's webpages listing peer-review publications relevant to the midterm evaluation.

[20] *See generally* Draft Technical Assistance Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025 (July 27, 2016) at 2-2 to 2-3 [hereinafter "Draft TAR"].

[21] *Id.*

vehicles, engines, and transmissions as part of that analysis.[22] These data provided inputs and validation for EPA's vehicle simulation model, the Advanced Light-Duty Powertrain and Hybrid Analysis model (ALPHA).[23] EPA's cost analysis is informed by state-of-the-art cost teardown studies (conducted with the engineering firm FEV).[24] In assessing issues relating to consumer impacts and technology acceptance, EPA initiated research, including a project exploring automotive reviews of newly-introduced fuel economy technologies, a comprehensive review of the academic literature on consumer willingness to pay for vehicle attributes, and endeavored (unsuccessfully — like all others' efforts) to develop a reliable consumer choice model capable of making rational and reasonable quantitative predictions.[25] EPA also developed sophisticated modeling tools, both ALPHA for full vehicle simulation, and improvements to its Optimization Model for reducing Emissions of Greenhouse gases from Automobiles (OMEGA).[26]

Relatedly, the independent GAO report (noted above) examined EPA and NHTSA's collaboration in the course of issuing MY2012 to 2016 standards and found the same trend of greater expertise and contributions from EPA. This independent report documented and underscored EPA's greater contributions in the context of this rulemaking—noting that, "EPA contributed research in time to provide analysis for the proposed rule. It also contributed funding to a greater degree [as compared to NHTSA]. . . . EPA conducted or contracted for three peer-reviewed studies to support the rulemaking and the modeling efforts," research that "provided the analysis of both CAFE and GHG standards with updated information and data."[27] In contrast, "[a]lthough NHTSA contributed research to the rulemaking process, it faced challenges in doing so."[28]

EPA's duty is to continue to use its own technical and scientific expertise in developing GHG standards under the CAA. EPA may not defer to, or *de facto* delegate the exercise of its technical or other expertise to, another agency such as NHTSA. EPA is the "agency charged by Congress with the initial responsibility of making, evaluating, and acting upon … facts."[29] EPA must actively exercise its technical and scientific expertise and independent judgment to satisfy that obligation. Anything less is an unlawful abdication of EPA's statutory responsibilities.

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[22] Draft TAR at 2-2.
[23] Draft TAR at 2-3.
[24] *Id.*
[25] *Id.*
[26] *Id.*
[27] Government Accounting Office, Vehicle Fuel Economy: NHTSA's and EPA's Partnership for Setting Fuel Economy and Greenhouse Gas Emission Standards Improved Analysis and Should be Maintained, GAO 10-336, 23 (2010), *available at* http://www.gao.gov/assets/310/301194.pdf.
[28] *Id.* at 21.
[29] *Deutsch v. United States Atomic Energy Commission*, 401 F.2d 404, 407 (D.C. Cir. 1968).

EPA's exercise of its independent judgment and technical and scientific expertise must not only encompass and rationally consider all of the substantial existing record, and all of EPA's past analysis and studies, but also all of the tools used in that analysis. In this regard, consistent with recommendations of the National Academy of Sciences (2015)[30], the Midterm Evaluation made extensive use of sophisticated analytic tools and methodologies. These include use of EPA's vehicle simulation model ALPHA to simulate the effectiveness of individual technologies and technologies in combination, and EPA vehicle teardown studies to estimate technology cost. EPA has also used its peer-reviewed OMEGA model to make reasonable estimates of how manufacturers could add technologies to vehicles in order to meet a fleet-wide CO_2 standard. EPA should rely on its own technical and scientific expertise and the extensive record to date. At the least, any decision not to use these well-documented, peer-reviewed, NAS-recommended analytic tools and their inputs would be arbitrary and capricious given the advantages of the OMEGA model and EPA's work with that model in fulfilling EPA's statutory obligations and the capacity and experience of EPA staff in this arena.[31]

EPA clearly has the authority to evaluate, consider, and if appropriate rely on technical and scientific information developed by outside parties or other agencies, such as NHTSA or DOE. However, EPA is required first and foremost to exercise its own expertise and knowledge, and not defer or delegate this exercise of expertise to other parties. Similarly, EPA clearly can coordinate and work with NHTSA, where the goal of such coordination and work is to further EPA's independent exercise of its own expertise, judgment, and statutory authority. EPA has no authority to defer or avoid exercising its own technical and scientific expertise and judgment. Section 202(a)(1) and (2), clearly delegate to EPA, and EPA alone, the authority and obligation to set federal standards to address air pollution from vehicles. EPA's decisions here must be justified under section 202(a) of the Clean Air Act, not principles outside of it.[32]

Thus, in the MTE reconsideration and any subsequent GHG rulemaking, EPA must continue to exercise its own technical and scientific expertise in developing a factual basis for determining the appropriate emission standards under section 202(a), and on this factual basis, EPA must exercise its independent judgment and expertise in determining the appropriate emissions standards under the Clean Air Act, as it has to date.

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[30] National Research Council, "Cost, Effectiveness, and Deployment of Fuel Economy Technologies for Light-Duty Vehicles," Washington D.C: The National Academies Press, https://doi.org/10.17226/21744.

[31] *See U.S. Telecom Ass'n v. FCC*, 359 F.3d 554, 565 (D.C. Cir. 2004).

[32] *Mass. v. Envtl. Prot. Agency*, 549 U.S. at 532 (decisions under section 202(a)(1) cannot be based on reasons divorced from statutory text); see also *Ctr. For Biological Diversity v. NHTSA*, 538 F.3d 1172 (9th Cir. 2008) (agencies may exercise discretion when weighing statutorily prescribed factors only "as long as [the agency]'s balancing does not undermine the fundamental purpose" of the statute). As noted above, although NHTSA is obligated to consider EPA GHG standards in determining what CAFE standards are maximum feasible, there is no parallel obligation for EPA to consider CAFE standards.

c. CAFE (Volpe) Modeling Approach is not appropriate for EPA use and does not fulfill EPA's duty to exercise its independent judgement and expertise

The Draft TAR indicated that even though the agencies worked collaboratively "in an array of areas" during the development of the report, the "EPA GHG and NHTSA CAFE assessments were done independently."[33] The Draft TAR further notes that, "independent and parallel analysis can provide complementary results."[34] This was also the case for the Phase 1 and Phase 2 GHG and fuel economy rulemakings. Each agency utilized different modeling techniques in their respective analysis and in some cases different data sources. In both of these rules and in the Draft TAR, both Agencies have consistently relied on their own modeling approaches and have attempted to align inputs. It would, however, be arbitrary for EPA to abandon the model designed for the purpose of fulfilling EPA's statutory obligations under Section 202 and the agency staff's many years of expertise in emission-reducing technologies and with the OMEGA model in favor of a model designed for a different purpose and with which the EPA staff have little expertise. To do so would constitute a failure to exercise EPA's independent judgment and expertise as required by the statute and Congress's delegation of authority to EPA to address air pollution from vehicles.

The OMEGA model was originally developed as part of EPA's Phase 1 (MY2012-2016) GHG rulemaking and was used to develop, test and justify its choice of standards finalized in that rule. EPA has continued to refine and improve the OMEGA model as it developed the Phase 2 (MY2017-2025) GHG rulemaking and conducted the Midterm Evaluation of the MY2022-2025 standards. The OMEGA model was specifically designed as a tool to aid EPA in carrying out its statutory obligations under the Clean Air Act to set GHG standards by determining the cost of compliance and the most cost effective technology pathways to achieve potential GHG standards.

On the other hand, the Compliance and Effects Model (commonly referred to as the "CAFE (Volpe) model") was developed to help NHTSA carrying out its statutory obligations under the Energy Policy and Conservation Act (EPCA). NHTSA indicated in the MY2012-2016 CAFE rulemaking that the CAFE model was "developed specifically to support NHTSA's CAFE rulemakings" and incorporates a number of features and "engineering constraints" that are not appropriate for use by EPA in setting GHG standards and more specifically in its effort to reconsider the Final Determination for the Midterm Evaluation.[35]

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[33] Draft TAR at ES-6.
[34] Draft TAR at ES-6.
[35] Phase 1 Light-Duty Vehicle GHG and CAFE Standards Final Rule, 75 Fed. Reg. 25,324, 25,597, 25,572-81 (May 7, 2010).

Important statutory constraints that are built into the CAFE modeling approach that are either inconsistent with or irrelevant for EPA's analysis include:

a. Standards can only be set for 5 years in the future
b. Cannot consider electric vehicles or any other alternative fuel vehicles in the standard-setting process
c. Limits on credit transfers between an automaker's car and truck fleets
d. Must allow fines in lieu of compliance, and assumes that future automaker use of fines in the future will be the same as in the past
e. Cannot consider off-cycle credits for technologies that improve real world fuel economy (and greenhouse gas emission reductions), but which are not reflected in the city and highway testing
f. Cannot address non-CO_2 greenhouse gases such as CH_4, N_2O, and HFCs
g. Must base standards on city and highway tests only
h. Considers a gallon of gasoline to be equivalent to a gallon of diesel, even though diesel contains more energy and carbon per gallon

These constraints in the model appropriately reflect legal constraints specific to NHTSA.[36] However, they are inappropriate in EPA's section 202(a)(1) and (2) determinations, as the Clean Air Act does not reflect any of these constraints nor assumptions, such as the possibility of paying fines in lieu of compliance or equivalence of gasoline and diesel. Meanwhile, EPA's modeling framework was tailored to support Section 202 rulemaking under the Clean Air Act and can therefore provide a credible and science-based projection of the most cost-effective pathways for reducing greenhouse gas emissions, consistent with EPA's statutory authority as articulated in Section 202.

There is also a key overarching difference in the architecture of the models where the CAFE modeling approach appropriately matches NHTSA's statutory authority – but is inapt for EPA. The CAFE model attempts to simulate for each manufacturer, by year, their refresh and redesign cadence across their vehicle platforms and then predict a manufacturer's technology deployment decision- making process for each platform.[37] But under the Clean Air Act, EPA is not required to demonstrate that standards are set at the maximum feasible level year-by-year, as EPCA requires for NHTSA. The EPCA requirements drive the design of the CAFE model, in that a

[36] *See* 49 U.S.C. § 32902(b)(3)(B) (standards for a maximum of five model years); 49 U.S.C. § 32902(h)(1) (cannot consider electrified or alternative fuel vehicles in CAFE standard-setting); 49 U.S.C. § 32902(h)(3) (cannot consider trading between car and truck fleets in CAFE standard setting); 49 U.S.C. § 32904(c) (city and highway test mandated); 49 U.S.C. § 32912(b) (fines in lieu of compliance).
[37] *See* 49 U.S.C. § 32902(b)(2); 2017 and Later Model Year Light-Duty Vehicle GHG and CAFE Standards, 77 Fed. Reg. 62,624, 63,008, n. 1112 (Oct. 15, 2012) (EPCA requires that NHTSA make a year-by-year determination of the appropriate level of stringency and then set the standard at that level; NHTSA has "long interpreted this statutory language to require year-by-year assessment of manufacturer capabilities").

year-by-year analysis is performed in order to demonstrate that NHTSA is meeting its EPCA obligations.

This requirement drives NHTSA to attempt to achieve highly specific year-by-year modeling estimates. Table 3 below is an excerpt from the Draft TAR and describes the type and depth of information needed for the CAFE model. Although NHTSA attempts to achieve this year-by-year specificity by populating its model with data derived from the manufacturers, it should be recognized that there are serious potential errors with this approach.

Table 3
Information Needs for CAFE Model[38]

Vehicle models offered for sale – their current (i.e., MY2015) and future production volumes, prices, fuel saving technology content (relative to the set of technologies described in Table 13.3 and Table 13.4 and other attributes (curb weight, drive type, assignment to technology class and regulatory class).
Production constraints – product cadence of vehicle models (i.e., schedule of model redesigns and "freshening"), vehicle platform membership, degree of engine and/or transmission sharing (for each model variant) with other vehicles in the fleet.
Compliance constraints and flexibilities – historical preference for full compliance or fine payment, willingness to apply additional cost-effective fuel saving technology in excess of CAFE requirements, projected applicable flexible fuel credits, and current CAFE credit balance in first model year of simulation.

First and foremost, the data that NHTSA needs to input into its model is sensitive confidential business information that is not transparent and cannot be independently verified; accordingly, there is no way to confirm that manufacturers "open their books" and fully disclose this sensitive business information to NHTSA. Furthermore, manufacturers have an incentive to provide conservative data to NHTSA, which would bias the CAFE model's cost estimates on the high side. The OMEGA model avoids these concerns entirely by operating on a five-year cycle and assuming that platforms will undergo a major redesign cycle at some point within those 5 years—thereby avoiding the need to rely on confidential business information and to forecast engineering constraints on manufacturer redesign cycles and the deployment of new technologies at artificially high levels of precision. Meanwhile, the OMEGA model's focus on direct technological inputs and costs – as opposed to industry self-reported data – ensures the model more accurately characterizes the true feasibility and cost effectiveness of deploying greenhouse gas reducing technologies.

The CAFE modeling approach suffers from other weaknesses:

[38] Draft TAR at 13-48 to 13-49.

- The National Academy of Sciences recommends the use of full vehicle simulation modeling as the best approach to project the overall technology GHG reducing effectiveness when combining multiple technologies. Over time, EPA has evolved to the use of full vehicle simulation modeling. The CAFE Model still relies only on partial simulation modeling, also relying on "synergies look up tables" which are based on a set of simplistic assumptions.[39]
- The single most important data inputs to both the OMEGA and CAFE models are engine and transmission maps. EPA generates state-of-the-art engine and transmission maps from benchmarking some of the most efficient vehicles in the world at its National Vehicle and Fuel Emissions Laboratory in Ann Arbor, MI. NHTSA does not operate a laboratory (in fact, the data for NHTSA's CAFE compliance is primarily generated at EPA/NVFEL)[40] and has to rely on the literature for its engine and transmission maps. In practice, this has led to the use of outdated maps in the CAFE Model.
- The National Academy of Sciences recommends the use of cost "tear down" studies as the best way to project the cost of future technologies.[41] EPA has funded many cost tear down studies. NHTSA has relied on literature that is not based on tear down studies.

There are also issues of proper notice relating to use of analytic tools here. Should EPA abandon its own modeling tools and use the NHTSA Volpe model as its predictive tool, or rely on the Autonomie model, then section 307(d)(3) of the Act requires EPA to provide adequate notice on all aspects of the model (including its methodology and algorithms, and choice of inputs) such that the model results are replicable by a third party. This degree of requisite transparency already exists for the OMEGA model, which EPA has made publicly available on its website and fully described its methodology and algorithms in the federal register.[42] In contrast, the adequacy and transparency of NHTSA's documentation to date is insufficient to allow effective replication, and the Autonomie model is not even publicly available (as documented in the comments of the American Council for an Energy Efficient Economy (ACEEE).[43]

The inescapable fact is that both models were developed to allow each Agency to carry out its obligations under their respective statutes. This is, of course, appropriate, but the upshot is that

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[39] "Cost, Effectiveness, and Deployment of Fuel Economy Technologies for Light-Duty Vehicles," National Research Council, 2015.
[40] This reflects the statutory requirement that EPA, not NHTSA, measure and verify compliance with CAFE standards. 49 U.S.C. § 32904(a).
[41] "Cost, Effectiveness, and Deployment of Fuel Economy Technologies for Light-Duty Vehicles," National Research Council, 2015.
[43] *See* ACEEE Comments to the Environmental Protection Agency and the National Highway Traffic Safety Administration on the Technical Assessment Report; Docket ID No. EPA-HQ-OAR- 2015-0827 and/or Docket No. NHTSA-2016-0068, *available at* http://aceee.org/sites/default/files/comments-on-tar-epa-092616.pdf.
[43] *See* ACEEE Comments to the Environmental Protection Agency and the National Highway Traffic Safety Administration on the Technical Assessment Report; Docket ID No. EPA-HQ-OAR- 2015-0827 and/or Docket No. NHTSA-2016-0068, *available at* http://aceee.org/sites/default/files/comments-on-tar-epa-092616.pdf.

the Volpe model approach does not align with EPA's statutory authority. EPA's use of the CAFE modeling approach would thus be inappropriate, and would call into question EPA's exercise of its own independent judgment and expertise. Moreover, to the extent EPA would base any conclusions on such a constrained model, the determination would be arbitrary and illegal because EPA would be basing a conclusion on factors — non-Clean Air Act constraints — which are outside EPA's Clean Air Act mandate.

d. The context of this rulemaking heightens EPA's duty to explain any change in course.

In any rulemaking, an agency must support all of its decisions by reasoned explanation, comprehensively examining the relevant data and clearly articulating a well-reasoned and complete explanation for its action.[44] Where an agency reverses its position, its decision must also be rigorously supported,[45] including a "rational connection between the facts found and the choice made."[46] As the basis for reversing course, the agencies may not offer a justification "that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise."[47]

In particular, the Supreme Court has emphasized that more detailed explanations may be necessary in the case of rules that involve "serious reliance interests."[48] In this case, automakers and suppliers have themselves underscored the lead-times necessary in this context. Commenters have expressed serious concerns about jeopardizing reasonable reliance interests in investments in advanced technology and the supporting research, development, and hiring.[49] Moreover, local air quality jurisdictions and regulations across the country may rely on federal vehicle standards

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[44] *See Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43-44 (1983).
[45] *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515 (2009); *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29 (1983).
[46] *State Farm*, 463 U.S. at 43 (citation omitted).
[47] *Id.*
[48] *FCC*, 556 U.S. at 515; *see also Encino Motorcars, LLC v. Navarro*, 136 S. Ct. 2117, 2126 (2016); *Nalco Co. v. EPA*, 786 F. Supp. 2d 177, 186 (D.C.C. 2011).
[49] *See* Public Testimony of Manufacturers Emission Control Association and Motor & Equipment Manufacturers Association (September 6, 2017), *available at* *https://www.mema.org/sites/default/files/resource/MEMA%20Testimony%20EPA%20MTE%20Sept%206%202017.pdf*; Abby Smith, "Automakers, Parts Suppliers at Odds Over EPA Emissions Standards", Bloomberg News (Sept. 6, 2017), *available at* https://www.bna.com/automakers-parts-suppliers-n73014464219/(quoting a supplier trade association representative noting that members' employment plans "have been contingent on compliance with the new" EPA and NHTSA standards); Aluminum Association press release, "Aluminum Industry Requests Regulatory Certainty from EPA Regulators During Public Hearing" (September 6, 2017), *available at* *http://www.aluminum.org/news/aluminum-industry-requests-regulatory-certainty-epa-regulators-during-public-hearing* (quoting company Chairman Ganesh Panneer noting "Aluminum is a key enabler in helping automakers meet national fuel efficiency and emissions goals," and "aluminum companies need predictability and consistency in the regulatory conditions under which they operate.").

as part of complex, multi-step deliberations and planning to achieve air quality goals, such as nitrogen oxides reductions in California.[50] EPA must take heed of the Supreme Court's exhortation that under such circumstances, agencies must provide "a more detailed justification" than what is required for a new regulation created on a blank slate.[51]

If EPA were to make new or different factual findings to support a new policy, where those findings contradict the prior record, it must also provide "a more detailed justification" in demonstrating that the change is reasoned.[52] An agency may not "disregard contrary or inconvenient factual determinations that it made in the past, any more than it can ignore inconvenient facts when it writes on a blank slate."[53] In particular, more detailed explanations would be necessary here if a new final determination relies on "factual findings that contradict those which underlay. . . prior policy."[54] No judicial deference is provided to an agency's purported exercise of its technical expertise when that explanation lacks coherence.[55]

e. Any Revision of the January 2017 Final Determination Would Have to Comply with the Procedural and Substantive Regulatory Standards Governing the Midterm Evaluation.

EPA has expressed its intention to "reconsider" its Final Determination of the Midterm Evaluation of the 2022-25 emission standards. But EPA has not proposed to repeal the regulatory framework governing the Mid-Term Evaluation itself. And that framework imposes

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[50] *See* J. Jared Snyder, NYS Department of Environmental Conservation Comments on Midterm Evaluation of MY2022-2025 Light-duty Vehicle Greenhouse Gas Emissions Standards, *available at* https://www.regulations.gov/document?D=EPA-HQ-OAR-2015-0827-6197 ("In New York, DEC is tasked with mitigating the effects of climate change and has the obligation to regulate and mitigate GHG emissions from mobile sources to safeguard the health of State residents and protect the State's environment. . . Implementation of stringent but achievable mobile source emissions standards is essential to protect human health and the environment."); Northeast States for Coordinated Air Use Management, Comments on Midterm Evaluation of MY2022-2025 Light-duty Vehicle Greenhouse Gas Emissions Standards, *available at* https://www.regulations.gov/document?D=EPA-HQ-OAR-2015-0827-6168 ("Given the serious challenges our states face in meeting their medium-and long-term GHG reduction goals, and considering that technologies are available today to provide even greater improvements than called for in the regulation, we will continue to look for opportunities to encourage the deployment of ever more efficient vehicles.").

[51] *FCC*, 556 U.S. at 515-16.

[52] *FCC*, 556 U.S. at 515 (When an agency's "new policy rests upon factual findings that contradict those which underlay its prior policy," the agency must "provide a more detailed justification than what would suffice for a new policy created on a blank slate.").

[53] *Id.* at 537 (Kennedy, J. concurring).

[54] *Id.* at 515.

[55] *Tripoli Rocketry Ass'n v. BATFE,* 437 F. 3d 75, 77 (D.C. Cir. 2006) ("The problem in this case is that ATFE's explanation for its determination that APCP deflagrates lacks any coherence. We therefore owe no deference to ATFE's purported expertise because we cannot discern it."); *Coburn v. McHugh*, 679 F. 3d 924, 926, 934 (D.C. Cir. 2012) ("Because the ABCMR's decisions are largely incomprehensible on these points, they are unworthy of any deference."); *see also Haselwander v. McHugh*, 774 F. 3d 990, 996 (D.C. Cir. 2014); *Global Tel*Link v. FCC,* 859 F.3d 39, 56 (D.C. Cir. 2017).

significant constraints upon EPA's reconsideration – constraints that must be honored if the reconsideration is to be lawful.

First, if EPA does intend to issue a revised Final Determination that differs from the one issued in January 2017, it must first issue a Proposed Determination and afford the public a meaningful opportunity to comment on it. This was, of course, the process that EPA properly followed in 2016 – issuing a Proposed Determination on November 30, 2016, and allowing a 30-day period for public comment. The Final Determination is an important agency decision that must conform to specified statutory and regulatory factors – basic administrative law principles of fair notice and public participation would in any event require providing the public an opportunity for input on EPA's proposed decision. The need for publication of a proposal with meaningful opportunity for public comment is all the greater if EPA is going to introduce new policy factors and rely upon new information. At the least, the process afforded previously must be provided this time around.

Second, and similarly, EPA must allow for public comment on any proposed technical findings and determinations that EPA may seek to rely upon in a revised Final Determination that are additional to or different from those contained in the Draft TAR (which was, of course, was published with opportunity for public comment). The regulations governing the Midterm Evaluation process contemplate and require the prior publication by EPA of the proposed technical basis for EPA's determination; they require that a TAR be published for public review and comment in advance of the public determination. Under those regulations, a draft TAR must be issued months before any final determination.[56] These requirements make clear that with respect to any "issues relevant to the standard for the 2022 through 2025 model years,"[57] EPA must publish any technical findings in proposed form and allow for public input on them before relying upon them to support a Final Determination. For EPA to rely upon technical findings, determinations or judgments that it had not previously published and invited commented on would be starkly inconsistent with the process contemplated in the Midterm Evaluation regulations that EPA purports to be following.

Therefore, if EPA intends to rely upon any technical determinations additional to or different from those in the Draft TAR (one which, notably, EPA has expressly not reopened for comment),[58] it must publish any such determination in proposed form and allow public comment on it prior to relying on it as support for any revised Final Determination. Any

[56] 40 C.F.R. § 86.1818–12(h)(2)(ii) ("No later than November 15, 2017, the Administrator shall issue a draft Technical Assessment Report addressing issues relevant to the standards for the 2022 through 2025 model years."). EPA is required to invite consider public comment on that draft. 40 C.F.R. § 86.1818–12(h)(2)(ii).
[57] 40 C.F.R. § 86.1818–12(h)(2)(ii).
[58] 82 Fed. Reg. at 38,553.

shortcutting of this proposal-and-public-comment process would be an unlawful departure from the process established in the regulations.

Finally, the Midterm Evaluation was never intended to be an opportunity to revise standards that are well supported by the record and consistent with the statute. The regulations establishing of the Midterm Evaluation establish a procedure whereby EPA may change the MY2022-25 standards that were developed in the comprehensive, multi-year rulemaking on the books only if the agency determines that those standards are no longer "appropriate under section 202(a) of the Clean Air Act, in light of the record before the Administrator."[59] The regulations did not call for EPA to commence a rulemaking *de novo*, as if the existing standards and records did not exist; instead, they call for a change in the standards only if there is some reason why the existing standards are no longer "appropriate" under the statute. This means not just that, in order to determine that a change in the established regulatory is warranted, EPA must clearly identify how the existing standards are not appropriate under the statute.

As we emphasize throughout in these comments, on the record before it, EPA could not reasonably determine that the existing standards are *not* "appropriate under section 202(a) of the Clean Air Act, in light of the record before the Administrator," such that the standards may be weakened. Indeed, it is a measure of EPA's own recognition of the thoroughness of the process it has already completed that EPA expressly declines to reopen the Draft TAR for public comment.[60] On the record before EPA (including the unchallenged TAR), there is no basis for finding either that the 2022-25 standards are in any way inconsistent with the Act or unsupported by the record. The only conceivable change that could be justified now is to *strengthen* the standards, based upon evidence that greater emissions reductions are readily available at modest cost, and that the underlying environmental hazards are ever more grave. If EPA follows the Midterm Evaluation standards and procedures that were developed in 2012 with broad support of stakeholders, it cannot weaken these standards.

II. The existing record overwhelmingly supports the conclusion that the current standards are achievable and appropriate; even more rigorous standards are feasible; and, if anything, the MY2022-2025 standards should be strengthened.

In 2010, EPA, NHTSA, and the California Air Resources Board (CARB) finalized the first-ever integrated GHG and fuel economy standards for light-duty vehicles, and in 2012, these same agencies jointly released the historic Phase 2 program that set tailpipe GHG emissions standards for light-duty vehicles that EPA estimated at the time would in effect double the fleet average fuel economy of passenger cars and trucks by 2025. The combined program is estimated to cut 6

[59] 40 C.F.R. § 86.1818–12 (h).
[60] 82 Fed. Reg. at 38553/col. 1.

billion metric tons of climate pollution over the lifetime of the vehicles sold in MYs 2012-2025 – more than the total amount of carbon dioxide emitted by the United States in 2010.[61] As a consequence, and besides yielding other benefits, the National Program is projected to save families over a trillion dollars in fuel costs and reduce America's dependence on oil by more than 2 million barrels per day in 2025.[62] At the time of the final rule, the State of California and thirteen auto companies representing over 90 percent of U.S. vehicle sales announced support for the program.[63] The program also received strong support from a broad base of stakeholders that included environmental and consumer groups, the United Automobile Workers, veterans' groups, state and local governments, and nearly 300,000 private citizens.[64]

In its October 15, 2012 final rule, EPA committed to conduct a midterm evaluation (MTE) of the MY2022-2025 light-duty standards.[65] The MTE's purpose was to evaluate the MY2022-2025 standards in light of subsequent technological developments reflected in the current record before the Agency. EPA committed "to make a final decision, by April 1, 2018" to affirm or adjust the standards as appropriate.[66] In July 2016, EPA, together with NHTSA and California's Air Resources Board (CARB), issued a Draft Technical Assessment Report (TAR) as the first step in EPA's MTE process.[67] As stated in the 2012 final rule, the Draft TAR was intended to be the primary basis for EPA's appropriateness determination, and to inform NHTSA's rulemaking to finalize MY2022-2025 standards. Subsequent to issuing the Draft TAR, EPA issued a Proposed Determination for comment as part of the Midterm Evaluation of the MY2022-2025 standards, as required under 40 C.F.R. § 86.1818-12(h).[68] On January 12, 2017, EPA issued an adjudicatory Final Determination that found that the MY2022-2025 light-duty GHG standards are "appropriate under section 202(a)(1) of the Clean Air Act."[69] This adjudicatory Final

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[61] "EPA and NHTSA Set Standards to Reduce Greenhouse Gases and Improve Fuel Economy for Model Years 2017-2025 Cars and Light Trucks" at 3 (Aug. 2012), EPA-420-F-12-051, *available at* https://nepis.epa.gov/Exe/ZyPDF.cgi/P100EZ7C.PDF?Dockey=P100EZ7C.PDF [hereinafter EPA Regulatory Announcement].
[62] *Id.*
[63] *Id.* at 2.
[64] *Id.*
[65] 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards; Final Rule, 77 Fed. Reg. 62,624, 62,652 (Oct. 15, 2012) [hereinafter 2012 Final Rule]; 40 CFR section 86.1818-12 (h).
[66] 2012 Final Rule, 77 Fed. Reg. at 62,652.
[67] EPA, NHTSA, & California Air Resources Board, Draft Technical Assessment Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025, at ES-2 (July 2016) [hereinafter Draft TAR].
[68] Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation at ES-1 (Nov. 2016) [hereinafter Proposed Determination]; *see also* Notice of Availability for Proposed Determination, 81 Fed. Reg. 87,927 (Dec. 6, 2016); 2012 Final Rule, 77 Fed. Reg. 62,624.
[69] EPA, Final Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation (Jan. 2017) [hereinafter Final Determination]; *see also* Regulations for Emissions from Vehicles and Engines, The Midterm Evaluation Process, *available at*

Determination concluded EPA's Midterm Evaluation of the standards as required in the regulations.

After completing the MTE process, which included multiple opportunities for comment, and notwithstanding the compelling record supporting the reaffirmation of the MY2022-2025 standards, EPA announced in March 2017 that it was going to reconsider the Final Determination of the Midterm Evaluation.[70] This action was in response to pressure the auto industry brought to bear on the White House and EPA's Administrator Scott Pruitt. In a February 10, 2017 letter, the CEOs from 16 auto companies urged President Trump to "reinstate" the Midterm review of the GHG rules through MY 2025 because they believed the previous administration "truncated the process for the Midterm Review."[71] The letter did not provide any substantive reason for reopening the MTE other than the automakers objected to the timing of the Final Determination. Subsequent to this letter, the Alliance of Automobile Manufacturers (Alliance), representing twelve leading auto manufacturers, and the Association of Global Automakers (Global Automakers), representing 12 foreign auto manufacturers, each sent EPA Administrator Scott Pruitt a letter on February 21, 2017 requesting that EPA "withdraw the Final Determination."[72] The link to the February 21, 2017 Auto Alliance letter is prominently posted on EPA's website for the midterm evaluation, right under the link to the Federal Register notice.[73] Both letters took issue with EPA's timeline and raised a number of procedural concerns, but did not provide any new data or information relevant to EPA's Final Determination.

On March 22, 2017, EPA and NHTSA issued a Notice of Intention to Reconsider the Final Determination.[74] As its rationale for reopening the MTE, EPA indicated that, "it is appropriate to reconsider its Final Determination in order to allow additional consultation and coordination with NHTSA."[75] In other public statements, agency and administration officials have indicated that a focus on economic health and job creation has motivated the decision to reopen the review of the

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https://www.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-greenhouse-gas (last visited Oct. 3, 2017).

[70] Notice of Intention To Reconsider the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light Duty Vehicles, 82 Fed. Reg. 14,671 (Mar. 22, 2017) [hereinafter NOI].

[71] *See* Ryan Beene, Auto CEOs Ask Trump to Revisit Obama-era Fuel Efficiency Rules, BLOOMBERG (Feb. 11, 2017) *available at* https://www.bloomberg.com/news/articles/2017-02-11/auto-ceos-ask-trump-to-revisit-obama-era-fuel-efficiency-rules (last visited Oct. 3, 2017).

[72] Letter, Auto Alliance to EPA Administrator G. Scott Pruitt, (Feb. 21, 2017), *available at* https://autoalliance.org/wp-content/uploads/2017/02/Letter-to-EPA-Admin.-Pruitt-Feb.-21-2016-Signed.pdf; Letter, Global Automakers to EPA Administrator G. Scott Pruitt, (Feb. 21, 2017), *available at* https://www.globalautomakers.org/system/files/document/attachments/2017-02-21_request_to_withdraw_final_determination.pdf.

[73] See EPA website at: https://www.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-greenhouse-gas

[74] NOI, 82 Fed. Reg. at 14,672.

[75] *Id.*

standards.[76] The agencies' NOI also comes amidst a broader review, initiated by the President, designed to identify and repeal health and environmental protections that are deemed to impact domestic fossil fuel production.[77]

The decision to reopen the MTE based on these considerations is without merit and should be withdrawn. In light of the robust technical record and other data supporting the Final Determination, as well the agencies' statutory responsibilities to protect human health and enhance energy efficiency of motor vehicles, the adoption of any standards less stringent than the current standards would be arbitrary and unlawful.[78] Indeed, as we summarize below, the extensive record demonstrates that even greater reductions are achievable and cost-effective. Reconsideration is not warranted by the record, but if EPA is to reconsider its final determination, the agency must consider options to strengthen the standards.

a. The record overwhelmingly supports a determination that the MY2022-25 standards are technically achievable and cost-effective

As outlined above, EPA, NHTSA, and CARB jointly conducted a multi-year mid-term review of the MY 2022-2025 standards, amassing a robust record, including examination of technical and economic analyses, meetings with stakeholders, and consideration of hundreds of thousands of public comments. The resulting Draft TAR, on which EPA's Final Determination is based, reflects the findings and conclusions of all three agencies. And those findings are clear: the 2022-2025 standards are technically achievable and cost effective, and can be met without adverse economic impacts. Indeed, the monetized fuel cost savings alone far exceed the cost of control technologies, so that the standards' benefits far exceed their costs, even without considering their many fold environmental and energy security benefits.

The Draft TAR, examined a wide range of factors, including technology advancements, the penetration of more fuel-efficient technologies in the marketplace, consumer acceptance of these technologies, trends in fuel prices and the vehicle fleet, employment impacts, and others. Even

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[76] *See, e.g.*, Remarks of President Trump at the American Center for Mobility, WASH. POST (Mar. 15, 2017) (suggesting a review is necessary to determine "[i]f the standards threaten auto jobs"), *available at* https://www.washingtonpost.com/video/politics/president-trumps-full-speech-in-ypsilanti-mich/2017/03/15/86765dd2-09b3-11e7-bd19-fd3afa0f7e2a_video.html (last visited Oct. 3, 2017).

[77] *See* Exec. Order No. 13783, Promoting Energy Independence and Economic Growth (Mar. 28, 2017), *available at* https://www.whitehouse.gov/the-press-office/2017/03/28/presidential-executive-order-promoting-energy-independence-and-economi-1 (last visited Oct. 3, 2017).

[78] Pursuant to the judicial review provisions of the Clean Air Act, a court reviewing EPA's GHG emission standards may reverse the action if it is found to be arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law. 42 U.S.C. § 7607; *see also Nat'l Petrochemical & Refiners Ass'n v. Envtl. Prot. Agency*, 287 F.3d 1130, 1135 (D.C. Cir. 2002). Similarly, NHTSA's CAFE standards are subject to the Administrative Procedure Act, which authorizes a reviewing court to hold unlawful an agency action found to be arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law. 5 U.S.C. § 706.

though EPA and NHTSA performed independent analyses in the Draft TAR, both agencies reached the same conclusions:[79]

- "A wider range of technologies exist for manufacturers to use to meet the MY2022-2025 standards, and at costs that are similar or lower, than those projected in the 2012 rule";
- "Advanced gasoline vehicle technologies will continue to be the predominant technologies, with modest levels of strong hybridization and very low levels of full electrification (plug-in vehicles) needed to meet the standards."

These conclusions were based on analyses that reflect the agencies' most current assessment of the feasibility of the 2025 standards. Based on NHTSA and EPA's analyses, there is no question that the auto industry is bringing new technologies to the market at a quicker pace and at lower cost than the agencies projected in the 2012 rulemaking for MY2017-2025: "manufacturers are adopting fuel economy technologies at unprecedented rates. Car makers and suppliers have developed far more innovative technologies to improve fuel economy and reduce GHG emissions than anticipated just a few years ago."[80] This has occurred while the industry has experienced an unprecedented period of growth – 2016 marked the seventh year in a row that car sales in the US set an all-time sales record.[81]

The analyses indicate that the costs for complying with the MY2022-2025 standards are lower than the agencies' estimates in the 2012 rulemaking for MY2017-2025. EPA's primary analysis shows MY2025 compliance costs (incremental to MY2021) significantly lower than those projected in the final rule ($252 lower for cars and $197 lower for trucks).[82] NHTSA's analysis shows similar downward trends in compliance costs.[83]

The agencies also concluded in the Draft TAR that the availability of the individual technologies needed to comply with the future standards are "generally consistent" with those projected in the final rulemaking.[84] The agencies did, however, find that several new technologies and developments in the Draft TAR were neither foreseen nor included in the analysis supporting the 2012 rulemaking for MY2017-2025.[85] Examples of these technologies include the application of

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[79] Draft TAR, at ES-2.
[80] EPA, Regulations for Emissions from Vehicles and Engines, Highlights from the Draft TAR, *available at* https://www.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-greenhouse-gas (last visited Oct. 3, 2017).
[81] Ahiza Garcia, Car Sales Set Another U.S. Record, CNN (Jan.4, 2017) *available at* http://money.cnn.com/2017/01/04/news/companies/car-sales-2016/index.html (last visited Oct. 3, 2017).
[82] *See* Draft TAR at ES-9; 77 Fed. Reg. at 62,665.
[83] *Id.*
[84] Draft TAR, 5-1.
[85] *Id.*

direct injection Atkinson Cycle engines to non-hybrids,[86] greater penetration of continuously variable transmissions (CVT), and greater use of diesel engines. The agencies concluded that these additional technologies contribute to lower cost compliance pathways.[87]

In its Proposed Determination and accompanying Technical Support Document (TSD), EPA considered over 200,000 public comments from individuals and about 90 organizations on the Draft TAR, as well as extensive additional studies conducted by the agency and others.[88] As a result, EPA updated technology costs, effectiveness, modeling, consumer impacts, and other aspects of its analysis supporting the Proposed Determination.[89] The robust analyses supporting the Proposed — and Final — Determination are comprehensive, and definitively confirm the conclusions reached in the Draft TAR. In fact, the primary analysis shows per-vehicle compliance costs to be significantly lower than those projected in the 2012 final rule and slightly less than those included in the Draft TAR.[90] The Proposed Determination continued to show, as did the Draft TAR, that auto manufacturers and suppliers are developing and deploying low emitting and fuel efficient technologies at a much faster rate than was forecast in the 2012 final rule. Furthermore, the Proposed Determination concluded that the MY2022-2025 standards are feasible, will achieve significant GHG emissions reductions, will deliver significant benefits to consumers, and that the auto manufacturers are meeting the standards more quickly than required—all during a time when the industry is thriving.[91]

As mentioned above, former EPA Administrator Gina McCarthy finalized a determination to maintain the current GHG emissions standards for MY2022-2025 vehicles on January 12, 2017. This Final Determination found that automakers are well positioned to meet the standards at lower costs than previously estimated. The Administrator concluded, based on the record in front of her, that "the success of the industry to date in achieving seven years of record sales while producing large variety of vehicles that meet or exceed the standards reflects the fact that the development and deployment of advanced technology conventional gasoline engines has happened consistent with a robust vehicle market, more rapidly than we predicted, and at cost

[86] Although NHTSA unaccountably appeared to ignore this technology in its analysis. See Draft TAR at Table ES-3 (NHTSA projects less than 1% penetration of higher compression ratio engines as a pathway to meet MY 2025 standards); Draft TAR at 13-62 (high compression rate engines projected at 0% for most manufacturers, including FCA and Ford, which have either already deployed such engines in their light duty vehicle fleets or announced plans to do so).
[87] *See* Proposed Determination at ES-3.
[88] Proposed Determination at ES-1.
[89] *See generally* Proposed Determination; EPA, "Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation: Technical Support Document," (Nov. 2016) [hereinafter TSD].
[90] Proposed Determination at ES-4; 77 Fed. Reg. at 62,665.
[91] Proposed Determination at ES-7.

that are comparable or slightly lower than we predicted."[92] The Administrator chose to "retain the current standards to provide regulatory certainty for the auto industry despite a technical record that suggests the standards could be made more stringent."[93]

Not only are manufacturers adding innovative low emitting and efficiency technologies at unprecedented rates, but these improvements have come while other metrics of vehicle performance have continued to improve, including acceleration times and durability.[94] For MY2016, there were already over 100 car, SUV, and pickup versions on the market meeting MY2020 or later GHG emission standards.[95] New technologies are being utilized that allow a number of individual vehicle models to meet standards all the way out to 2025—an extraordinary nine model years in advance.[96] In EPA's 2016 Fuel Economy Trends Report, it estimated that "17% of projected MY2016 vehicle production already meets or exceeds the MY2020 CO_2 emissions targets."[97]

This over-compliance has resulted in most manufacturers accruing large credit balances that could be used in future years. Seventeen of twenty manufacturers (representing 99% of MY2015 sales) carried a positive credit balance into MY2016.[98] We conducted an analysis to assess how many years these credits could facilitate future compliance if manufacturers did nothing more to improve GHG emission levels of their vehicles beyond MY2015 levels. This analysis is illustrative and intended to demonstrate how manufacturers' investments in technologies to reduce greenhouse gas emissions has created substantial credits that only further underscores the feasibility of complying with the MY2022-2025 standards. The underlying data used in this study can be found in EPA's "Greenhouse Gas Emission Standards for Light-Duty Vehicles: Manufacturer Performance report for the 2015 Model Year" and a detailed description of our methodology can be found in Attachment A. Our analysis found that banked credits alone – holding fleet greenhouse gas performance static beyond 2015 – are sufficient to allow full compliance through the 2018 model year with a significant balance remaining (42 million megatons of GHG credits) that could be used in the 2019 model year.

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[92] McCarthy, Gina, EPA Administrator to Stakeholders, January 12, 2017. Available at: https://www.epa.gov/sites/production/files/2017-01/documents/mte-stakeholder-letter-2017-01-12.pdf *(last visited October 4, 2017).*

[93] EPA, *Regulations for Emissions from Vehicles and Engines, Previous Steps in the Midterm Evaluation Process*, https://19january2017snapshot.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-greenhouse-gas-ghg_.html (last visited Oct. 3, 2017).

[94] Proposed Determination, A-48-49, A-71.

[95] Final Determination, 23.

[96] EPA, Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 through 2016, at ES-10 (Nov. 2016), *available at* https://www.epa.gov/sites/production/files/2016-11/documents/420s16001.pdf (last visited Oct. 3, 2017) [hereinafter 2016 Fuel Economy Trends Report].

[97] *Id.*

[98] GHG Emission Standards for Light-Duty Vehicles: Manufacturer Performance report for the 2015 Model Year," EPA-420-R-16-014, (November 2016) at 69.

We maintain that the extensive record summarized above strongly supports, at minimum, maintaining the MY2022-2025 standards included in the 2012 final rule. The Draft TAR and Final Determination firmly and convincingly provided the basis to reaffirm the MY2022-2025 GHG standards We agree and support EPA's January 2017 Final Determination that the current MY2022-2025 standards remain appropriate and that no changes are warranted. We also agree with EPA's assessment that "the current record, including the current state of technology and the pace of technology development and implementation, could support a decision to adopt more stringent standards for 2022-2025."[99]

b. EPA Must Consider the Recent Studies and New Data Released Since EPA Published Its Final Determination in January 2017

In addition to the extensive record already before EPA, there have been numerous studies and new data made available subsequent to the EPA's January 12, 2017 Final Determination. This new information demonstrates that even more stringent standards than those reflected in the October 2012 Final Rule are feasible and highly-cost effective. The reports listed below are directly relevant to EPA's deliberations and EPA must carefully evaluate and consider this new information in its reconsideration of the Final Determination of the Midterm Evaluation of the MY2022-2025 GHG standards:

1. Lutsey, Nic et.al., "Efficiency Technology and Cost Assessment for the U.S. 2025-2030 Light-Duty Vehicles," International Council on Clean Transportation (Mar. 2017), *available at* http://theicct.org/US-2030-technology-cost-assessment

   One of the objectives of this report, authored by the International Council on Clean Transportation (ICCT), was to update the midterm regulatory analysis for new MY2025 light-duty vehicles. ICCT's analysis considered the latest research literature, simulation modeling, and industry developments on technology efficiency and costs. One of the study's key findings was that "previous costs of compliance have been greatly overestimated" in both the Draft TAR and Final Determination. The study concludes that "state-of-the-art engineering studies and emerging supplier technology developments indicate that costs for lightweighting, direct injection, and cooled exhaust gas recirculation will be reduced by hundreds of dollars, and electric vehicles will drop by thousands of dollars per vehicle by 2025." Specifically, ICCT estimated the per vehicle compliance technology cost relative to the 2021 standards at $551 compared to EPA's Final Determination estimate of $875 and NHTSA's Draft TAR estimate of $1245. This report adds to the already substantial record demonstrating that *more* stringent standards deserve serious consideration.

[99] Proposed Determination at ES-7.

2. T. Cackette and R. Rykowski, "Technical Assessment of CO_2 Emission Reductions for Passenger Vehicles in the Post-2025 Timeframe," (Feb. 2017), *available at* https://www.edf.org/sites/default/files/content/final_public_white_paper_post_2026_co2_reductions2.27_clean.pdf

   Although the main thrust of this report was to determine achievable CO_2 emissions reductions and fuel economy levels in the 2030 timeframe, the authors also examined how much more CO_2 reduction could be achieved when relying only on currently available conventional technologies. The authors used the latest public version of EPA's OMEGA model (Version 1.4.56 and Pre-Processors made available by EPA in November 2016) and found that conventional technologies such as mild hybrids, Atkinson and Miller cycle engines "are projected to be underutilized in meeting the 2025 standard." This report reinforces the conclusion that more stringent CO_2 and fuel economy standards are achievable at reasonable cost by 2025.

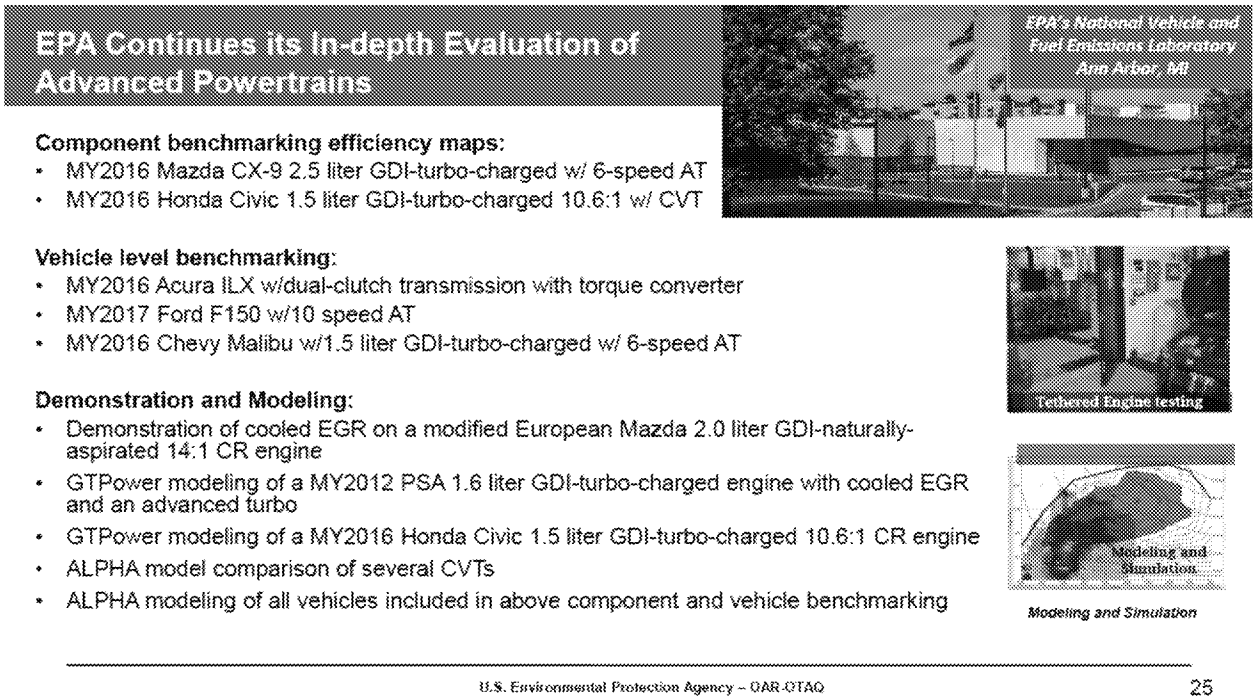
3. CARB, "California's Advanced Clean Cars Midterm Review," (Jan. 18, 2017), *available at* https://www.arb.ca.gov/msprog/acc/acc-mtr.htm

   This report presents CARB's technical analysis for the midterm review of the MY2022-2025 standards. Based on its technical review, CARB concluded that "Compliance with the current national GHG standards for model years 2022-2025 will result in equivalent or greater GHG benefits (at the same or lower cost to manufacturers) than originally projected for California and accordingly, consistent with the U.S. EPA Final Determination, changes to the stringency of the national or California GHG standards are not necessary or warranted." The conclusion California drew from its midterm review is consistent with every major analysis of the cost-effective feasibility of the MY2022-2025 standards, including the 2012 Final Rule, the Draft TAR, the January 2017 Final Determination, and numerous independent studies. This assessment and the previous reports must be carefully considered by EPA in its deliberations.

In addition to the reports listed above, EPA has indicated publicly that it is continuing in-house test programs and studies that will inform its reconsideration efforts. EPA staff, in a recent presentation at a Car Training Institute (CTI) Symposium in Novi, Michigan on May 17, 2017, summarized an extensive amount of new work underway involving evaluation of advanced powertrains, modeling updates and improvements, cost teardown studies, and consumer

willingness to pay.[100] Figures 1 and 2 below reproduce slides from EPA's presentation that summarize in more detail the new work EPA is undertaking.

Figure 1 - Ongoing Efforts to Evaluate Advanced Powertrains
(Slide 25 from "EPA's Technology Assessment for the 2025 GHG Standards," presented at the CTI Symposium USA, May 17, 2017.)



[100] Bolon, Kevin, "EPA's Technology Assessment for the 2025 GHG Standards," presented at the CTI Symposium USA (May 17, 2017), *available at* https://www.epa.gov/sites/production/files/2017-06/documents/cti-novi-2017-epa-2017-05-17.pdf.

Figure 2 - Additional EPA Work Underway
(Slide 27 from "EPA's Technology Assessment for the 2025 GHG Standards," presented at the CTI Symposium USA, May 17, 2017.)

Additional EPA Work Underway in Many Areas

- **Technology cost teardowns with FEV**: modern GDI turbo-downsized engine, advanced diesel engine, CVT
- Updates to OMEGA **cost-effectiveness optimization model** and ALPHA **full vehicle simulation model**
- Ongoing work to evaluate the **willingness to pay (WTP) for vehicle attributes** (e.g., power, fuel economy, size, etc).
  - Our review of 50+ papers from the last 20 years found very wide variation in these WTP values. Ongoing work evaluates what factors may contribute to this variation.
- **Ongoing evaluation of automotive reviews of MY2015 vehicle fuel efficient technologies**
  - Building upon EPA's study of MY2014 vehicles, we continue to find that positive evaluations for all technologies (70%) exceed negative evaluations of the technologies (18%)
- **Ongoing work to evaluate the vehicle miles traveled (VMT) rebound effect**
- Collaboration with Transport and Environment/Climate Change Canada on **mass reduction** and **aerodynamics**
- Continued evaluation of the vehicle fleet each year to assess technologies, emissions, and compliance – supporting EPA's forth-coming **MY2016 Manufacturer GHG Performance Report** and **2017 CO2/Fuel Economy Trends Report**

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As can be seen from these slides, EPA has a considerable amount of relevant new work underway that has a direct bearing on its reconsideration deliberations. EPA must carefully evaluate and consider the results from its efforts and from all of the new work that has occurred since the Final Determination was made in January 2017.

c. More Stringent MY2025 Standards are Feasible

As discussed above, EPA's Final Determination concluded that the current state and pace of technology development and implementation could support more stringent standards for MY2022-2025. EPA's Final Determination provided a robust demonstration that the existing standards are achievable and indeed, that more stringent MY2022-2025 standards are feasible and cost-effective. Analyses that EDF included in its comments on the Proposed Determination and recently updated with more recent technology cost and effectiveness data strongly support

these conclusions.[101] Therefore, if the Agency reopens the Final Determination it must consider strengthening the standards for MY2022-2025.

EDF contracted an analysis of 4 scenarios that are 10, 20, 30, and 40 g/mi more stringent than the current MY2025 target (173 g/mi) in order to ascertain the technology and cost implications of setting more stringent standards for MY2025.[102] For this analysis, we used the most recent docketed version of the OMEGA model and retained the same inputs and constraints that EPA used for the primary analysis in the Proposed and Final Determination and its Technical Support Document.[103]

The results of our analysis clearly demonstrate that the compliance pathways for these more stringent levels are cost effective and similar to those in EPA's analysis of the current MY2022-2025 standards. Notably, EPA's conclusion that "[a]dvanced gasoline vehicle technologies will continue to be the predominant technologies, with modest levels of strong hybridization and very low levels of full electrification (plug-in vehicles) needed to meet the standards" also holds true for the more stringent levels evaluated above.[104] The results also showed that the costs for meeting these more stringent scenarios are substantially outweighed by the lifetime fuel saving benefits to the consumer. This analysis clearly supports the conclusion that more stringent GHG emission standards are justified under the criteria guiding the midterm evaluation.[105]

Subsequent to the completion of the January 2017 Final Determination, EDF updated this analysis to reflect the results of a recent ICCT report that reassessed progress in the development of several light-duty fuel efficient technologies such as gasoline direct injection, cooled exhaust gas recirculation (EGR), cylinder deactivation, naturally aspirated Atkinson high compression ratio engines, turbocharged Atkinson (or Miller cycle) engines, electrically boosted turbocharging, weight reduction, diesel engines and electric vehicles. The ICCT report concluded that the technology costs used by EPA in the Draft TAR and Final Determination were "greatly overestimated."[106] Our latest analysis incorporates the cost and effectiveness projections made by ICCT into EPA's OMEGA model and assesses the potential impact of these projections on manufacturer compliance with the EPA GHG standards in MY2025. A detailed

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[101] Comments by Environmental Defense Fund on Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Standards Under the Midterm Evaluation, at 10-15 (Dec. 30, 2016).
[102] *Id.*
[103] *Id.* at 10-15.
[104] Draft TAR at ES-2.
[105] Comments by Environmental Defense Fund on Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Standards Under the Midterm Evaluation, at 10-14 and Attachment A (Dec. 30, 2016).
[106] Lutsey, Nic et.al., "Efficiency Technology and Cost Assessment for the U.S. 2025-2030 Light-Duty Vehicles," International Council on Clean Transportation, at iv (Mar. 2017), *available at* http://theicct.org/US-2030-technology-cost-assessment.

description of our modeling methodology, technology effectiveness, cost updates, and OMEGA modeling results can be found in Attachment B.

The results of our analysis are summarized in Table 1 below, which is similar to Table ES-1 in EPA's Final Determination document.[107] Table 1 shows fleet-wide penetration rates of a subset of key technologies projected to be utilized to comply with the MY2025 standards. The first column, "Final Determination," presents technology penetrations using EPA's Final Determination inputs and OMEGA modeling methodology.[108] The second column is an updated Final Determination run using ICCT's updated technology costs and effectiveness estimates. The other columns present our results for the four scenarios of increasing stringency using the updated OMEGA modeling inputs. The technology penetrations are absolute and the costs are MY2025 costs incremental to MY2021.

Table 1

Selected Technology Penetrations and Per Vehicle Costs (2015 $)
to Meet Increasingly More Stringent Standards
(Incremental to the Cost of Meeting MY 2021 Standards)

	Final Determination (CO2 Target = 173 g/mi)	Updated Final Determination (CO2 Target = 173 g/mi)	Scenario 1 (Fleet Target = 163 g/mi)	Scenario 2 (Fleet Target = 153 g/mi)	Scenario 3 (Fleet Target = 143 g/mi)	Scenario 4 (Fleet Target = 133 g/mi)
Turbocharged and downsized gasoline engines (%)	41	13	11	9	11	13
Higher compression ratio, naturally aspirated gasoline engines (%)	36	62	70	75	77	72
8 speed and other advanced transmissions (%)	91	93	92	91	88	85
Mass reduction (%)	9	7	7	7	7	7
Off-cycle technology	30	1	4	9	24	49
Stop-start (%)	39	6	5	3	3	5
Mild Hybrid (%)	15	10	16	26	37	48
Strong Hybrid (%)	3	2	2	2	2	2
Plug-in hybrid electric vehicle[7] (%)	2	2	2	2	2	3
Electric vehicle[7] (%)	5	3	4	6	8	12
Per vehicle cost (2015$)	1050	583	804	1072	1410	1877

[107] Final Determination at 4.
[108] *Id.*

As can be seen from these results, Scenarios 2 and 3 (targets of at least 20 to 30 g/mi more stringent than the current standards) can be met cost effectively with the same advanced gasoline vehicle technology pathways projected to be utilized to meet the existing MY2025 standards. In fact, the per-vehicle cost for Scenario 2 is essentially identical to the projected costs from the Final Determination. Scenario 4 also requires low levels of strong hybrids and EVs to comply, as was the case in EPA's Final Determination primary analysis for MY2025.

The costs for meeting all of these more stringent scenarios are substantially outweighed by the lifetime fuel saving benefits to the consumer (see Table 2 below). For example, the $1072 per-vehicle cost for Scenario 3 is offset by the expected lifetime fuel savings by a factor of more than three to one. And the lifetime fuel savings for Scenario 4 is estimated to be about double the estimated savings for the existing MY2025 standards, or about $2711 per vehicle relative to MY2021. For this same scenario, the incremental cost relative to the existing MY2025 standards would be $1877 per vehicle while the estimated incremental lifetime fuel savings is estimated at about $5184. Clearly, the lifetime fuel savings alone would easily offset the cost of complying with more stringent standards even without including societal monetized benefits. If societal monetized benefits were added to the fuel savings, the case for more stringent standards would be even more compelling.[109]

Table 2

Updated Per Vehicle Costs ($) and Lifetime Fuel Savings ($) Comparison for a Sales-Weighted MY2025 Vehicle

Scenario Description	Per Vehicle Cost (Incremental to Cost of Meeting MY2021 Standards)	Per Vehicle Cost (Incremental to FD Existing MY2025 Standards)	Lifetime Fuel Savings (Incremental to MY2021 Standards)	Lifetime Fuel Savings (Incremental to Existing MY2025 Standards)
Existing MY2025 Standards (CO2 Fleet Target = 173 g/mi) - Final Determination	1050	.....	2473	.....
Existing MY2025 Standards (CO2 Fleet Target = 173 g/mi) - Updated Final Determination	583	-467	2473	.....
Scenario 1 (CO2 Fleet Target = 163 g/mi)	804	-246	3144	671
Scenario 2 (CO2 Fleet Target = 153 g/mi)	1072	-22	3819	1347
Scenario 3 (CO2 Fleet Target = 143 g/mi)	1410	360	4501	2029
Scenario 4 (CO2 Fleet Target = 133 g/mi)	1877	827	5184	2711

Notes:
1.) All costs are 2015$ and discount rate of 3% was used.
2.) Assumes AEO 2016 reference fuel prices as used in EPA's Final Determination analysis.

[109] Proposed Determination at ES-6.

These results clearly demonstrate that the compliance pathways for the more stringent levels evaluated are cost effective and similar to those in EPA's analysis. This updated analysis shows that the compliance cost for some stringency scenarios (Scenarios 1 and 2), are comparable or less costly than the compliance cost projections EPA used to make its Final Determination. Furthermore, EPA's conclusion that "[a]dvanced gasoline vehicle technologies will continue to be the predominant technologies, with modest levels of strong hybridization and very low levels of full electrification (plug-in vehicles) needed to meet the standards," also holds true for the more stringent levels evaluated above.[110] This analysis clearly supports the case that more stringent standards could have been justified under the criteria guiding the MTE. As EPA proceeds with its reconsideration of the MTE, the Agency must evaluate and seriously consider the appropriateness of increasing the stringency of the MY2022-2025 standards.

III. Additional factors further confirm conclusion that standards are achievable and appropriate.

a. To the extent EPA considers these factors, the agency cannot do so in a way that undermines the Clean Air Act's pollution reduction purposes

EPA seeks comments regarding its intent to reconsider the Final Determination of the Midterm Evaluation and provides two sets of factors that it intends to contemplate as it makes this decision.[111] The first set of factors is directly responsive to EPA's mandate to reduce pollution emissions, and was first enunciated by the agency in its 2012 final rule establishing emissions standards for MY2017-21 and MY2022-25 light-duty vehicles. In that rule, EPA promulgated regulations to ensure that its Midterm Evaluation reviewing the appropriateness of the MY2022-25 standards would fulfill the purpose of section 202(a)(1) and (2).[112] The regulations establishing the MTE process explicitly delineate the factors the agency will consider to determine the appropriateness of the standards, including their "feasibility and practicability"; the "impact of the standards on reduction of emissions, oil conservation, energy security, and fuel savings by consumers"; and the "cost on the producers or purchasers of new motor vehicles or new motor vehicle engines."[113]

EPA's authority flows directly—and solely—from Congress's direction to the Agency to address harmful emissions from vehicles under Section 202 of the Clean Air Act. The Section 202 standards must reflect the factors relevant to fulfilling the Agency's obligations under the Act. Reducing emissions that endanger public health and welfare is the paramount purpose of Section

[110] Draft TAR at ES-2.
[111] EPA 2017 Request for Comment, 82 Fed. Reg. at 39,551.
[112] 2012 Final Rule; 40 CFR 86.1818—12(h)(1).
[113] *Id.*

202. Feasibility—the time "necessary to permit the development and application of the requisite technology"—is expressly delineated as a factor in the statute, as is "appropriate consideration to the cost of compliance." Other factors may be considered by the Agency, and may be evaluated in the context of a regulatory impact analysis, but their evaluation cannot usurp the role of the statutory factors in shaping the standards themselves.

The second set of factors EPA now intends to consider have not previously been evaluated by the agency as part of the thorough rulemaking process it underwent to develop the MY2022-2025 vehicle emission standards. To the extent EPA elects to consider these additional factors, it must do so in a way that does not undermine the underlying objective of section 202: to reduce pollutant emissions to protect public health and welfare. As noted above, starting with the 1965 CAA Amendment, Congress made clear that the purpose of section 202 was to reduce air pollution through the imposition of stringent, forward-looking emissions limitations on motor vehicles.[114]

As the nation's highest court has recognized, the legislative history of the CAA underscores that Congress did not intend for EPA to be "'limited by what is or appears to be technologically or economically feasible,' but 'to establish what the public interest requires to protect the health of persons,' even if that means that 'industries will be asked to do what seems to be impossible at the present time.'"[115] As the United States Court of Appeals for the D.C. Circuit explained shortly after enactment of the Act's key motor vehicle emissions standards, "[t]he legislative background must also take into account the fact that in 1969 the Department of Justice brought suit against the four largest automobile manufacturers on grounds that they had conspired to delay the development of emission control devices."[116]

The existing MY 2022-25 standards for light-duty vehicles, as promulgated in 2012 and confirmed in the 2017 Final Determination of the MTE, were developed and implemented to satisfy the intent of Congress—that EPA "force the state of the art" in order to reduce air pollution emitted by vehicles.[117] Any reconsideration of those standards by EPA must proceed similarly. Although EPA "may flesh out the interstices of a technical regime, that discretion does

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[114] 42 U.S.C. § 7521(a).

[115] *Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 490-91 (2001) (quoting 116 Cong. Rec. 32,901-32,902 (1970), 1 *Legislative History of the Clean Air Amendments of 1970* (Committee Rep. compiled for the Senate Committee on Public Works by the Library of Congress), Ser. No. 93-18, 227 (1974)).

[116] *Int'l Harvester Co. v. Ruckelshaus*, 478 F.2d 615, 623 (D.C. Cir. 1973); *see also United States v. Automobile Mfrs. Ass'n.*, 307 F. Supp. 617, 618 (C.D. Cal. 1969) (entering a consent decree between automobile manufacturers and DOJ regarding charges of Sherman Act violations for conspiracy to "eliminate competition in the research, development, manufacture and installation of motor vehicle air pollution control equipment").

[117] *Int'l Harvester Co. v. Ruckelshaus*, 478 F.2d 615, 623 n.13 (D.C. Cir. 1973) (citing 116 Cong. Rec. 33,120 (1970) (newspaper report of statement of Senator Eagleton introduced into the record by Senator Muskie)).

not entitle the agency to arrogate to itself purposes outside the statutory provision it is applying."[118]

Judicial review of EPA rules under section 202, under the arbitrary and capricious standard, "is principally concerned with ensuring that EPA has examined the relevant data and articulated a satisfactory explanation for its action including . . . that the Agency's decision was based on a *consideration of the relevant factors*."[119] Because the agency articulated a precise list of relevant factors to be considered during the MTE process in its 2012 rule, codified at 40 CFR 86.1818—12(h)(1); and provided a thorough explanation of each factor and its corresponding analysis in support of the Final Determination of the MTE[120]; its inclusion of a substantial number of new factors now with limited explanation draws attention. The assessment of any factors in reevaluation of these vehicle emission standards must be consistent with the statutory terms and should be undertaken only with focus on the statute's ultimate goal of reducing pollution.

A number of the additional factors EPA now identifies focus on consumer behavior and preference in the vehicle market.[121] Although the agency has properly engaged in consideration of the costs of the emissions standards—the original factors established in the 2012 rule include "[t]he cost on the producers or purchasers of new motor vehicles or new motor vehicle engines," and "[t]he impact of the standards on the automobile industry"[122]—that weighing of financial burdens does not require EPA to make pollution control decisions based on perceived or studied consumer preferences. In a decision regarding another section 202 emission control standard, the court has stated: "[A]s long as feasible technology permits the demand for new passenger automobiles to be generally met, the basic requirements of the [Clean Air] Act would be satisfied, even though this might occasion fewer models and a more limited choice of engine types. The driving preferences of hot rodders are not to outweigh the goal of a clean environment."[123]

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[118] *API v. Envtl. Prot. Agency*, 706 F.3d 474, 480 (D.C. Cir. 2013) (citing *Catawba Cnty. v. Envtl. Prot. Agency*, 571 F.3d 20, 36-38 (D.C. Cir. 2009)).
[119] *Sierra Club v. EPA*, 774 F.3d 383, 398 (7th Cir. 2014) (quoting *Bluewater Network v. EPA*, 370 F.3d 1, 11 (D.C. Cir. 2004)) (emphasis added); *see also Nat'l Petrochemical & Refiners Ass'n v. Envtl. Prot. Agency*, 287 F.3d 1130, 1135 (D.C. Cir. 2002) (explaining that the court reviews CAA motor vehicle emissions rules "under the arbitrary and capricious standard of 42 U.S.C. § 7607(d), which is indistinguishable from the Administrative Procedure Act equivalent").
[120] Final Determination at 17-28.
[121] "The extent to which consumers value fuel savings from greater efficiency of vehicles;" "The extent to which consumers value fuel savings from greater efficiency of vehicles;" and "The impact of the standards on consumer behavior, including but not limited to consumer purchasing behavior and consumer automobile usage behavior (*e.g.* impacts on rebound, fleet turnover, consumer welfare effects, etc.)." 82 Fed. Reg. 39,551, 39,553 (Aug. 21, 2017).
[122] 2012 Final Rule at 63161.
[123] *Int'l Harvester Co. v. Ruckelshaus*, 478 F.2d 615, 640 (D.C. Cir. 1973).

A newly-identified factor in EPA's request for comment is "[t]he availability of realistic technological concepts for improving efficiency in automobiles that consumers demand."[124] As discussed previously, the purpose of section 202 is not to develop standards based on unknowable predictions of vehicle popularity—it is to require automakers to decrease the emissions of the vehicles they offer on the market in order to address air pollution that endangers public health and welfare. Like other core Clean Air Act provisions, Section 202 is designed to protect third parties from the harms caused by polluting activities. That central thrust may not be diluted by resort to uncertain and manipulable claims asserting consumer preferences for relatively high-polluting cars.

Another of the new factors on which EPA invited comment is: "The ability for OEMs to incorporate fuel saving technologies, including those with 'negative costs,' *absent the standards*."[125] Section 202 of the CAA mandates that EPA develop and implement vehicle standards for the "emission of any air pollutant" which causes or contributes to "air pollution, which may reasonably be anticipated to endanger public health or welfare."[126] Since greenhouse gases fit within the CAA definition of air pollutant, EPA must promulgate emission standards accordingly.[127] The ability or willingness of an auto manufacturer to voluntarily incorporate technologies that reduce greenhouse gases in the absence of regulation—although, of course, encouraging—is not relevant to the appropriateness of EPA's MY2022-25 emission standards for light-duty vehicles.

b. EPA's existing, well-documented findings on consumer behavior support the appropriateness of MY2022-2025 standards

EPA comprehensively addressed relevant issues relating to consumer acceptance of fuel economy and GHG reduction technologies in the draft TAR, Proposed Determination, and January 2017 Final Determination. Issues there addressed include effects of the standards on vehicle sales, consumer response to the standards, impacts of the standards on vehicle affordability, and evidence — or lack thereof — of adverse effects on consumer welfare.

As EPA recognized, its standards lead to substantial savings for consumers. Just one of the compelling findings with respect to consumer benefits was that families that purchase a new vehicle in 2025 are expected to save a net $1,650 over the lifetime of that vehicle compared to a vehicle just 3 years older—and possibly much more.[128] Families purchasing on credit would

[124] EPA 2017 Request for Comment, 82 Fed. Reg. at 39,551, 39,553.
[125] EPA 2017 Request for Comment, 82 Fed. Reg. at 39,553.
[126] 42 U.S.C. § 7521(a)(1).
[127] *See Massachusetts v. EPA*, 549 U.S. 497, 528 (2007).
[128] Proposed Determination at E-6.

expect to see immediate payback: the increased load cost attributable to control technologies would be more than offset in the first year by fuel savings.[129]

Meanwhile, the agency concluded that there is "little, if any, evidence that consumers have experienced adverse effects from the standards."[130] Likewise, the agency did not find "any evidence that the technologies used to meet the standards have imposed 'hidden costs' in the form of adverse effects on other vehicle attributes."[131] Nor did EPA identify "significant effects on vehicle affordability."[132] Given the ten years of lead-time provided to achieve the MY 2022-2025 standards, EPA reasonably expected "that any effects of the standards on the vehicle market will be small relative to market responses to broader macroeconomic conditions."[133] As with all other aspects of the Final Determination, there is no evidence that there have been any changes in facts or circumstances that would justify a change of position.

Reasoned decision making requires that EPA acknowledge and comprehensively take into account and discuss its existing, well-documented and reasoned findings regarding consumer acceptance, in which case it should reach the identical conclusion: there is no evidence on this issue that would justify a finding that the MY 2022-2025 standards are inappropriate.

i. EPA standards save consumers money

Strong fuel economy and GHG standards for passenger cars benefit consumers by saving them money at the pump. Because of the savings, consumers are demanding more efficient models and automakers are delivering them. And more efficient models in the new car market leads to more efficient options in the used car market, helping low-income families save money on fuel as well.

The current light-duty vehicle standards are already saving consumers money at the pump. For example, each F-150 bought in 2015 will use about 180 fewer gallons of gas a year than prior models, and will save its owner eight trips to the gas station and $300 to $700 per year, depending on the price of fuel.[134]

And the 2022-2025 standards will provide even greater savings – allowing families who purchase a new vehicle in 2025 to save a net $1,650 over the lifetime of that vehicle compared to

[129] Proposed Determination at E-6.
[130] Proposed Determination at 27.
[131] Proposed Determination at A-27.
[132] Proposed Determination at 28.
[133] Final Determination at 25; *see also* Proposed Determination at 51-52.
[134] BlueGreen Alliance, Combating Climate Change 426,000 Pickup Trucks At a Time, (June 2016) *available at* https://www.bluegreenalliance.org/resources/combating-climate-change-426000-pickup-trucks-at-a-time/ (last accessed Oct. 4, 2017).

a vehicle just 3 years older.[135] Further, the savings could double depending on future oil prices. And the nearly 86 percent of Americans who finance their vehicles with a 5-year loan are expected to realize the cost savings within the first year.[136] Over the life of the entire Clean Cars program, the fuel cost savings to American families and businesses will add up to $1.7 *trillion*,[137] which is more than double the funds injected into the economy by the American Recovery and Reinvestment Act (aka, the stimulus package).[138] When businesses reduce fuel costs, it allows them to invest more money and create more jobs in local communities.

Because of these fuel cost savings, consumers continue to rate fuel economy as one of their top criteria when shopping for a new car[139] – 81 percent said they support the Clean Car standards.[140] And consumers have more choices in fuel-efficient models across the fleet today (see Figure 3 below). There are more than twice as many SUV models that achieve 25 mpg or more in MY 2016 than there were in MY 2011. The number of car models, where at least one variant has a combined city/highway label fuel economy of at least 30 mpg, has grown from 39 models in MY 2011 to more than 70 models in MY2016. There are 18 MY2016 pickup and minivan/van models for which at least one variant of the model has a combined city/highway label fuel economy rating of 20 mpg or more.[141]

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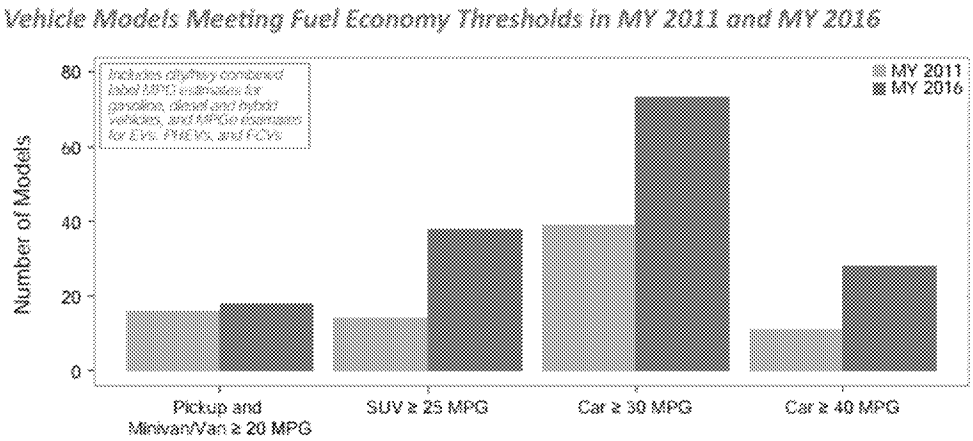
[135] Proposed Determination at E-6.
[136] *Id.*
[137] EPA Regulatory Announcement.
[138] Congressional Budget Office, Estimated Impact of the American Recovery and Reinvestment Act on Employment and Economic Output from October 2011 Through December 2011 (Feb. 2011) *available at* http://www.cbo.gov/sites/default/files/cbofiles/attachments/02-22-ARRA.pdf (last accessed Oct. 4, 2017).
[139] Despite Cheap Gas, Fuel Efficiency Still a Primary Concern, JD Power (Jan. 14, 2015) *available at* http://www.jdpower.com/press-releases/2015-us-avoider-study (last accessed Oct. 4, 2017).
[140] Jack Gillis et al., Automakers Are on the Road to Meeting Fuel Efficiency Standards: An Analysis of Automaker Progress in Meeting 2025 Fuel Efficiency Requirements and A Look At Consumer Attitudes Towards Fuel Efficiency, Consumer Federation of America, (April 25, 2016) *available at* http://consumerfed.org/wp-content/uploads/2016/04/2016-Fuel-Economy-Report-April-25-2016.pdf (last accessed Oct. 4, 2017).
[141] EPA, Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975–2015 (Dec. 2015) *available at* https://www3.epa.gov/otaq/fetrends-complete.htm https://www.epa.gov/sites/production/files/2016-11/documents/420s16001.pdf (last accessed Oct 3, 2017) [hereinafter EPA 2015 Trends Report].

Figure 3



Source: EPA's Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 – 2015

ii. No reliable evidence demonstrates a negative impact on consumer choice

EPA convincingly showed that there is at present no reliable way to quantify the effect of the standards on vehicle sales. In particular, EPA engaged in a comprehensive literature search of all existing efforts to develop reliable consumer choice models that could yield quantitative predictions with adequate validity for use in policy making and found that there were no such models.[142] This finding is consistent with the NAS (2015) finding that the role of fuel economy on consumer purchasing decisions is "unresolved".[143]

EPA also comprehensively analyzed the willingness-to-pay literature and found that estimates of willingness-to-pay for both fuel economy and performance are so varied (by over five orders of magnitude in the literature) as to preclude the drawing of reliable, quantifiable conclusions.[144] EPA's most recent presentation of this analysis (March 2017) continued to conclude that the results vary widely even within studies — raising the issue of robustness of the stated willingness-to-pay values, and further suggesting a lack of robustness in the models used to generate the values.[145]

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[142] Automakers have been trying to develop such reliable predictive tools without success. See Proposed Determination App. A at A-47 summarizing comments of the Alliance that industry had tried and failed for a century to develop reliable quantitative consumer choice models. EPA's own efforts to develop such a model were likewise unsuccessful. Draft TAR at 6-4 to 6-5.

[143] Final Determination RTC at 126; citing NAS (2015).

[144] *See* Proposed Determination App. A at A-51; Proposed Determination TSD at 4-16

[145] David Greene et. al., Consumer Willingness to Pay for Vehicle Characteristics: What Do We Know?, (Mar.16, 2017) *available at*

EPA found no evidence of consumer acceptance issues for conventional, non-electrified technologies, which form the overwhelming majority of the compliance path posited convincingly by EPA for the MY 2022-2025 standards.[146] There also is evidence of increased consumer acceptance of electrification based strategies (strong hybrid, PHEV, and BEV vehicles),[147] but because the Final Determination is not premised on compliance pathways necessitating any significant production of such electrified vehicles, the issue of acceptance of a significantly broader use of electrification is not pertinent to the reasonableness of EPA's finding of standard appropriateness. That said, the flood of announcements from major manufacturers — Ford and GM being the latest — of plans to electrify either some or all of their light-duty fleets strongly suggests that manufacturers believe there will be broad consumer acceptance of the technology, and do not view the technology as generating consumer resistance.[148]

EPA concluded that to date there is no evidence that the standards have had a negative impact on light-duty vehicle sales.[149] This is consistent with market trends—where industry has just experienced seven successive years of greatest sales ever.[150] In addition, new vehicle prices have remained flat in recent years after adjusting for inflation and quality.[151] Because the record shows no evidence of any impediment to sales, EPA reasonably concluded that there was no reliable way to make reasoned quantitative estimates of the effect of the standards on fleet turnover.[152]

Some commenters suggest that the "energy paradox" or "efficiency gap"— consumers' failure to adopt efficiency technologies notwithstanding these technologies net financial benefits—must mean that there are some hidden cost that are preventing adoption, which EPA failed to account for. But there are multiple potential reasons for the energy paradox that do not require hypothesizing an unidentified hidden, countervailing cost, as EPA has reasonably noted. These reasons include, on the consumer side: lack of adequate information necessary to estimate the value of future fuel savings; mistaken valuation or uncertainty in calculating future fuel savings; a focus on attributes conveying visible status rather than invisible efficiency; and (pre-standards), a lack of available fuel efficient options among vehicles (like SUVs) having other desirable attributes.[153] On the producer side, reasons for the efficiency gap include hesitation to be a first

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https://benefitcostanalysis.org/sites/default/files/public/C3.1%20Helfand%20et%20al%20WTP%20for%20veh%20char%2020170323.pdf (last accessed Oct. 4, 2017).

[146] Draft TAR p. 6-13; Proposed Determination App. A at A-56.

[147] Proposed Determination, App. A at A-63 to A-65.

[148] For example *see* https://www.eenews.net/greenwire/stories/1060062413/feed (last visited October 4, 2017).

[149] Proposed Determination App. A at A-27.

[150] Garcia, Car Sales Set Another U.S. Record, *supra note* 81.

[151] Final Determination RTC at 136.

[152] Final Determination RTC at 137.

[153] Draft TAR at 6-6; 77 Fed. Reg. at 62,914.

mover in investing in a new technology; the related desire of manufacturers to wait until a technology is further along the learning curve; and another related desire of manufacturers to work on the same technologies at the same time to benefit from the arising research synergies.[154]

The agency's notice suggests that the EPA is reconsidering the issue of "consumer welfare effects, etc."[155] The record again reflects the copious, reasoned consideration EPA has already given this issue. The agency concluded that it had found no evidence of a so-called hidden cost to the standards.[156] It is clear that consumers value fuel economy, although estimates of how much vary widely.[157] The NAS reached the same conclusion that the range of potential values for consumer willingness to pay for fuel economy is so varied as to preclude easy generalizations as to how much.[158] EPA already included in its cost estimates the cost of holding all vehicle attributes, including performance, constant in the presence of the added GHG reduction technologies.[159] Beyond this already accounted for cost, there is no evidence that the standards have had, or will have, an adverse effect on other vehicle attributes.[160]

Most importantly—as discussed above—fuel savings far exceed increased expenditures for the emission control technology, so there is a direct, positive welfare benefit to consumers of new light duty vehicles.

iii. The vehicle standards have no discernable negative effect on vehicle affordability

EPA also closely examined the impacts of the standards on vehicle affordability. EPA found, with ample record support, that the standards did not have discernible negative impacts on lower-income households, on the used vehicle market, did not limit access to credit, and had not decreased availability of low-priced vehicles.[161] In particular, lower-income households are more affected by prices of used rather than new vehicles, and, although any effect of the standards on used vehicle prices is swamped by macro-economic factors, the payback period for price increases reflecting GHG emission reduction technology is less than for new vehicles given the depreciated price of a used vehicle but the constant performance of the emission reduction technology.[162] In addition, used car market prices have remained flat.[163] Consumer loans for

[154] Draft TAR at 6-7. As noted below, one benefit of the standards is to eliminate these producer-side issues.
[155] 82 Fed. Reg. at 39,553.
[156] Final Determination RTC at 127.
[157] Final Determination RTC at 124.
[158] *See* Final Determination RTC at 126; NAS (2015) at 318.
[159] Final Determination RTC at 129; Proposed Determination App. A at A-49 and A-50.
[160] Proposed Determination App. A section B.1.4.
[161] *See generally* Proposed Determination TSD at sec. 4.3.3.
[162] Proposed Determination TSD at 4-49 and 4-47; Proposed Determination, App. A at A-79.
[163] Proposed Determination TSD at Fig. 4-26.

new vehicles remain widely available, and importantly, if consumers were to buy a new vehicle with standard five-year financing, the payback period (with gasoline at pre-hurricane Harvey prices) would be less than one year.[164]

Strong fuel economy and GHG standards indeed provide a strong co-benefit to used-vehicle purchasers by providing them with more efficient choices. When fuel prices become suppressed, new vehicle purchases can skew towards less efficient vehicles, and when fuel prices are high they tend to purchase relatively more fuel-efficient vehicles. This pattern has important consequences for the used vehicle market, where the supply of each model and vintage is largely determined by the past choices of new-vehicle purchasers, and the supply of a particular used vehicle model is essentially inelastic. That is, the choices of today's new-vehicle purchasers will determine which vehicles are available to tomorrow's used vehicle purchasers, and determine the fuel economy of the fleet for many years after the original purchase date. Strong fuel economy and GHG standards lead automakers to offer more diverse sets of products, including more efficient models,[165] which will have the co-benefit of increasing the supply of fuel-efficient used vehicles available for purchase. To the extent that low-income consumers are more likely to purchase a used vehicle, more efficient used vehicle choices will help save low-income families more money at the pump.

iv. EPA fully accounted for vehicle performance

Other commenters argued that there was a specific hidden consumer welfare cost to the standards in the form of decreased performance. Notwithstanding that EPA already estimated the cost of holding performance in its cost estimates for the MY2022-2025 standards[166], this argument contends that there would be still more performance added but for the standards, and that this lost performance is a consumer welfare loss not accounted for in the agency's cost estimates. The asserted engineering basis for this argument is that there is a necessary tradeoff between fuel economy/GHG emission reduction and performance (acceleration in particular). Some of the commenters supported their arguments by pointing to consumer willingness to pay studies, maintaining that these studies show a greater willingness of consumers to pay for increased performance than for fuel economy, confirming a hidden cost to the standards not reflected in EPA's cost estimates.

The record convincingly refutes these arguments. Most particularly, the historic tradeoff between performance and fuel economy is far less likely to hold for advanced technology

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[164] Proposed Determination TSD at 4-50.
[165] Meghan R. Busse et. al., Who is Exposed to Gas Prices? How Gasoline Prices Affect Automobile Manufacturers and Dealerships, 14 QUANTITATIVE MARKETING & ECONOMICS, 41-96 (Mar. 2016) *available at* https://dspace.mit.edu/handle/1721.1/103416 (last accessed Oct. 3, 2017).
[166] See , e.g. Proposed Determination App. A at A-58.

engines.[167] EPA's reasoned conclusion is that "the assumption in the previous research that the tradeoffs among acceleration, fuel economy, and weight are constant does not appear to accurately represent the new technologies, and in fact may substantially overestimate the magnitude of the performance-fuel economy tradeoff."[168] Thus, "fuel economy and other vehicle attributes are not mutually exclusive, so there is no necessary tradeoff between fuel economy and other vehicle attributes."[169] And EPA has already included the cost of preserving both.[170] The studies submitted to the record purporting to show a hidden cost of foregone increased performance reflected older engine technologies, and so failed to account for these highly relevant technology distinctions.[171]

v. Industry's cited studies have been comprehensively refuted

EPA, as well as many commenters, also showed that the report of the Center for Automotive Research (CAR), which was relied upon in comments of many manufacturers and the National Automobile Dealers Association and which makes quantified predictions of MY 2025 standards on sales and industry employment, was deeply flawed and not credible. Among other things, the CAR report bases predictions on a 25-year old study reflecting unreformed CAFE and therefore assumed a compliance strategy of changing sales mix without changing vehicle content, assumed arbitrary price increases for vehicles well beyond credible bounds because it was not based on any technology-based analysis, and erroneously assumed that average price of vehicles is based only on historic trends and not market forces.[172] Earlier comments that EDF already submitted detail many of the same deficiencies, and several additional ones, including an improper regression analysis, failure to provide evidence of model validation, and an improper comparison of elasticity of volume expenditures with respect to price and sales volume with respect to price.[173] We hereby incorporate those comments in full (See Attachment E).

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[167] See, in particular, Proposed Determination TSD at 2-248 and 2-249 showing that gasoline direct-injection engines and turbo downsized engines have much flatter trade off curves than the older, port-fueled engines.
[168] Proposed Determination, App. A, at 4-6.
[169] Final Determination RTC at 127.
[170] *Id.*
[171] A recent paper addressing this issue, Leard, Linn, and Zhou, "How Much Do Consumers Value Fuel Economy and Performance" (2017) likewise assumes that there is a necessary tradeoff between fuel economy improvement and performance, basing this conclusion on Knittel (2011) and Klier and Linn (2016) which studies did not account for the difference in more advanced engine technologies and performance. See Proposed Determination App. A at 4-6. In addition, Leard et al. (2017) acknowledges that their analysis omits any valuation of standard-based innovation. *Id.* at 27.
[172] Final Determination RTC at 126-127; Proposed Determination TSD at 4-17 to 4-18.
[173] EDF Supplemental Comments submitted to EPA and NHTSA on the Proposed Determination in response to "Corrections and clarifications to the various references to the Center for Automotive Research's The Potential Effects of the 2017-2025 EPA/NHTSA GHG/Fuel Economy mandates on the U.S. Economy" as found on pp. A-41 through A-42; A-80 and A-87 and the Technical Support Document, pp. 4-17 through 4-20." (Submitted Jan. 11, 2017) to Docket EPA-HQ-OAR-2015-0827.

Another study sponsored by the Alliance of Automobile Manufacturers, conducted by a group of authors at Indiana University (hereafter "IU study"), found net economic long-run benefits from a combination of state and federal vehicle efficiency, greenhouse gas, and zero emissions vehicle (ZEV) programs. Yet despite these findings, the authors made a case for weakening vehicle standards based on their estimates of negative vehicle sales and short-term job losses.[174] A recent critique by Synapse Energy Economics found that modest corrections to the IU study's data and methodology would lead to the opposite conclusion – strong economic gains and favorable cost-benefit ratios, from existing vehicle standards. For example, the IU study overestimates the value of car loan interest rates, uses inconsistent discount rates that are far higher than the standard, and completely fails to account for the benefits of greenhouse gas reductions despite the rule being a GHG-reducing policy.[175] Adjusting for these errors, the IU study should have concluded that the light-duty GHG standards will lead to strong economic gains.

vi. The record demonstrates that the standards have important non-monetized benefits

The GHG standards have important benefits that are not included as monetized benefits in EPA's analysis. These include technology innovations that would not occur in the absence of the standards.[176] The standards remove several producer-side disincentives — fear of being a first mover, waiting for technologies to benefit from others' learning by doing, and synergistic common research efforts — which contribute to market failures and underinvestment in efficient technologies.[177] The rule's incentive to generate credits also contributes to the burst of innovation that marked the advent of the light-duty GHG standards.[178] These innovations have been accompanied by collateral benefits for consumers in many instances, among them improved braking and handling (mass reduction), greater corrosion resistance (mass reduction), improved launch feel from advanced transmissions, greater passenger comfort from reduced cabin warm-up times (head-integrated exhaust manifolds), and better lighting intensity and direction for headlights (LED headlights).[179] There are also very important additional benefits of the standards that are not monetized as such in EPA's analysis, such as increased global competitiveness due to the on-going incentive to innovate created by the standards, and

[174] Sanjay Carley, Denvil Duncan, John D. Graham, Saba Siddiki, and Nikolaos Zirogiannis, "A Macroeconomic Study of Federal and State Automotive Regulations", Indiana University School of Public and Environmental Affairs, March 2017. Automotive industry sponsorship is recognized in the acknowledgments on the study's title page. Minor corrections to some calculations, released by the authors after the March 2017 publication, do not affect their overall conclusions.
[175] Comments submitted to the Docket by Synapse Energy Economics, Inc on October 4th, 2017.
[176] *See generally* Draft TAR sec. 4.1.3.
[177] Proposed Determination, App. A, at A-39.
[178] Proposed Determination TSD at 4-9.
[179] Proposed Determination TSD at 4-11- 4-12.

regulatory certainty that further promotes investment in innovative technologies.[180] These actual, recognized, unhidden benefits that EPA chose not to quantify in its cost-benefit analysis add significantly to the benefits of the standards.

The existing record thus strongly supports EPA's determination that there are no adverse consumer impacts from the MY 2022-2025 standards that justify a conclusion that the standards are inappropriate. There are also no subsequent developments that would change this well-supported conclusion.

c. The Auto Industry Has Made a Dramatic Return to Profitability and Added Jobs

During the height of the economic recession in 2008, the American auto industry was on the verge of collapse. This prompted the Obama Administration to develop a bailout package for the industry, which provided the boost the industry needed to help rebound.[181]

Today, the auto industry has returned to profitability at the same time fleetwide fuel economy has climbed to its highest level ever (see Figure 4 below). Drivers in the United States bought more cars in 2016 than ever before – setting a record sales high for the seventh year in a row.[182]

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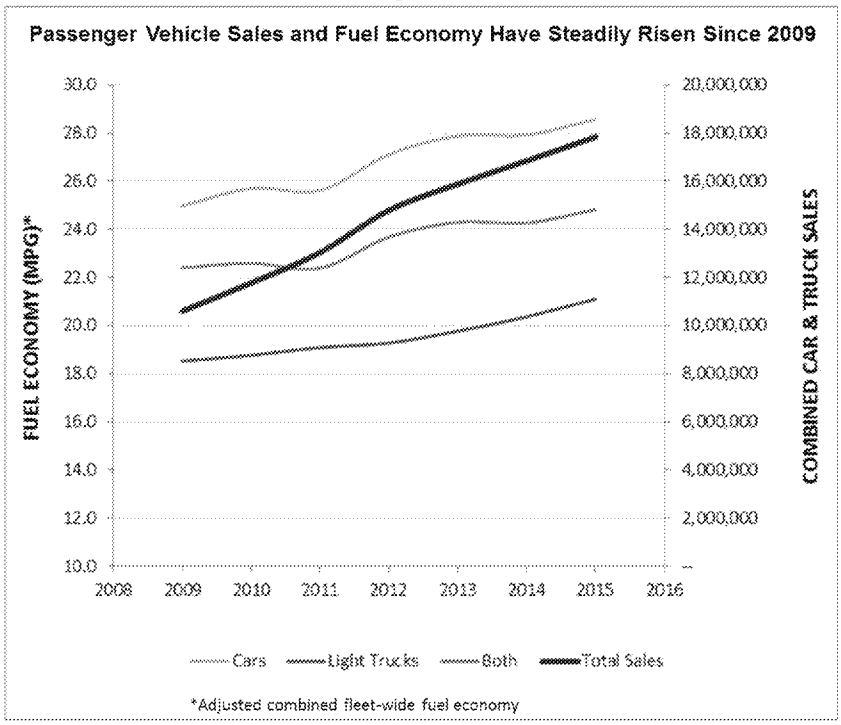
[180] Final Determination RTC at 130.
[181] The Resurgence of the American Automotive Industry, Whitehouse.gov (June, 2011) *available at* https://obamawhitehouse.archives.gov/sites/default/files/uploads/auto_report_06_01_11.pdf (last accessed Oct. 3, 2017).
[182] Garcia, Car Sales Set Another U.S. Record, *supra note 81.*

Figure 4



Source: Created by EDF from data available from Wards Auto[183] and the EPA Fuel Economy Trends Report[184]

During its return to profitability the auto industry also added jobs. Since the recession, overall job growth in the industry has been strong, aiding a recovery of domestic manufacturing as a whole. The U.S. auto industry has added nearly 700,000 direct jobs since the low point of the recession in mid-2009 – and these jobs support several million indirect jobs throughout the economy.[185] The growth in direct jobs includes more than 300,000 added jobs in motor vehicle and parts manufacturing and 380,000 added jobs at auto dealers.[186] This brings total manufacturing employment in the industry to 930,000 – representing nearly 50 percent growth since 2009, and bringing employment at auto and parts dealers to 2 million, which is its highest level ever. Indeed, auto-manufacturing jobs accounted for 40 percent of all net jobs added in U.S. manufacturing since the recession.[187]

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[183] *See* Data Center, WARD'S AUTO, *available at* http://www.WardsAuto.com/data-center (last visited Oct. 4, 2017) (including datasets on U.S. light vehicle sales).
[184] *See* 2016 Fuel Economy Trends Report, *supra* n.96.
[185] BlueGreen Alliance, *Supplying Ingenuity II: U.S. Suppliers of Key Clean, Fuel-Efficient Vehicle Technologies*, at 5 (May 2017), *available at* https://www.bluegreenalliance.org/resources/supplying-ingenuity-ii-u-s-suppliers-of-key-clean-fuel-efficient-vehicle-technologies/ (citing underlying data from U.S. Bureau of Labor Statistics, https://www.bls.gov/iag/tgs/iagauto.htm).
[186] *Id.*; BlueGreen Alliance, *Backgrounder: Sound Vehicle Standards & Policies Drive Strong Job Growth* (June 2016), *available at* https://www.bluegreenalliance.org/resources/sound-vehicle-standards-policies-drive-strong-job-growth/ (last accessed Oct. 3, 2017).
[187] *Id.*

A recent study by the BlueGreen Alliance found that nationwide, there are over 1,200 facilities in 48 states specifically building the technology that increases fuel economy and cuts emissions.[188] And those facilities support hundreds of thousands of manufacturing jobs – including nearly 100,000 in Michigan and Ohio alone.[189]

For example, Ford's F-150, one of the best-selling pickup trucks in America, has led to additional jobs across the automotive supply chain. Ford reports that the MY2015 F-150 is more powerful than earlier models.[190] It also gets an average of 21 percent better fuel economy and uses 17 percent less fuel compared to 2010 models that were built before the current standards took effect.[191] The fuel economy savings from just the new F-150s sold since 2011 save 5 million barrels of oil a year and cut carbon emissions by 2.3 million metric tons.[192]

As part of achieving the first phase in fuel economy standards, Ford developed and deployed a number of new technologies, including its "EcoBoost" line of redesigned engines. And for the second phase of standards Ford is using innovative design and materials—advanced high-strength steels and high-strength military-grade aluminum—to make its F-150 lighter and stronger. Emissions gains have also come from suppliers of more efficient components, like advanced electrical steering (EPS) systems.

An analysis by the BlueGreen Alliance summarized some of the jobs that Ford has supported through its innovation in the F-150.[193]

- Cleveland, Ohio: Ford's Engine Plant No. 1 employs 1,600 people
- Saginaw County, Michigan: Nexteer, supplier of EPS system, employs 5,000 people, largest employer in the county, after coming back from bankruptcy.
- Alcoa, Tennessee: Alcoa, aluminum producer, invested $275 million and added 200 jobs to expand its rolling mill.
- Davenport, Iowa: Alcoa, invested $300 million in facility where the aluminum is further customized to facilitate bonding between aluminum components.
- Dearborn, Michigan and Kansas City: Ford's Truck Plant and Assembly plant, invested $1.1 billion and added 900 workers before any aluminum body trucks could roll off the line. Kansas City Assembly, represented by United Autoworkers (UAW) Local 249, currently employs 6,450 hourly employees, the highest ever since the plant opened in 1951.

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[188] BlueGreen Alliance, *Supplying Ingenuity II*, *supra* n.185, at 4.
[189] *Id.*
[190] BlueGreen Alliance, Combating Climate Change, *supra* n.134.
[191] *Id.*
[192] *Id.*
[193] *Id.*

- Cleveland, Ohio: ArcelorMittal, steel mill, employs 1,900 people today after being mothballed in 2009.

There are also numerous other signs of economic health in the auto industry. The granting of patents by the United States Patent and Trademark Office (PTO) is often cited as a measure of inventive economic activity. The Clean Energy Patent Growth Index (CEPGI), published quarterly by the Cleantech Group at Heslin Rothenberg Farley & Mesiti P.C. provides an indication of the trend of innovative activity in the Clean Energy sector from 2002 to the present. The CEPGI tracks the granting of U.S. patents for the following sub-components: Solar, Wind, Hybrid/Electric Vehicles, Fuel Cells, Hydroelectric, Tidal/Wave, Geothermal, Biomass/Biofuels and other clean renewable energy. In 2015, Hybrid/Electric Vehicle (HEV) technologies grew more than all others with a 30 percent increase in patents over 2014. HEV technologies were granted nearly 700 patents and fuel cell technologies were awarded more than 800 patents. The majority of these patents were granted to large automakers, including Toyota, GM, Honda and Ford.[194]

Exports are also up. Factories in the US exported 2.1 million cars in 2015 – the highest number ever. About half of those went to Canada and Mexico, with other exports going to Asia and the Middle East.[195] In fact, Honda is shipping more models out of the country than it imports.[196] And some automakers are expanding production to meet greater demand abroad.

Finally, there is broad support for rigorous greenhouse gas standards by the labor community. Here are some quotes in support of the Phase 2 standards:

- "Finally, we urge the incoming Trump Administration and the 115th Congress to maintain our nation's commitment to improving fuel efficiency and reducing emissions. The basic structure and design of the One National Program was carefully constructed by a wide array of stakeholders and should be kept intact and not dramatically altered. We cannot afford to go back to the drawing board. Our competitors around the globe are working to strengthen environmental standards and it would be counterproductive to enact policies that provide disincentives for investing in advanced technologies and improving efficiency. History has taught us that a diverse fleet is essential for strong export sales and keeping jobs in the United States. Efficiency and emission standards can and must continue to be a win-win for the environment, working families, domestic manufacturing and the overall economy. The

[194] Clean Energy Patent Growth Index (CEPGI) - 2015 Year in Review, CLEANTECH GROUP AT HRFM (Oct. 31, 2016), *available at* http://www.cepgi.com/2016/10/cepgi_2015_year_in_review.html (last accessed Oct. 4, 2017).
[195] Christina Rogers, U.S. Car Exports Top 2 Million, WALL STREET JOURNAL (Feb. 5, 2015) *available at* https://www.wsj.com/articles/u-s-car-exports-top-2-million-1423174695 (last accessed October 4, 2017).
[196] *See* Jeffrey N. Ross, "Honda is first Japanese carmaker to be a net-exporter from US," AUTOBLOG (Jan. 29, 2014), available at http://www.autoblog.com/2014/01/29/honda-first-japanese-carmaker-net-exporter-from-us.

need to address climate change is real and urgent. We must act to protect our future and the future of our children and grandchildren. There is no scientific debate on the connection between fossil fuel consumption, rising carbon dioxide levels in the earth's atmosphere, and climate change. Climate change is real and we ignore it at our own peril. The need for a comprehensive strategy to address climate change could not be clearer and we all have responsibility to act." - United Auto Workers[197]

- "These new standards will help propel the auto industry forward by giving American families long-term relief from volatile fuel prices. Lowering the total cost of driving will make automobiles more affordable and expand the market for new vehicles." "The standards will also provide certainty for manufacturers in planning their investments and creating jobs in the auto industry as they add more fuel-saving technology to their vehicles. Bringing this additional content to market requires more engineers and more factory workers, expanding employment in the industry." - Bob King, President, United Auto Workers[198]

- "America's landmark fuel economy standards are working. These well-crafted standards, working hand-in-hand with sound manufacturing policy, have shown that the nation can lead in combating climate change while rebuilding American jobs and manufacturing. These environmental and economic objectives remain critical. These standards have helped to deeply reduce carbon emissions, saved consumers money and fuel, and spurred innovation and investment across all types of vehicles and components—creating job growth and developing a more robust and innovative supply chain across the industry." - BlueGreen Alliance[199]

- At a September 2017 public hearing United Steel Workers leaders urged EPA to retain strong fuel economy standards for model year 2022-2025 light-duty cars, trucks, and SUVs to protect the jobs of thousands of Ohio workers building components for today's rapidly innovating auto industry:
    - "As president of Local 2, I represent workers building cutting-edge technologies that are helping to make our light-duty cars, trucks, and SUVs cleaner than ever. We are part of a much larger group of workers that have benefitted from these clean car standards." Jack Hefner, President of USW Local 2 represents members in Akron at Maxion Wheels, Goodyear, and other automotive industry suppliers.[200]

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[197] https://www.regulations.gov/document?D=EPA-HQ-OAR-2015-0827-6155
[198] http://region1a.uaw.org/index.cfm?action=article&articleID=941098a7-2e56-4a4c-b494-f1ef04aad585
[199] https://www.bluegreenalliance.org/the-latest/bluegreen-alliance-welcomes-release-of-technical-assessment-report/
[200] https://www.bluegreenalliance.org/the-latest/congressman-ryan-joined-usw-leaders-in-akron-to-discuss-their-upcoming-testimony-in-washington-dc-on-keeping-fuel-economy-standards-and-ohio-manufacturing-strong/

- "Today's fuel economy standards are proof that sound regulations can go hand in hand with making manufacturing thrive. Ohio and auto sector are proving you can build jobs while cutting pollution and enhancing energy security." Dan Boone, President of USW Local 979 represents members at the ArcelorMittal plant in Cleveland, one of most innovative and productive steel mills in the world that makes lighter, stronger steel primarily for cleaner vehicles.[201]

d. Clean car standards will continue to benefit and protect automakers, parts suppliers and workers

In addition to the current robust economic health of the auto industry, there is also strong evidence that automakers and their parts suppliers will continue to make profits under the future Clean Car standards and will be better safeguarded against fuel price shocks. And market stability translates into employment stability for American autoworkers.

In a 2016 analysis, Ceres forecast automaker pretax profits under 5 different fuel price scenarios under the recently affirmed 2022-2025 standards. They concluded that the top 3 U.S. manufacturers (Ford, GM and Chrysler) will be profitable under the current standards in all fuel price scenarios in the study, including the "very low" price scenario. They also found that U.S. automakers will be able to fully recover their compliance costs at any fuel price above the Energy Information Administration's long term forecasted "low price".[202]

Suppliers too stand to gain from the 2022-2025 standards. Suppliers make up a significantly larger portion of the U.S. economy and of U.S. employment than do the automakers. In April 2016, automakers employed 214,700 people in the U.S., while makers of auto parts employed 564,100 – or 2.6 times as many. Stronger standards lead to increased supplier revenue because as much as 80 percent of automaker compliance investments are paid to suppliers of fuel-saving technologies. And the regulatory certainty of maintaining the current standards is especially valuable to the suppliers making the majority of fuel-saving technology investments in research, development, and production capacity.[203]

In addition to supporting industry profits, studies have shown that fuel efficiency standards insulate the auto market from fuel price shocks – and that market stability translates into

[201] *Id.*
[202] Baum, Alan & Dan Luria, ANALYST BRIEF: Economic Implications of the Current National Program v. a Weakened National Program in 2022-2025 for Detroit Three Automakers and Tier One Suppliers, CERES (Jun. 27, 2016), *available at* https://www.ceres.org/resources/reports/economic-implications-current-national-program-v-weakened-national-program-2022.
[203] *Id.*

employment stability. In a marketplace without standards, not all manufacturers produce fuel-efficient models. For example, the U.S. automakers relied heavily on less efficient vehicle lines before the Clean Car standards began in 2012. When fuel prices spike in the absence of fuel economy standards, more fuel-efficient vehicles are in greater demand, shifting demand across manufacturers and disrupting sales and employment. Recent peer-reviewed research suggests that fuel-economy and GHG standards have led U.S. automakers to offer more diverse sets of products that are competitive under a wider range of fuel prices, making them better positioned to manage significant fuel price swings.[204] For autoworkers and parts manufacturing workers, strong standards safeguard the industry against negative impacts associated with unanticipated changes in the price of fuel, which could otherwise lead to layoffs and lost wages.

To evaluate whether the current fuel economy and GHG standards are a cost effective hedge (i.e. a correctly priced insurance policy) against future fuel price spikes, Ceres estimated the net losses of weakened standards in the event of a price spike. The analysis concluded that profits by the three largest U.S. automakers (Ford, GM and Chrysler) from U.S. new vehicle sales would plummet more than $1 billion per year in response to fuel price shocks without the Clean Cars program.[205] And because as much as 80 percent of automaker compliance costs are paid to suppliers of fuel-saving technologies, suppliers could lose up to $1.42 billion in the case of a fuel price shock. [206] This could put many American jobs at risk. Alternatively, Ceres also concluded that the U.S. automakers stand to make significant profits under the Clean Cars program, even with low fuel prices, as discussed above.[207]

e. Clean car standards help ensure that automakers retain their global competiveness

The Clean Car standards are essential to ensuring that the resurgence for U.S. automakers endures, and that American autoworkers have a strong position in the years ahead. The strong fuel economy and GHG standards have led U.S. automakers to offer a more diverse and more efficient set of vehicles. As a result, their fleets will remain attractive to consumers in the years ahead, even if fuel prices spike again.[208]

Strong fuel economy and GHG standards are essential if the American auto sector is going to keep pace with global trends. Many other nations have adopted fuel economy and GHG emissions standards through 2025 that will drive improved passenger vehicle efficiency in line with the U.S., while some nations are planning to go farther faster. This includes a range of

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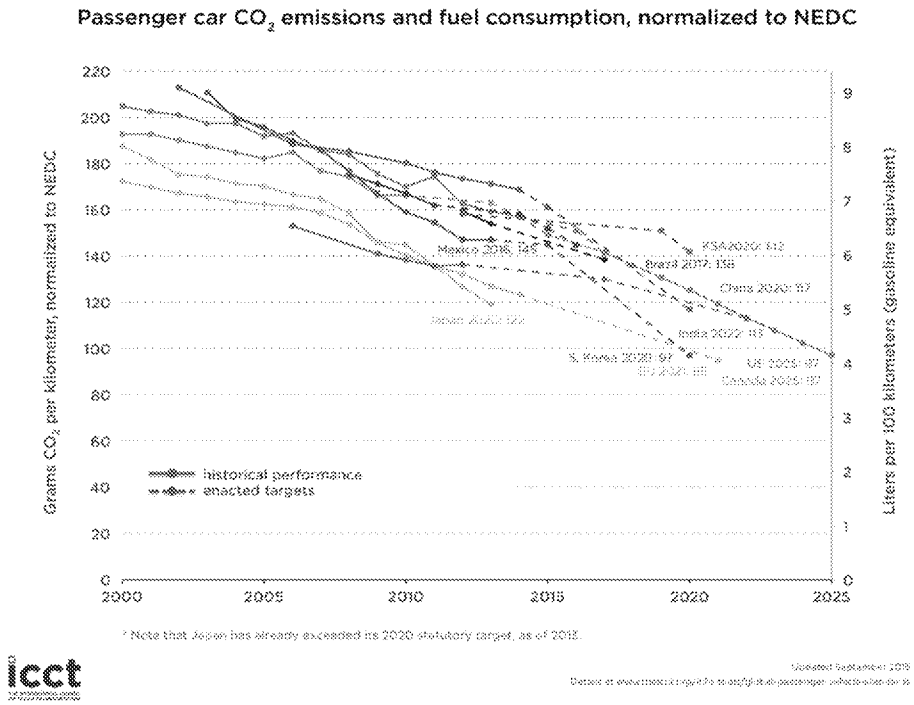
[204] Busse et al., *supra* n. 165.
[205] Baum et al., *supra* n.202.
[206] *Id.*
[207] *Id.*
[208] Busse et. al., *supra* n. 165.

developed and developing countries, including: Canada,[209] the European Union[210], China,[211] India[212] and South Korea[213] (see Figure 5 below). And China – which is seeing the largest market growth worldwide – will force foreign carmakers to start manufacturing electric vehicles in 2019. U.S. automakers who intend to export cars to China will have to earn points from electric vehicles and hybrids equivalent to 10% of vehicles they import into the country and that rises to 12% in 2020.[214]

Figure 5



Source: ICCT, *See* http://www.theicct.org/sctp-ldv-e

[209] Fact Sheet: Canada, Light Duty Vehicle Efficiency Standards, *available at* http://www.theicct.org/sites/default/files/info-tools/pvstds/Canada_PVstds-facts_jan2015.pdf (last accessed Oct. 4, 2017).
[210] EU Light Duty: GHG Emissions, TransportPolicy.net, *available at* http://www.transportpolicy.net/index.php?title=EU:_Light-duty:_GHG (last accessed Oct. 4, 2017).
[211] China: Light Duty Fuel Consumption, TransportPolicy.net, *available at* http://www.transportpolicy.net/index.php?title=China:_Light-duty:_Fuel_Consumption (last accessed Oct. 4, 2017).
[212] India: Light-Duty: Fuel Consumption, TransportPolicy.net, *available at* http://transportpolicy.net/index.php?title=India:_Light-duty:_Fuel_Consumption (last accessed Oct. 4, 2017).
[213] South Korea: Light Duty: Fuel Consumption and GHG, TransportPolicy.net, *available at* http://transportpolicy.net/index.php?title=South_Korea:_Light-duty:_Fuel_Economy_and_GHG (last accessed Oct. 4, 2017).
[214] China Sets New deadline for Electric-Car Production, DOW JONES NEWSWIRES (Sept. 28, 2017) *available at* http://www.foxbusiness.com/markets/2017/09/28/china-sets-new-deadline-for-electric-car-production.html (last accessed Oct. 4, 2017).

Looking past 2025, many nations have made commitments to fully phase out the combustion engine over the next couple of decades. Britain and France announced that they would end the sale of gas and diesel-powered vehicles by 2040.[215] Scotland pledged to phase out new petrol and diesel cars and vans by 2032, eight years ahead of the UK target.[216] India is making a vow to start selling only electric cars by 2030. The government's National Electric Mobility Mission Plan wants annual sales of electric and hybrid cars to hit 6 million to 7 million by 2020.[217] Norway set a target that all new passenger cars and vans sold in 2025 should be zero-emission vehicles. The country is considered a leader in this area. About 40% of all cars sold in the country last year were electric or hybrid vehicles.[218] Austria, China, Denmark, Germany, Ireland, Japan, the Netherlands, Portugal, Korea and Spain have set official targets for electric car sales.[219] Any backtracking on the current 2025 standards would therefore risk leaving U.S. manufacturers behind.

IV. EPA must fully account for non-GHG benefits

All of EPA and NHTSA's recent joint GHG and fuel efficiency actions affecting light-duty and heavy-duty vehicles will also deliver important non-GHG co-benefits by reducing harmful criteria pollutants including volatile organic compounds (VOC), oxides of nitrogen (NOx), fine particulate matter (PM2.5) and sulfur oxides (SOx), as well as deadly air toxics—even beyond what is required from the parallel 2017-2025 California LEV3/US EPA Tier 3 standards. These reductions will save lives in communities across the nation as well as help states and local communities who rely on contributions from these federal programs to reach air quality attainment goals. Both NHTSA and EPA completed a careful assessment of co-benefits in the previous Phase 1 and Phase 2 joint rules and must do so for any future action.

EPA has requested comment on the appropriateness of the MY2021 standards.[220] As discussed at length below, EDF strongly opposes any reconsideration of the appropriateness of the MY 2021 standards as they are not at all part of the midterm evaluation.

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[215] Stephen Castle, Britain to Ban New Diesel and Gas Cars by 2040, N.Y. TIMES (July 26, 2017) *available at* https://www.nytimes.com/2017/07/26/world/europe/uk-diesel-petrol-emissions.html (last accessed Oct. 4, 2017).
[216] Shehab Khan, Scotland to 'Phase Out' New Petrol and Diesel Cars by 2032, INDEPENDENT.UK, (Sept. 5, 2017) *available at* http://www.independent.co.uk/news/uk/politics/scotland-petrol-diesel-cars-phase-out-ban-2032-nicola-sturgeon-snp-environment-air-pollution-a7930781.html (last accessed Oct. 4, 2017).
[217] Jackie Wattles, India to Sell Only Electric Cars by 2030, CNN.com (June 3, 2017) *available at* http://money.cnn.com/2017/06/03/technology/future/india-electric-cars/index.html?iid=EL (last accessed Oct. 4, 2017).
[218] Alanna Petroff, These Countries Want to Ditch Gas and Diesel Cars (July 26, 2017) *available at* http://money.cnn.com/2017/07/26/autos/countries-that-are-banning-gas-cars-for-electric/index.html (last accessed Oct. 4, 2017).
[219] *Id.*; IEA, Global EV Outlook (2017) see https://www.iea.org/publications/freepublications/publication/global-ev-outlook-2017.html (last visited October 4, 2017).
[220] EPA Request for Comment, 82 Fed. Reg. at 39,553.

However, to further illustrate the benefits of the MY2021 standards and the MY2022-2025 standards, EDF conducted an analysis to quantify the potential clean air benefits that are at risk if EPA reconsiders the MY2021 standards or proposes weaken the MY2022-2025 standards. The emission impacts were estimated using the most recent version of EPA's Inventory Costs and Benefits Tool (ICBT) benefits model, which was developed for the Final Determination.[221] Our study examined two scenarios: a scenario that assumes that the 2020 greenhouse gas standards for light-duty vehicles are extended indefinitely, completely rolling back the final MY2021 and MY2022-2025 standards; and a scenario that reduces the degree of emission control achieved by the 2025 standards by 50 percent.[222] Both of these scenarios are relative to EPA's final 2025 standards. The results are presented in Table 4 and 5 below.[223]

Table 4 presents the emission impacts for the extreme and indefensible scenario where EPA rolls back the final MY2021-2025 standards and instead extends the MY2020 standards indefinitely. Table 5 provides the results for the scenario where the MY2025 standards are reduced by 50 percent. As can be seen from the tables, the lost reductions in VOC, NOx and PM2.5 are very consequential under both scenarios, especially in the out years as the fleet turns over. (CO_2 lost reductions are also shown in both tables for completeness.)

Table 4: Nationwide Lost Emissions Reductions if MY2020 Standards Are Extended Indefinitely – Relative to Final MY2025 Standards

Calendar Year	CO2e (thousand Metric tons per year)	VOC (US tons per year)	NOx (US tons per year)	PM2.5 (US tons per year)
2021	6,830	3,864	1,051	168
2025	60,241	33,617	9,276	1,458
2030	137,474	76,308	20,899	3,302
2035	198,526	109,781	29,819	4,742
2040	241,510	133,233	36,023	5,746
2045	273,712	150,806	40,702	6,498
2050	303,158	166,924	45,019	7,190

[221] TAR at 12-47.
[222] The standards for MY2021-2024 were adjusted to reflect a constant g/mi CO_2 decrease in the car and truck standards between 2020 and 2025.
[223] A detailed description of the analysis can be found in Appendix A.

Table 5: Nationwide Lost Emissions Reductions if MY2025 Standards Are Weakened by 50% - Relative to Final MY2025 standards				
Calendar Year	CO2e (thousand Metric tons per year)	VOC (US tons per year)	NOx (US tons per year)	PM2.5 (US tons per year)
2021	5,190	2,984	811	130
2025	35,579	20,336	5,585	882
2030	74,992	42,693	11,611	1,846
2035	105,744	59,966	16,167	2,587
2040	127,239	71,996	19,315	3,100
2045	143,721	81,234	21,755	3,495
2050	159,027	89,840	24,044	3,864

These scenarios clearly demonstrate that there are important co-benefits associated with the existing standards and any rollback will be harmful to public health. Many of these important reductions will occur in already overburdened communities, therefore helping to address environmental justice concerns. In addition, the criteria pollutant reductions of the final MY2021-2025 standards are substantial and will be relied upon by states to reach attainment of the ambient air quality standards and to accommodate future growth. For comparison purposes, the 2030 GHG reductions from the MY2021-2025 portion of the program represent about 50% of the total reductions expected from the entire light-duty Phase 2 program. The MY2021-2025 VOC, NOx, and PM2.5 reductions in 2030 are more than 60 percent of the reductions expected from the entire MY2017-2025 program. Compared to the recent light-duty Tier 3 rule, the light-duty Phase 2 program, in the 2030 calendar year, provides VOC reductions that are about 75 percent of those expected from Tier 3, NOx reductions that are about 10 percent of those expected from Tier 3, and PM2.5 reductions that are about 60 percent of those expected from Tier 3.[224] The light-duty Phase 2 program will result in significant GHG and criteria emission reductions and it is imperative that EPA live up to its statutory obligations and continue to fully

[224] Control of Air Pollution From Motor Vehicles: Tier 3 Motor Vehicle Emission and Fuel Standards; Final Rule, 79 Fed. Reg. 23,414, 23,443 (April 28, 2014).

account for the climate pollution impacts and criteria emission health and welfare benefits as it proceeds with its reconsideration of the Final Determination.

V. EPA should consider a lower rebound effect value and include the welfare benefits of the rebound effect

a. EPA should consider a lower rebound effect value

In the 2012 Final Rule for MY2017-2025 standards, the Agencies based the rebound effect value on existing studies and literature and concluded that a 10 percent value was appropriate.[225] During the 2016 Midterm Evaluation, EPA conducted another thorough review of the available literature, including numerous new studies and reviews published since 2012.[226] Based on this new information, EPA determined that the 10 percent rebound effect value continues to be appropriate.

EPA found the body of literature that uses U.S. state- and national-level data, collected over a time period where fuel vehicle fuel efficiency increases, to be the most applicable new work. Based on these new studies, EPA concluded that while there is a wide range of estimates for both the historical magnitude of the rebound effect and its projected future value, there is evidence that the rebound effect is likely declining over time. Taking that into consideration, EPA still determined that the 10 percent rebound value is appropriate because it lies at the bottom of the range of estimates for historical rebound effect and lies at the upper end of the range of estimates for the future rebound effect reported in the newer studies.[227] EPA clearly notes, the 10 percent value "was not derived from a single point estimate from a particular study, but instead represents a reasonable compromise between historical estimates of the rebound effect and forecasts of its projected future value, based on an updated review of the literature on this topic."[228]

A number of studies cited by EPA also concluded that vehicle use is related more to fuel price than vehicle efficiency, and the rebound effect may therefore be overstated. In other words, vehicle owners will drive more as fuel prices drop, not because they have a more efficient vehicle. These results, together with the conclusion that the rebound effect is likely declining

[225] 77 Fed. Reg. 62,624, 62,716, 62,924 (Oct. 15, 2012) (2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards) (referring to the recent work and literature on the rebound effect including Small and Van Dender (2007), Sorell and Dimitropoulos (2007), and Greene (2012)).
[226] U.S. Environmental Protection Agency (EPA), *Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation: Technical Support Document* (2016), at 3-19–3-21.
[227] *Id.* at 3-20.
[228] *Id.* at 3-21.

over time, supports EPA considering a rebound effect value lower than 10 percent during any new evaluation of the MY2022-2025 standards.

b. EPA should include welfare benefits of rebound effect

To the extent EPA retain some positive rebound value, it is important to estimate the beneficial impacts of that rebound effect. As discussed in a 2014 Resources for the Future discussion paper on "The Rebound Effect and Energy Efficiency Policy," rebound often has a misconceived 'evil' connotation because policymakers tend to focus solely on energy minimization (in this case, fuel consumption reduction) and ignore welfare maximization.[229] However, this does not capture the entire impact of rebound because any time a consumer changes his or her behavior (for example, by buying a more efficient car), it means that there is some inherent welfare benefit to that consumer (relative to no change in behavior). It is therefore important that "[r]ather than consider[ing] the rebound effect as a deterrent from passing energy efficiency policies, policymakers should include these welfare gains in the tally of benefits of a policy."[230] EPA correctly accounted for these benefits in the Heavy-duty Phase 2 Greenhouse Gas and Fuel Economy Program and we urge EPA to estimate the benefits of increased travel associated with rebound driving during any reexamination of the light-duty standards.[231]

VI. EPA must not reevaluate MY2021 standards

EPA is requesting comment on whether the greenhouse gas standards for MY2021 are appropriate.[232] Reconsidering the MY2021 standards, which are not at all part of the midterm evaluation but instead final under both EPA and NHTSA's final 2012 rulemakings, is wholly inconsistent with the record.

Thirteen auto companies representing over 90 percent of U.S. vehicle sales sent commitment letters to both EPA's Administrator and the Secretary of DOT that expressed, in detail, their support for the proposal and adoption of the MY2017-2025 fuel economy and GHG standards.[233] The automakers and others supported the MY2017-2021 standards fully. While a midterm review was agreed upon as a procedural component of the MY2022-2025 standards, no such provision was made for the MY2017-2021 standards. Nowhere in the rulemaking record is there a mention that a review of the appropriateness of the MY2021 standards would or could be part of EPA's midterm review.[234] An unplanned review of the MY2021 standards it is not justified by

[229] Gillingham, *et al.*, *The Rebound Effect and Energy Efficiency Policy, Resources for the Future Discussion Paper,* 2014 RFF DP 14-39, forthcoming in the Review of Environmental Economics and Policy, (in press).
[230] *Id.*
[231] 80 Fed. Reg. (July 13, 2015) at 40474.
[232] EPA 2017 Request for Comment, 82 Fed. Reg. at 39,553.
[233] EPA Regulatory Announcement at 2.
[234] 2012 Final Rule, 77 Fed. Reg. at 62,628, 62,652, & 62,785.

the record and would also harmfully disadvantage the companies that have wisely and appropriately invested for compliance, in reliance on the 2012 final rule.

Moreover, the existing record is extensive and rigorous and firmly supports maintaining or strengthening EPA's standards for MY2022-2025 as well as MY2021. As we detail elsewhere in these comments, technologies that will support compliance are being introduced faster and at lower cost than expected. Neither the auto manufacturers nor the agencies—nor any other parties—have publicly raised any concerns regarding the feasibility of the MY2021 standards during the 2012 rulemaking or during the midterm evaluation process. In fact, automakers are already developing plans for introduction of compliant MY2021 vehicles, as their introduction could occur as early as January 2020.

It is inexplicable that EPA has raised MY2021 in the context of the midterm evaluation process. There is no justification for revisiting the feasibility of the MY2021 standards. EPA has provided no rationale for questioning the appropriateness of the MY2021 standards, and should abandon any reconsideration of these standards.

VII. Conclusion

The existing record firmly supports EPA's final determination that the existing MY2022-2025 standards remain "appropriate" under Clean Air Act Section 202(a)(1) and that, if anything, they should be strengthened. We appreciate the opportunity to submit these comments.

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VIII. List of Attachments

A. **Analysis of Manufacturers' Banked GHG Credits**
B. **Effect of Lower Technology Costs on Compliance Costs**
C. **Emissions Impact of Relaxed Fuel Economy and GHG Emission Standards**
D. **Comparison of EPA vs. NHTSA peer reviewed papers**
E. **EDF comments on CAR analysis**
F. **Industry Announcements**

Attachment A – Analysis of Manufacturers' Banked GHG Credits

EPA publishes a report each model year, which describes the average GHG emissions level for cars and light trucks for each manufacturer.[235] This report also presents the level of credits accrued by each manufacturer at the beginning of the model year, its generation or use of credits during the model year, and the manufacturer's bank of credits at the end of the model year. At the end of the 2015 model year, the most recent year for which such data is available, manufacturers had 286 megagrams (Mg) of GHG credits. Table 1 shows each manufacturer's credit bank.[236]

Table 1: GHG Credit Bank Levels at the End of the 2015 Model Year (Mg)	
Manufacturer	Credits as of end of 2015 model year
Toyota	82,996,367
Honda	38,347,521
GM	31,060,500
Ford	30,604,147
Nissan	24,561,976
FCA	21,918,309
Hyundai	20,338,163
Subaru	13,281,040

[235] GHG Emission Standards for Light-Duty Vehicles: Manufacturer Performance report for the 2015 Model Year," EPA-420-R-16-014, November 2016.
[236] *Id.*

Kia	8,173,661
Mazda	8,180,592
BMW	3,558,682
Mitsubishi	1,681,499
Mercedes	629,434
Suzuki	428,242
Fisker	46,694
BYD Motors	4,824
Tesla	576
Coda	-
Volvo	-
JLR	(288,555)
Total	285,523,672

This analysis estimates how many additional years of compliance these banked credits would facilitate if the manufacturers took no action to improve the GHG emission levels of their vehicles beyond those already reflected in the 2015 MY levels. This static baseline does not reflect reality, as manufacturers will indeed improve emissions performance over the coming years. Instead, it is illustrative and meant to demonstrate how manufacturers' investments in technologies to reduce greenhouse gas emissions has created substantial credits that only further underscores the feasibility of compliance with MY 2022-25 standards.

As inputs, this analysis uses two-cycle GHG emission levels from 2624 vehicle models comprising the 2015 MY baseline fleet that EPA used as the basis for its OMEGA model runs in the Final Determination. It also utilizes sales by model year in 2015, as well as sales projected for these vehicle models for 2016 and later model years. Finally, it utilizes the levels of several types of GHG credits generated by the 2015 MY fleet – flexible fuel vehicle, off-cycle and air conditioning credits. Tables 2 and 3 show total car and truck sales, respectively, by manufacturer for the 2015-2019 MYs.[237]

[237] 2015-2025 Production Summary and Data with Definitions.xlsx file distributed with the publication of EPA's Proposed Determination.

Table 2: Actual 2015 MY Sales and Projected 2016-19 MY Sales – Passenger Cars				
Manufacturer	2015	2016	2017	2018
BMW	338,704	305,958	301,828	292,613
FCA	769,687	523,640	549,800	522,970
Ford	888,604	804,053	757,567	767,211
GM	1,331,442	1,127,719	1,159,308	1,186,377
Honda	1,020,310	842,666	859,705	836,674
Hyundai/Kia	1,228,399	1,085,772	1,091,102	1,122,263
JLR	15,600	17,735	23,991	23,507
Mazda	207,100	223,721	219,724	210,463
Mercedes	231,899	208,815	215,100	210,294
Mitsubishi	91,822	53,837	53,337	50,730
Nissan	1,216,392	777,693	785,238	779,414
Subaru	175,352	149,711	159,756	154,848
Tesla	24,322	24,953	40,824	71,192
Toyota	1,524,190	1,336,530	1,273,754	1,239,732
Volkswagen	487,108	377,421	448,865	510,824
Volvo	42,616	32,912	36,683	39,411
Total	9,593,547	7,893,138	7,976,582	8,018,524

Table 3: Actual 2015 MY Sales and Projected 2016-19 MY Sales – Light Trucks				
Manufacturer	2015	2016	2017	2018
BMW	87,135	134,773	132,625	139,918
FCA	1,416,487	1,520,796	1,651,119	1,550,302

Ford	972,891	1,367,996	1,376,266	1,337,170
GM	1,525,017	1,576,316	1,540,406	1,490,902
Honda	556,864	940,887	936,118	936,482
Hyundai/Kia	91,058	203,835	202,806	227,242
JLR	54,435	91,742	107,018	113,420
Mazda	78,793	166,302	164,887	151,403
Mercedes	123,727	191,133	200,301	189,299
Mitsubishi	39,366	48,164	50,526	45,270
Nissan	481,583	679,042	699,899	672,769
Subaru	447,383	650,700	641,207	682,764
Tesla	-	-	-	-
Toyota	1,127,056	1,337,299	1,368,116	1,251,279
Volkswagen	112,382	136,239	243,466	277,560
Volvo	24,284	49,505	47,056	49,723
Total	7,138,461	9,094,729	9,361,816	9,115,505

This data likewise contain two-cycle GHG emission levels for each of the 2425 vehicle models in the 2015 MY. Sales-weighting these 2015 emission levels for 2015-2019 produces the average GHG emission levels by manufacturer for cars and trucks shown in Tables 4 and 5.

Table 4: Average Two-Cycle CO2 Emissions by Manufacturer and Model Year – Passenger Cars (g/mi)				
Manufacturer	2015	2016	2017	2018
BMW	256	252	251	250
FCA	275	280	282	283
Ford	258	258	259	259
GM	266	264	265	268
Honda	217	218	218	218

Hyundai/Kia	253	249	249	249
JLR	337	332	329	329
Mazda	217	222	222	221
Mercedes	273	270	271	271
Mitsubishi	215	222	225	226
Nissan	217	218	220	223
Subaru	242	242	243	243
Tesla	0	0	0	0
Toyota	225	222	223	223
Volkswagen	251	258	258	261
Volvo	254	256	258	257
Fleet-Average	243	243	243	244

Table 5: Average Two-Cycle CO2 Emissions by Manufacturer and Model Year – Light Trucks (g/mi)				
Manufacturer	2015	2016	2017	2018
BMW	316	314	314	315
FCA	354	356	352	352
Ford	353	350	352	350
GM	362	359	359	360
Honda	283	283	286	288
Hyundai/Kia	326	320	320	318
JLR	358	356	358	353
Mazda	285	286	288	288
Mercedes	347	353	352	350

Mitsubishi	254	255	255	255
Nissan	307	308	310	311
Subaru	247	246	246	246
Tesla	0	0	0	0
Toyota	342	339	339	340
Volkswagen	336	334	337	333
Volvo	333	334	334	334
Fleet-Average	336	331	331	330

The EPA 2015 MY Performance Report shows the amount of credits earned by each manufacturer in 2015. These credits, shown in Tables 6 and 7, are in grams per mile (g/mi) averaged across each manufacturer's car and light truck sales, respectively. The off-cycle, air conditioning credits and methane and nitrous oxide emission deficits which manufacturer earned in 2015 are assumed to continue without change in future model years. However, flexible fuel vehicle (FFV) credits will no longer be able to be earned starting with the 2016 MY. Thus, these are applicable to compliance in 2015, but not assumed to be earned in future model years.

Table 6: Credits Earned in 2015 MY by Manufacturer– Passenger Cars (g/mi)				
Manufacturer	FFV	Air Conditioning	Off-Cycle	Methane/Nitrous Oxide
BMW		9	3.5	-0.2
FCA	9	17	3.3	
Ford	8	9	3.9	-0.1
GM	8	10	2.1	
Honda		3	1.4	-0.1
Hyundai/Kia		5	1.2	
JLR	13	14	2.5	
Mazda				
Mercedes	6	11		
Mitsubishi				

Nissan		7	1.6	-0.3
Subaru		3	0.2	
Tesla		6		
Toyota		8	2.3	
Volkswagen	7	9		
Volvo		8		

Table 7: Credits Earned in 2015 MY by Manufacturer – Light Trucks (g/mi)				
Manufacturer	FFV	Air Conditioning	Off-Cycle	Methane/Nitrous Oxide
BMW		11	6.5	-1.5
FCA	15	19	7.5	
Ford	15	11	6.9	-0.3
GM	15	11	3.7	
Honda		6	1.7	-0.6
Hyundai/Kia		6	2.6	
JLR	15	23	5.5	
Mazda				
Mercedes	5	12		
Mitsubishi				
Nissan	6	8	2.9	-1.3
Subaru		2	0.2	
Tesla				
Toyota	8	8	2.7	
Volkswagen	13	12		
Volvo		9		

Tables 8 and 9 show GHG compliance values by model year and manufacturer for cars and light trucks, respectively. These were determined by subtracting the credits and adding the deficits from Tables 6 and 7 to the two-cycle CO2 emission levels shown in Tables 4 and 5.

Table 8: Average GHG Compliance Values by Manufacturer and Model Year – Passenger Cars (g/mi)

Manufacturer	2015	2016	2017	2018
BMW	244	240	239	238
FCA	246	260	262	263
Ford	237	245	246	247
GM	246	251	253	256
Honda	213	213	214	214
Hyundai/Kia	246	243	242	243
JLR	308	315	312	312
Mazda	217	222	222	221
Mercedes	256	259	260	260
Mitsubishi	215	222	225	226
Nissan	209	209	211	215
Subaru	238	239	240	240
Tesla	-6	-6	-6	-6
Toyota	215	211	213	213
Volkswagen	235	249	249	252
Volvo	246	248	250	249
Fleet-Average	230	233	234	234

Table 9: Average GHG Compliance Values by Manufacturer and Model Year – Light Trucks (g/mi)

Manufacturer	2015	2016	2017	2018

BMW	300	298	298	299
FCA	312	330	326	326
Ford	321	333	334	332
GM	332	345	345	345
Honda	276	276	279	281
Hyundai/Kia	317	311	311	309
JLR	314	328	330	325
Mazda	285	286	288	288
Mercedes	330	341	340	338
Mitsubishi	254	255	255	255
Nissan	291	299	301	301
Subaru	245	244	244	244
Tesla	0	0	0	0
Toyota	323	328	328	330
Volkswagen	311	322	325	321
Volvo	324	325	325	325
Fleet-Average	311	317	317	316

The GHG standards vary for each vehicle model based on the footprint of the vehicle and whether it is a passenger car or light truck. The GHG standards were determined for each vehicle model in EPA's 2015 baseline fleet and sales-weighted across vehicle class and manufacturer for the 2015-2019 model years. The resultant corporate average standards are shown in Tables 10 and 11.

Table 10: Corporate Average GHG Standards by Manufacturer and Model Year –Pas. Cars (g/mi)				
Manufacturer	2015	2016	2017	2018
BMW	244	234	221	210
FCA	247	237	225	214

Ford	244	234	222	211
GM	244	233	220	209
Honda	236	225	213	202
Hyundai/Kia	243	231	218	207
JLR	257	243	230	220
Mazda	241	229	217	206
Mercedes	249	236	223	212
Mitsubishi	225	214	203	193
Nissan	239	227	214	204
Subaru	234	223	210	200
Tesla	276	266	252	240
Toyota	239	228	216	206
Volkswagen	236	226	213	203
Volvo	247	236	224	213
Fleet-Average	241	230	218	207

Table 11: Corporate Average GHG Standards by Manufacturer and Model Year – Light Trucks (g/mi)				
Manufacturer	2015	2016	2017	2018
BMW	301	287	285	274
FCA	306	293	289	280
Ford	326	310	309	299
GM	332	317	316	309
Honda	293	278	275	265
Hyundai/Kia	297	279	275	262
JLR	300	285	284	271

Mazda	285	272	269	258
Mercedes	299	288	285	274
Mitsubishi	273	259	253	241
Nissan	301	289	287	276
Subaru	276	262	257	245
Tesla	0	0	0	0
Toyota	306	290	288	279
Volkswagen	297	283	282	266
Volvo	289	275	272	260
Fleet-Average	310	294	291	281

When a manufacturer's GHG compliance level is above its corporate average standard, it must use banked credits to comply with the standard. When a manufacturer's GHG compliance level is below its corporate average standard, it earns credits that are then banked for future use. Credits are expressed in megagrams. To compare compliance surplus or deficit to a manufacturer's banked credits, the analysis converts g/mi to megagrams by by multiplying the compliance delta by the lifetime mileage of either cars or light trucks and dividing by 1,000,000. The lifetime mileage for cars is 195,264 miles and that for light trucks is 225,865. Each manufacturers credit usage for cars, light trucks and cars and light trucks combined is shown in Tables 12, 13, and 14.

Table 12: Credit Usage by Manufacturer and Model Year –Passenger Cars (megagram)				
Manufacturer	2015	2016	2017	2018
BMW	21,775	355,607	1,033,130	1,559,021
FCA	(184,590)	2,328,796	3,938,034	4,963,864
Ford	(1,250,487)	1,650,665	3,539,727	5,376,110
GM	473,554	4,161,345	7,403,410	10,691,890
Honda	(4,521,624)	(1,854,418)	176,436	1,891,407
Hyundai/Kia	656,623	2,515,515	5,160,202	7,785,931
JLR	153,797	252,183	383,918	426,637

Mazda	(965,534)	(322,814)	205,388	619,080
Mercedes	307,684	938,995	1,547,243	1,955,673
Mitsubishi	(164,679)	82,701	222,883	322,531
Nissan	(7,149,537)	(2,701,591)	(450,256)	1,757,670
Subaru	135,147	471,583	922,556	1,219,882
Tesla	(1,341,139)	(1,323,824)	(2,054,322)	(3,414,955)
Toyota	(7,159,358)	(4,347,269)	(837,862)	1,761,286
Volkswagen	(105,893)	1,740,074	3,156,759	4,856,781
Volvo	(7,436)	73,695	185,290	278,844
Total Usage	(21,101,699)	4,021,244	24,532,535	42,051,653

Table 13: Credit Usage by Manufacturer and Model Year – Light Trucks (megagram)				
Manufacturer	2015	2016	2017	2018
BMW	(32,830)	347,739	369,224	777,208
FCA	2,155,763	12,456,909	13,459,499	15,944,295
Ford	(1,215,671)	7,098,041	7,776,484	10,050,896
GM	129,598	9,940,503	10,033,087	12,242,437
Honda	(2,243,022)	(404,901)	854,780	3,472,611
Hyundai/Kia	397,884	1,456,979	1,621,310	2,377,039
JLR	180,393	880,371	1,115,182	1,378,254
Mazda	(6,904)	520,457	689,126	1,035,982
Mercedes	857,510	2,306,573	2,461,675	2,767,450
Mitsubishi	(164,069)	(39,202)	27,812	142,800
Nissan	(1,011,213)	1,519,733	2,153,622	3,749,316
Subaru	(3,131,240)	(2,670,584)	(1,814,089)	(160,240)
Tesla	-	-	-	-

Toyota	4,407,615	11,462,813	12,519,428	14,178,598
Volkswagen	346,573	1,224,817	2,395,218	3,439,535
Volvo	190,998	558,448	560,537	727,536
Total Usage	861,385	46,658,697	54,222,896	72,123,716

Table 14: Credit Usage by Manufacturer and Model Year – Cars and Light Trucks (megagram)				
Manufacturer	2015	2016	2017	2018
BMW	(11,055)	703,346	1,402,354	2,336,229
FCA	1,971,173	14,785,705	17,397,533	20,908,159
Ford	(2,466,158)	8,748,705	11,316,211	15,427,006
GM	603,152	14,101,848	17,436,497	22,934,327
Honda	(6,764,645)	(2,259,319)	1,031,216	5,364,018
Hyundai/Kia	1,054,507	3,972,494	6,781,513	10,162,970
JLR	334,190	1,132,555	1,499,100	1,804,891
Mazda	(972,438)	197,644	894,514	1,655,062
Mercedes	1,165,194	3,245,568	4,008,919	4,723,124
Mitsubishi	(328,748)	43,499	250,696	465,331
Nissan	(8,160,750)	(1,181,858)	1,703,366	5,506,986
Subaru	(2,996,094)	(2,199,001)	(891,533)	1,059,643
Tesla	(1,341,139)	(1,323,824)	(2,054,322)	(3,414,955)
Toyota	(2,751,743)	7,115,543	11,681,565	15,939,884
Volkswagen	240,680	2,964,891	5,551,976	8,296,316
Volvo	183,562	632,142	745,827	1,006,380
Total Usage	(20,240,314)	50,679,940	78,755,431	114,175,369
Banked Credits	285,523,672	234,843,732	156,088,301	41,912,931

The final line of Table 14 shows the running total of credits in the manufacturers' banks at the end of each model year. It starts at the end of 2015 with the total shown in Table 1 above. Because of our assumed static baseline, which, as described above is done for illustrative purposes only, the fleet as a whole uses banked credits in each subsequent year to facilitate compliance. Even in this unrealistic scenario, the banked credits are sufficient to entirely facilitate compliance through the 2018 model year and enable some compliance in the 2019 model year.

Attachment B - Effect of Recent Technology Costs and Technology Effectiveness Estimates on Compliance with EPA's MY2025 GHG Standards

The International Council on Clean Transportation (ICCT) recently surveyed progress in the development of several technologies, which improve the fuel efficiency of light-duty vehicles.[238] These included gasoline direct injection, cooled exhaust gas recirculation (EGR), cylinder deactivation, naturally aspirated Atkinson high compression ratio engines, turbocharged Atkinson (or Miller cycle) engines, electrically boosted turbocharging, weight reduction, diesel engines and electric vehicles. Some of these technologies play a large role in EPA's analyses supporting the Final Determination (FD). Others play a more minor role, at least under the cost and effectiveness projections used by EPA.

This analysis incorporates the more recent cost and effectiveness projections made by ICCT into EPA's OMEGA model to assess the potential impact these updated values have on manufacturer compliance with the EPA GHG standards in 2025. For additional context, we also use the updated ICCT values to assess compliance with the 2021 standards in 2025, as well as several sets of standards more stringent than the 2025 standards.

The description of our analysis is presented below and is divided into three main sections. The first section describes the differences between ICCT's projections of the cost of technology and the latest EPA projections made in support of the Final Determination. This section also describes the process used to incorporate ICCTs projected costs into the input files used by EPA's OMEGA model. The second section does the same thing with respect to ICCT's projected effectiveness for these technologies.

The third and final section describes the impacts of the ICCT cost and effectiveness projections on manufacturer compliance with the various GHG standards in 2025 using the OMEGA model. We also quantify the fuel savings associated with each set of standards for comparison with compliance costs.

I. ICCT Technology Costs

All ICCT technology costs and efficiency estimates apply to the year 2025. With one exception, the ICCT technology cost estimates are at the level of direct manufacturing costs (DMC). Unless otherwise specified, indirect costs associated with the ICCT direct manufacturing costs are derived using EPA's methodology, which provides that indirect costs are a specified function of direct manufacturing costs. The one exception pertains to the cost of vehicle weight reduction. In this case, ICCT suggested no modification to EPA's direct manufacturing costs, but suggested

[238] Lutsey, Nic, Dan Meszler, Aaron Isenstadt, John German and Josh Miller, "Efficiency Technology and Cost Assessment for U.S. 2020-2025 Light-Duty Vehicles", ICCT, March 2017.

that EPA's indirect cost multipliers be modified. The process ICCT used is more fully described in the weight reduction discussion, below. For clarity, any reference to "cost" in this section will be to direct manufacturing costs, unless otherwise specified. The "costs" referred in the final section, Section III, describing the results of OMEGA modeling are total costs to manufacturers and include indirect costs.

EPA's base estimates of technology cost, learning factors and indirect cost multipliers are contained in the OMEGA_TechCosts_Inputs.xlsx spreadsheet. The most recent version of this spreadsheet was the one developed to support the OMEGA modeling for the Final Determination. These basic elements of technology cost projection are then combined by the OMEGA_TechCosts python script to produce estimates of total technology costs for various model years. These total costs are contained in an OMEGA_TechCosts_8405 spreadsheet.

Because we are focused on technology costs for one year, 2025, there was no need to modify EPA's learning factors, which pertain to the change in technology over time. However, we did consider these learning factors, since EPA estimates a base technology cost applicable in a particular model year and adjusts this cost using learning factors for other model years. The base model year usually comes from the timing of the source of the cost estimate and is generally not the 2025 model year. Because the same learning factors are used to adjust the EPA and ICCT costs, a specified difference between the EPA and ICCT costs in 2025 (e.g., 25%) means that there will also be a 25% difference between the EPA and ICCT costs in the base year, and vice versa. Thus, the first step in this adjustment process was to determine the percentage change between the EPA and ICCT cost estimates in 2025. The second step was to adjust EPA's base cost estimate by this same percentage. The final step was to enter this modified cost into the OMEGA_TechCosts_Inputs.xlsx spreadsheet. The specific EPA and ICCT cost estimates for 2025 and the resultant adjusted base costs are discussed for each technology below.

When ICCT refers to EPA cost estimates, these are the DMCs contained in EPA's "OMEGA_TechCosts_8405.xlsx" spreadsheet for the 2025 model year.

A. Gasoline Direct Injection

ICCT estimates that the cost of converting a port fuel injected gasoline (PFI) engine to direct injection (GDI) will be $91-185 compared to EPA's projection of $196-356. The lower end of the range pertains to three and four cylinder engines, while the upper end pertains to eight cylinder engines. EPA's cost for six cylinder engines fall in between the other two costs, though nearer those for the eight cylinder engine. ICCT does not provide a cost estimate for six cylinder engines.

Table 1 shows these figures, as well as the EPA's base costs for the year 2012. The final column in Table 1 shows the adjusted base year GDI cost consistent with the ICCT costs for 2025. They

were derived simply by multiplying the EPA base DMC by the ratio of ICCT to EPA cost for 2025.

Table 1: DMC of Gasoline Direct Injection Technology: Base Year - 2012				
	EPA DMC for 2025	ICCT DMC for 2025	EPA Base DMC	"ICCT" Base DMC
I3/I4	$196	$91	$241	$112
V6	$296	---	$363	$178
V8	$356	$185	$436	$227

As mentioned above, ICCT did not present their estimate for a six cylinder engine. We adjusted EPA's base cost for a six cylinder engine by the average of the adjustments for the four and eight cylinder engines. The adjustment factor was 0.46 for a four cylinder engine and that for the eight cylinder engine was 0.52. Therefore, we multiplied EPA's base cost of $363 for a six cylinder engine by a factor of 0.49 to produce a cost estimate consistent with the other two engines. The base year costs for the ICCT cost case were entered into "et_dmc worksheet of the OMEGA_TechCosts_Inputs.xlsx" spreadsheet.

B. Cooled Exhaust Gas Recirculation (EGR)

Table 2 shows the analogous cost estimates for cooled EGR. For both inline and v-configuration engines, base year ICCT costs were determined by multiplying the base year EPA costs by the ratio of ICCT to EPA 2025 costs. Again, the base year costs for the ICCT cost case were entered into et_dmc worksheet of the OMEGA_TechCosts_Inputs.xlsx spreadsheet.

Table 2: DMC of Cooled Exhaust Gas Recirculation Technology: Base in 2012				
	EPA DMC for 2025	ICCT DMC for 2025	EPA Base DMC	"ICCT" Base DMC
Inline	$216	$95	$265	$117
V configuration	$216	$114	$265	$140

C. Cylinder Deactivation

ICCT's estimate of the cost for cylinder deactivation (DEAC) involves a more sophisticated system than that envisioned by EPA in the Final Determination. Therefore, ICCTs cost estimates

are actually higher than EPA's estimates, though the emission benefits are higher, as well, which we discuss in more detail below.

Table 3 shows the two sets of costs for DEAC technology in 2025 and the base year of 2015.

Table 3: DMC of Cylinder Deactivation: Base in 2015				
	EPA DMC for 2025	ICCT DMC for 2025	EPA Base DMC	"ICCT" Base DMC
I4	$75	$129	$88	$152
V6	$133	---	$157	$270
V8	$149	$256	$177	$304

Again, ICCT did not present their estimate for a six cylinder engine. We adjusted EPA's base cost for GDI technology for a six cylinder engine by the average of the adjustments for the four and eight cylinder engines. The adjustment factor was 1.72 for both the four and eight cylinder engines. Therefore, we multiplied EPA's base cost of $157 for a six cylinder engine by a factor of 1.72 to produce a cost estimate consistent with the other two engines. The base year costs for the ICCT cost case were entered into "et_dmc worksheet of the OMEGA_TechCosts_Inputs.xlsx" spreadsheet.

D. Miller Cycle

ICCT's cost projection for Miller cycle engines differs somewhat from the previous examples. ICCT did not provide a specific dollar cost or cost savings. Instead, they found that the variable geometry turbocharger (which moves an engine from Atkinson to Miller cycle operation) provides the operational flexibility required to achieve Atkinson cycle operation in the first place. Thus, ICCT concluded that the cost of enabling Atkinson cycle operation should have been eliminated when the cost of the Miller-enabling turbocharger was added.

Table 4 shows the EPA DMCs for both Atkinson2 technology and Miller technology in 2025. (Atkinson1 technology costs were already zero, so they did not factor into this adjustment.) It would not have been appropriate to simply set the cost of Atkinson2 technology to zero in our modeling, as it is possible to have an Atkinson2 engine, which is not turbocharged. This engine would involve the costs shown for Atkinson2 technology. Thus, with ICCT's approach to costs, the cost of the Miller engine must be reduced.

Table 4: DMC of Miller Cycle Technology

	EPA DMC for 2025	ICCT DMC for 2025	EPA Base DMC	"ICCT" Base DMC
Atkinson2 Technology (Base in 2025)				
I3/I4	$93	$93	$93	$93
V6	$140	$140	$140	$140
V8	$221	$221	$221	$221
Miller Technology (Base in 2012)				
Inline	$595	$502	$730	$615
V configuration	$1015	$856	$1245	$1049

As shown in Table 4, the cost for Atkinson2 technology is the same for 2025 and the base year, since the base year for that technology is 2025. The base year for Miller technology is 2012, so the cost of Miller technology decreases over time. Since we are focused on costs for the 2025 model year, for the I3 and I4 inline engines, we simply reduced the cost of the Miller technology in 2025 by the $93 cost of the Atkinson2 engine in 2025. This represented a 16% reduction in cost.

The cost of Atkinson2 technology varies between V6 and V8 engines, while the cost of Miller technology is the same and not separated in EPA's costing system. A 16% reduction in the $1015 EPA 2025 cost for a v-configuration engine would be a cost reduction of $159. This is equivalent to a 77/23 weighting of the 2025 Atkinson2 costs for V6 and V8 engines, respectively. We determined this weighting was reasonable and applied the $159 cost reduction to the EPA Miller technology cost in 2025 for v-configuration engines. The EPA base costs for Miller technology were multiplied by the ratio of ICCT to EPA costs in 2025 to obtain ICCT base costs for entry into the OMEGA_TechCosts_Inputs.xlsx spreadsheet.

E. Turbocharging

ICCT identified electrically assisted turbocharging or e-boost as an additional approach to turbocharging that was not included in EPA's analysis for the Final Determination. . ICCT projects that this technology could increase the efficiency of turbocharging by 5% at a cost of $338 in 2025.We declined to include this technology in our analysis however, based on some uncertainties related to EPA's preprocessors for both cost and fuel efficiency. Regarding cost, it was unclear which of three turbocharging options could be enhanced by e-boost: the 18 bar turbocharger, the 24 bar turbocharger, or the turbocharger associated with the Miller cycle

engine. Moreover, it was also unclear whether the 5% improvement cited by ICCT was applicable to all or some subset of the turbocharging scenarios.

At a cost of $338 for a 5% improvement, we expect that e-boost might have been selected by manufacturers facing higher than average compliance costs in 2025, or by more manufacturers as the standards became more stringent than the 2025 standards (see below). Thus, our decision to exclude this technology would likely only affect compliance costs for the scenarios more stringent than the 2025 standards. Given its sizeable cost and benefit, e-boost would appear to deserve its own technology designation so that it could be selected based on a manufacturer's need for further GHG reduction..

F. Cooled Exhaust Gas Recirculation

ICCT found evidence that the cost of cooled EGR systems will be lower than estimated by EPA in the Final Determination analysis. In 2025, ICCT found that cooled EGR systems will only cost $95 for inline engines and $114 for V-configuration engines, versus the $216 cost estimated by EPA for both types of engines. Table 5 shows these costs, as well as the base year ICCT costs consistent with those used by EPA.

Table 5: DMC of Cooled EGR Technology: Base in 2012

	EPA DMC for 2025	ICCT DMC for 2025	EPA Base DMC	"ICCT" Base DMC
Inline	$216	$95	$265	$117
V configuration	$216	$114	$265	$140

G. Weight Reduction

ICCT did not modify EPA's direct manufacturing costs for weight reduction. Instead, they concluded that the indirect cost multiplier for weight reduction should be no greater than 1.5 in the 2025 timeframe. The ICMs for weight reduction are contained on worksheet "wr_ICcurves in the OMEGA_TechCosts_Inputs.xlsx spreadsheet." There are two sets of ICMs for weight reduction: one for weight reductions achieved by a supplier in the components which they supply to the manufacturer and another for those implemented by auto manufacturers themselves. The ICMs for suppliers are 1.29, while those for manufacturers are 1.72. The ICMs for suppliers were left at 1.29, while those for manufacturers were set at 1.5.

H. Electric Vehicles

ICCT projects that the costs of battery electric vehicles and plug-in electric vehicles will be significant less than those estimated by EPA in the Final Determination. One of the studies cited by ICCT is an ICCT literature review conducted by Paul Wolfram and Nic Lutsey last year.[239] As we had previous evaluated the projected BEV and PHEV costs made in this review and modified EPA's cost preprocessors to include them, we utilized those costs and our methodology here. The two sets of ICCT estimates appear to be very consistent with respect to battery cost, credit for the replaced internal combustion engine and other non-battery components. However, we did not include a reduced cost for home charging equipment mentioned in the most recent ICCT study.

The ICCT literature review covered the 2015-2030 timeframe and focused on the costs of BEV and PHEV for a low, medium car. A summary of their analysis is shown in Table 6 (costs presented in Euros were converted to US$ by dividing by 0.79). Wolfram and Lutsey evaluated ten types of electrified vehicles, including battery electric vehicles (EVs), plug-in hybrid vehicles (PHEVs), and a fuel-cell vehicle. Eight EVs and PHEVs are shown below. The numbers following the vehicle type designator indicates the range of the vehicle on all-electric operation.

Table 6: ICCT Costs Converted to Dollars (1 dollar = 0.79 Euro)				
Low Medium (Small) Car				
ICCT Vehicle Type and ICCT Range	2015	2020	2025	2030
EV-100	$7,152	$3,796	$1,736	$466
EV-150	$10,949	$6,325	$3,462	$1,758
EV-200	$14,747	$8,786	$5,062	$2,865
EV-300	$22,342	$13,707	$8,261	$5,080
PHEV-20	$4,927	$3,860	$3,124	$2,297
PHEV-30	$6,096	$4,689	$3,669	$2,696
PHEV-40	$7,224	$5,489	$4,195	$3,109
PHEV-60	$9,354	$6,999	$5,189	$3,508

[239] Wolfram, P., and Lutsey, N.. "Electric vehicles: Literature review of technology costs and carbon emissions", ICCT, 2016

As can be seen, the costs for all eight technologies are projected to decrease dramatically through 2030. The projected cost of EVs decreases more dramatically than those for PHEVs, despite the fact that both types of vehicles use very comparable types of batteries and electrical components. The difference in the degree of cost reduction is due to the fact that the costs for EVs includes a credit for the removal of the conventional gasoline engine and transmission. This credit is unaffected by the reduction in the cost of electrical components and battery technology. As the cost of electrification approaches the cost of the conventional drivetrain, the net cost of EVs can become quite small. Since PHEVs continue to utilize a conventional drivetrain, their costs decrease at a slower rate.

Based on communication with the authors, their estimate of all-electric range was that over a European test cycle. Lutsey estimated that their range for EVs should be discounted by 16% to be equivalent to that used by EPA in their Final Determination analysis. Similarly, the ICCT range for PHEVs should be discounted by 37%. Adjusting for a change in vehicle range should only affect the size and cost of the battery. For EVs and PHEVs, respectively, battery costs changed linear with vehicle range, so we continued this assumption.

In the Final Determination, EPA included five types of electrified vehicles: EV75, EV100, EV200, PHEV20, and PHEV40. The vehicles evaluated by ICCT which come closest to these five EPA vehicle designs are the EV100, EV150, EV300, PHEV30 and PHEV60. We obtained a breakdown of EV and PHEV costs into non-battery components, battery, and credit for removal of the internal combustion engine (ICE) and transmission (EVs only) from ICCT. We then adjusted the battery cost so that the vehicle's all-electric range would match that assumed by EPA. Again, battery costs were assumed to be proportional to all-electric vehicle range, which was consistent with the original ICCT cost projections. The results are shown in Table 7 below.

Table 7: ICCT Costs Converted to Dollars and EPA-Equivalent Range (1 dollar = 0.79 Euro)				
Low Medium (Small) Car				
EPA Vehicle Type and EPA Range	2015	2020	2025	2030
EV75	$6,338	$3,269	$1,393	$229
EV100	$8,599	$4,802	$2,472	$1,073
EV200	$17,640	$10,661	$6,280	$3,709
PHEV20	$6,296	$4,830	$3,762	$3,180
PHEV40	$9,743	$7,275	$5,370	$4,398

These projected costs are compared below to EPA's projected costs for these vehicle types used in their final rulemaking and the recent FD analysis.

1. EV and PHEV Costs in EPA's FD Analysis

EPA conducted its own analysis of a wide range of projections of electrification costs in the FD analysis. These projections addressed six vehicle classes: small cars, standard cars, large cars, small multiple purpose vehicles (MPVs), large MPVs and trucks. EPA first developed estimates of direct manufacturing costs for each type of electrified vehicle technology and then added indirect cost multipliers to produce cost estimates at the consumer level. EPA's small car class includes both subcompact and compact cars. This class seems to line up best with the low medium car evaluated by Wolfram and Lutsey. Also, given the sources used by Wolfram and Lutsey, which included several also used by EPA, and the absence of any discussion of indirect cost multipliers or retail price equivalent costs, the ICCT cost projections appear to represent direct manufacturing costs. Table 8 shows EPA's cost projections for the five electrified vehicle types discussed in the FD analysis.

Table 8: EPA Electrified Vehicle Direct Manufacturing Costs

Small Car	2015	2020	2025	2030
EV-75	$7,365	$5,267	$4,327	$3,832
EV-100	$8,453	$6,048	$4,971	$4,403
EV-200	$12,577	$9,011	$7,412	$6,569
PHEV-20	$6,656	$5,190	$4,493	$4,099
PHEV-40	$8,364	$6,508	$5,627	$5,131

These estimates at the direct manufacturing cost level were produced by 1) setting the inputs to EPA's OMEGA_TechCost_Inputs.xlsx spreadsheet to request cost estimates for 2015-2030 and then 2) running EPA's python script, (OMEGA_TechCosts.py) to produce a version of EPA's OMEGA_TechCosts.xlsx spreadsheet. The direct manufacturing costs for the battery and non-battery components for above EV and PHEV vehicles were taken from the EV_techs worksheet. As can be seen, the ICCT and EPA cost estimates are closest for model years 2015-2020, but diverge thereafter, with the ICCT cost projections decreasing more dramatically than those of EPA. Also, the two sets of cost projections are closer for PHEVs and more divergent for BEVs. As indicated in the Introduction, the potential impact of these lower costs for PHEVs and BEVs

on future GHG emission reductions is the primary impetus for this analysis. In order to maximize the comparability of the projections developed here with similar projections presented by EPA in the FD analysis, we use EPA's OMEGA model for these projections. This requires that we develop ICCT-like costs for all six vehicle types, as well as include indirect cost multipliers in the electrification cost projections.

2. Extrapolation of ICCT Cost Estimates to Other Vehicle Types

The first step in extrapolating the ICCT cost projections for small cars to other vehicle classes was to examine how EPA's cost projections varied across the six vehicle classes. Table 9 shows the EPA's cost projections for a BEV100, broken down into three categories: non-battery electrification components, credit for the removal of the conventional drivetrain and battery cost. This breakdown was chosen, as ICCT's cost projections for a small car could also be presented at this level. A further breakdown was not possible given differences in the breakdown of non-battery components in the ICCT and EPA analyses.

These costs are those at the direct manufacturing level and are again taken from EPA's spreadsheet: BatteryCostingCalculator_PD_2016_20160317.xlsx. As described above, the non-battery electrification components and the credit for the removal of the conventional drivetrain represent those for the 2017 model year. Battery costs are for model year 2025. This difference is not important at this step, since the costs for the two different model years are not combined into a single estimate until later when they are placed on a consistent basis.

Table 9: EPA Direct Manufacturing Costs - EV100 *						
	Small Car	Standard Car	Large Car	Small MPV	Large MPV	Truck
Non-Battery Components	$2,491	$3,151	$4,908	$2,950	$3,935	$4,382
ICE credit	$(2,625)	$(2,625)	$(3,543)	$(3,467)	$(3,467)	$(4,767)
Battery	$4,533	$5,306	$6,476	$5,404	$6,266	$6,673
Ratio of Cost to That of a Small Car						
	Small Car	Standard Car	Large Car	Small MPV	Large MPV	Truck
Non-Battery Components	----	1.26	1.97	1.18	1.58	1.76

ICE credit	----	1.00	1.35	1.32	1.32	1.82
Battery	----	1.17	1.43	1.19	1.38	1.47
* Non-Battery Components and ICE Credit apply in 2017, battery cost for 2025						

As shown in Table 9, all three components of costs increase as one moves from a small car to the other vehicle classes. These costs increase to different degrees, however. The lower half of Table 9 shows the ratio of each cost component to that for a small car. As can be seen, the three component costs change to a different degree for each vehicle class. Tables 10-13 show analogous information for EV75s, EV200s, PHEV20s and PHEV40s.

Table 10: EPA Direct Manufacturing Costs - EV75						
	Small Car	Standard Car	Large Car	Small MPV	Large MPV	Truck
Non-Battery Components	$2,491	$3,151	$4,908	$2,950	$3,935	$4,382
ICE Credit	$(2,625)	$(2,625)	$(3,543)	$(3,467)	$(3,467)	$(4,767)
Battery	$3,962	$4,411	$5,807	$4,514	$5,380	$5,856
Ratio of Cost to That of a Small Car						
Non-Battery Components		1.26	1.97	1.18	1.58	1.76
ICE Credit		1.00	1.35	1.32	1.32	1.82
Battery		1.11	1.47	1.14	1.36	1.48

Table 11: EPA Direct Manufacturing Costs - EV200						
	Small Car	Standard Car	Large Car	Small MPV	Large MPV	Truck
Non-Battery Components	$2,493	$3,152	$4,909	$2,951	$3,934	$4,385
ICE Credit	$(2,625)	$(2,625)	$(3,543)	$(3,467)	$(3,467)	$(4,767)

Battery	$6,712	$7,394	$8,851	$7,734	$9,160	$9,795
Ratio of Cost to That of a Small Car						
Non-Battery Components		1.26	1.97	1.18	1.58	1.76
ICE Credit		1.00	1.35	1.32	1.32	1.82
Battery		1.10	1.32	1.15	1.36	1.46

Table 12: EPA Direct Manufacturing Costs - REEV20						
	Small Car	Standard Car	Large Car	Small MPV	Large MPV	Truck
Non-Battery Components	$2,122	$2,443	$3,214	$2,344	$2,835	$3,013
Battery	$2,463	$2,690	$3,157	$2,737	$3,025	$3,190
Ratio of Cost to That of a Small Car						
Non-Battery Components		1.15	1.51	1.10	1.34	1.42
Battery		1.09	1.28	1.11	1.23	1.30

Table 13: EPA Direct Manufacturing Costs – REEV40						
	Small Car	Standard Car	Large Car	Small MPV	Large MPV	Truck
Non-Battery Components	$2,597	$3,175	$4,725	$2,997	$3,850	$4,250
Battery	$3,130	$3,705	$5,528	$3,661	$4,620	$5,073
Ratio of Cost to That of a Small Car						
Non-Battery Components		1.22	1.82	1.15	1.48	1.64
Battery		1.18	1.77	1.17	1.48	1.62

As can be seen from the cost ratios in Tables 9, 10 and 11, the ratio of the cost estimates for other vehicle classes relative to those for a small car isexactly the same for EV75s, EV100s and BEV200s. The ratios for PHEVs differ from those for EVs. In addition, the ratios for PHEV40s are much higher than those for PHEV20s.

3. ICCT Costs for All Vehicle Classes

The cost ratios presented in Tables 9-13 above are used to produce projected costs for the five vehicle classes not addressed directly by the ICCT analysis. The first column of costs in Table 14 below presents the breakdown of ICCT cost projections for a small EV75 car in 2030. The last five columns present analogous cost projections for the other five vehicle classes using the cost ratios from Table 9. For example, the ICCT cost of $2251 for non-battery components for a small car is multiplied by a factor of 1.26 from Table 9 to produce a cost of $2847 for the non-battery components for a standard car.

Table 14: ICCT Costs in Dollars in 2025 – EV75

	Small Car	Standard Car	Large Car	Small MPV	Large MPV	Truck
Non-Battery Components	$2,537	$2,963	$3,135	$3,559	$4,130	$4,218
ICE credit	$(4,000)	$(4,000)	$(5,398)	$(5,282)	$(5,282)	$(7,263)
Battery	$2,856	$2,984	$3,066	$3,240	$3,674	$3,738
Total	$229	$1,947	$803	$1,517	$2,522	$693

The same methodology was used to generate the cost projections for BEV200, PHEV20 and PHEV40 vehicles in the five vehicle classes not directly assessed by ICCT. These figures are shown in Tables 15-18.

Table 15: ICCT Costs in Dollars in 2025 - EV100

	Small Car	Standard Car	Large Car	Small MPV	Large MPV	Truck
Non-Battery Components	$ 2,664	$ 3,111	$ 3,292	$ 3,736	$ 4,336	$ 4,429

ICE credit	$ (4,000)	$ (4,000)	$ (5,398)	$ (5,282)	$ (5,282)	$ (7,263)
Battery	$ 3,808	$ 4,031	$ 4,160	$ 4,502	$ 5,317	$ 5,327
Total	$ 1,073	$ 3,141	$ 2,053	$ 2,957	$ 4,371	$ 2,492

Table 16: ICCT Costs in Dollars in 2025 – EV200						
	Small Car	Standard Car	Large Car	Small MPV	Large MPV	Truck
Non-Battery Components	$2,664	$3,110	$3,291	$3,735	$4,333	$4,429
ICE credit	$(4,000)	$(4,000)	$(5,398)	$(5,282)	$(5,282)	$(7,263)
Battery	$7,617	$8,032	$8,295	$8,790	$10,051	$10,068
Total	$3,709	$7,142	$6,188	$7,243	$9,102	$7,234

Table 17: ICCT Costs in Dollars in 2025 - REEV20						
	Small Car	Standard Car	Large Car	Small MPV	Large MPV	Truck
Non-Battery Components	$2,072	$2,282	$2,360	$2,519	$2,818	$2,838
Battery	$1,690	$1,787	$1,825	$1,927	$2,088	$2,083
Total	$3,762	$4,069	$4,185	$4,445	$4,906	$4,921

Table 18: ICCT Costs in Dollars in 2025 – REEV40						
	Small Car	Standard Car	Large Car	Small MPV	Large MPV	Truck

Non-Battery Components	$2,072	$2,366	$2,482	$2,791	$3,155	$3,223
Battery	$3,298	$1,819	$1,896	$2,064	$2,537	$2,589
Total	$5,370	$4,185	$4,378	$4,855	$5,692	$5,812

These effects of a 100% weight reduction were entered into the ev1_dmc_curves worksheet of EPA's OMEGA_TechCost_Inputs.xlsx spreadsheet.

4. Effect of Weight Reduction on EV/PHEV Costs

In the FD analysis, EPA estimates the impact of weight reduction on the cost of EV and PHEV technology. The lower the weight of the vehicle, the lower the cost of both the battery and non-battery components of these technologies. Table 19 shows the base cost of the battery and non-battery components (without the ICE drivetrain credit) for an EV75 for the six vehicle types, as well as the reduction in this cost for a 100% reduction in vehicle weight. The effect of realistic reductions in vehicle weight are determined as a simple fraction of the percentage weight reduction divided by 100%.

Table 19: EPA Electrification Cost Reduction per Weight Reduction: EV75						
Battery	Small Car	Standard Car	Large Car	Small MPV	Large MPV	Truck
Base Cost	$3,960	$4,414	$5,807	$4,515	$5,381	$5,839
Cost Reduction for 100% Wt. Red.	$(885)	$(1,123)	$(2,702)	$(1,136)	$(1,377)	$(2,010)
	-22%	-25%	-47%	-25%	-26%	-34%
Non-Battery with no ICE credit						
Base Cost	$2,491	$3,151	$4,908	$2,950	$3,935	$4,382
Cost Reduction for 100% Wt. Red.	$(978)	$(1,542)	$(3,190)	$(1,381)	$(2,183)	$(2,684)
	-39%	-49%	-65%	-47%	-55%	-61%

The same methodology was applied to EPA's cost estimates for EV100, EV200, PHEV20 and PHEV40 vehicles. The results are shown in Tables 20-24 below.

Table 20: EPA Electrification Cost Reduction per Weight Reduction: EV100						
Battery	Small Car	Standard Car	Large Car	Small MPV	Large MPV	Truck
Base Cost	$4,534	$5,306	$6,475	$5,407	$6,265	$6,676
Cost Reduction for 100% Wt. Red.	-$1,121	-$1,319	-$2,823	-$1,064	-$1,679	-$1,940
	-25%	-25%	-44%	-20%	-27%	-29%
Non-Battery with no ICE credit						
Base Cost	-$978	-$1,542	-$3,190	-$1,381	-$2,183	-$2,684
Cost Reduction for 100% Wt. Red.	$2,491	$3,151	$4,908	$2,950	$3,935	$4,382
	-39%	-49%	-65%	-47%	-55%	-61%

Table 21: EPA Electrification Cost Reduction per Weight Reduction: EV200						
Battery	Small Car	Standard Car	Large Car	Small MPV	Large MPV	Truck
Base Cost	$6,710	$7,394	$8,851	$7,734	$9,156	$9,792
Cost Reduction for 100% Wt. Red.	-$1,628	-$2,063	-$2,630	-$2,315	-$2,468	-$2,856
	-24%	-28%	-30%	-30%	-27%	-29%
Non-Battery with no ICE credit						
Base Cost	$2,493	$3,152	$4,909	$2,951	$3,934	$4,385
Cost Reduction for 100% Wt. Red.	-$978	-$1,542	-$3,190	-$1,381	-$2,183	-$2,684
	-39%	-49%	-65%	-47%	-55%	-61%

Table 22: EPA Electrification Cost Reduction per Weight Reduction: PHEV20						
Battery	Small Car	Standard Car	Large Car	Small MPV	Large MPV	Truck
Base Cost	$2,463	$2,689	$3,157	$2,737	$3,025	$3,190
Cost Reduction for 100% Wt. Red.	-$403	-$518	-$1,039	-$502	-$849	-$981
	-16%	-19%	-33%	-18%	-28%	-31%
Non-Battery with no ICE credit						
Base Cost	$2,122	$2,443	$3,214	$2,344	$2,835	$3,013
Cost Reduction for 100% Wt. Red.	-$426	-$672	-$1,390	-$601	-$951	-$1,169
	-20%	-27%	-43%	-26%	-34%	-39%

Table 23: EPA Electrification Cost Reduction per Weight Reduction: PHEV40						
Battery	Small Car	Standard Car	Large Car	Small MPV	Large MPV	Truck
Base Cost	$3,130	$3,685	$5,337	$3,661	$4,629	$5,073
Cost Reduction for 100% Wt. Red.	-$891	-$2,607	-$28,870	-$1,293	-$1,124	-$2,270
	-28%	-71%	-541%	-35%	-24%	-45%
Non-Battery with no ICE credit						
Base Cost	$2,597	$3,175	$4,705	$2,997	$3,850	$4,250
Cost Reduction for 100% Wt. Red.	-$852	-$1,343	-$2,780	-$1,203	-$1,902	-$2,338
	-33%	-42%	-59%	-40%	-49%	-55%

The effect of a 100% weight reduction on the cost of either battery or non-battery component costs for each vehicle types (in percentage terms) was applied to the battery and non-battery component costs based on the ICCT projections shown in Tables 14-18 above to estimate the

effect of weight reduction on ICCT-based EV and PHEV costs. The results are shown in Table 24 below.

Table 24: EV and PHEV Cost Reduction for 100% Weight Reduction						
Battery	Small Car	Standard Car	Large Car	Small MPV	Large MPV	Truck
EV75	$(569)	$(850)	$(983)	$(737)	$(1,460)	$(1,522)
EV100	$(973)	$(1,394)	$(1,730)	$(2,613)	$(5,053)	$(4,653)
EV200	$(2,197)	$(2,882)	$(3,347)	$(4,279)	$(8,244)	$(7,490)
PHEV20	$(304)	$(794)	$(348)	$(370)	$(596)	$(598)
PHEV40	$(413)	$(262)	$(296)	$245	$(3,363)	$(4,154)
Non-Battery Components						
EV75	$100	$141	$145	$198	$250	$242
EV100	$106	$149	$154	$209	$263	$257
EV200	$284	$285	$579	$481	$1,080	$897
PHEV20	$53	$71	$79	$103	$125	$132
PHEV40	$85	$114	$127	$(248)	$199	$(954)

These effects of a 100% weight reduction were entered into the ev1_dmc_curves worksheet of EPA's OMEGA_TechCost_Inputs.xlsx spreadsheet.

I. Diesel

ICCT estimates that the costs of dieselization of a gasoline engine are $600-850 lower than the costs estimated by EPA in the FD for the range of engines in the fleet in 2025. The EPA DMCs for dieselization are shown in Table 25.

Table 25: DMC of Gasoline Direct Injection Technology: Base in 2012				
Vehicle Type	EPA DMC for 2025	ICCT DMC for 2025	EPA Base DMC	"ICCT" Base DMC
1	$2,104	$1504	$2,581	$1,845

2	$2,104	$1504	$2,581	$1,845
3	$2,578	---	$3,162	$2,261
4	$2,578	---	$3,162	$2,261
5	$2,578	---	$3,162	$2,261
6	$2,950	$2100	$3,618	$2,587

The lower end of the range of cost reduction is assumed to apply to vehicle types 1 and 2, while the upper end is assumed to apply to vehicle type 6. The ICCT base year costs for these three vehicle types were calculated by multiplying the EPA base DMCs by the ratio of the 2025 ICCT to 2025 EPA costs.

Regarding vehicle types 3, 4, and 5, the ratio of the 2025 ICCT cost to the 2025 EPA cost is almost exactly the same for vehicle types 1, 2, and 6: 0.712-0.714. We therefore estimated the base year ICCT dieselization cost for vehicle types 3, 4, and 5 by multiplying the base year EPA cost for these vehicles by 0.713. These ICCT base year costs were entered into the et_dmc worksheet of EPA's OMEGA_TechCosts_Inputs.xlsx spreadsheet.

II. ICCT Estimates for Fuel Efficiency

ICCT developed alternative efficiency estimates for five of the above technologies. These were cylinder deactivation, Atkinson2 engines with cooled EGR, electrically boosted turbocharging, mild hybrid vehicles, and weight reduction. As mentioned above, we decided not to include the ICCT cost and efficiency estimates for electrically boosted turbocharging, so the efficiency of the remaining four technologies is discussed more fully below.

EPA utilizes the lumped parameter model (LPM) to estimate the fuel efficiency of single and multiple technologies in its OMEGA modeling. Behind the estimates of the LPM are engine tests, vehicle tests and more sophisticated vehicle modeling using the EPA ALPHA model. One of the key purposes of both ALPHA and LPM is to account for synergies between the various technologies.

A. Cylinder Deactivation

ICCT estimated the benefit of dynamic cylinder deactivation to be 6.5-8.3% across the six EPA vehicle types compared with EPA's estimates for a simpler deactivation system of 3.5-5.8%. The EPA LPM is embedded in a spreadsheet called the Machine. Version Machine_2015b was used here. The LPM is contained specifically on worksheet LP Model. The presence of cylinder deactivation is indicated on line 41. We were able to replicate the 3.5-5.8% range of benefit of

cylinder deactivation by placing a value of 1 in cell L41 and toggling across the six vehicle classes. The effectiveness of cylinder deactivation is contained in several formulae which refer to the value contained in cell L41. We facilitated an increase in the effectiveness of cylinder deactivation across the range of efficiency losses by inserting a variable factor. We found that we could increase the 3.5% effectiveness to 6.5% by setting this factor at 1.45. We also found that we could increase the 5.8% effectiveness to 8.3% by setting this factor at 1.72. We therefore set the value of this factor at 1.585, which was the average of the two factors which provided a match to the endpoints of the ICCT estimates. This increase in the effectiveness of cylinder deactivation was applied whenever the Machine was used in the generation of input files for OMEGA modeling.

B. Atkinson2 Engines with Cooled EGR

EPA estimates the benefit of Atkinson2 technology with cooled EGR to be 3-8% across the six EPA vehicle types, with an average benefit of 6%. Based on its literature review, ICCT projects that this technology can be much more effective: 10-14% across the six EPA vehicle types, with an average benefit of 12.5%.

The presence of cooled EGR and Atkinson technology are indicated in cells L63 and L70 in the LPM, respectively. We attempted to insert a variable factor which increased the effectiveness of the Atkinson engine half of this combination of technologies (i.e., increasing the value of L70, which is normally 1). While this increased the effectiveness of the Atkinson engine with cooled EGR to some degree, we could not achieve the increase projected by ICCT. However, we could do so when we inserted a factor which increased the effectiveness of cooled EGR. Adding a multiplicative factor of 2.5 to the value of L63 achieved the average 6% increase in efficiency projected by ICCT. Therefore, the Machine was modified to multiply the value in cell L63 by 2.5.

Because cooled EGR is used in conjunction with other technologies, specifically a 24-bar turbocharger, we added additional logic which prevented the factor of 2.5 from being applied except when Atkinson technology was also present.

C. Mild Hybrid Technology

EPA estimates the benefit of mild hybridization to be 7-9.5% across the six EPA vehicle types, with an average benefit of 9.1% for car and sport utility vehicle (SUV) types. Based on its literature review, ICCT projects that this technology can be much more effective: 10.5-12.9% across the six EPA vehicle types, with an average benefit of 12.5% across car and SUV vehicle types.

EPA models the effectiveness of various types of hybridization through the specification of values in cell K67 when a vehicle is hybridized. For mild hybrids, the value placed in cell K67 varies by vehicle type. We determined that multiplying these factors by 1.53 achieved the range and average increase in effectiveness indicated by ICCT. The original EPA values for cell K67 and the modified values are shown in Table 26. In the "ICCT" version of the Machine, the "ICCT" values to be placed in cell K67 were entered into the Macro labeled Calc LPM.

Table 26: Adjustment to the Modeling of Mild Hybrids in the Lumped Parameter Model

Vehicle Type	EPA Value for Cell K67	"ICCT" Value for Cell K67
1	5.45	8.34
2	6.05	9.26
3	8.7	13.31
4	6.75	10.33
5	9.7	14.84
6	9.8	14.99

D. Weight Reduction

ICCT projects a small increase in the benefit of weight reduction (0.57-0.68% per % reduction in vehicle mass across the six vehicle types) relative to EPA's estimates in the FD analysis (0.55-0.68% per % reduction in vehicle mass). The effect of weight reduction on fuel efficiency is fairly complex in EPA's preprocessing spreadsheets. Given that the projected improvement is very small, this change was not included in the OMEGA modeling performed in this study.

III. OMEGA Modeling

EPA's OMEGA model was run with the FD analysis inputs and the revised set of costs and technology effectiveness estimates as described above. Six sets of standards were run for the 2025 model year:

1) The 2021 standards,
2) The 2025 standards,
3) A 10 g/mi reduction for both cars and light trucks from the 2025 standards,
4) A 20 g/mi reduction for both cars and light trucks from the 2025 standards,

5) A 30 g/mi reduction for both cars and light trucks from the 2025 standards,

6) A 40 g/mi reduction for both cars and light trucks from the 2025 standards,

The fleet-wide two-cycle CO2 levels and average compliance cost for the six scenarios are shown in Table 27.

Table 27: Achieved CO2 Levels and Average Compliance Costs			
Standards	Achieved CO2 Level	Average Cost per Vehicle	Cost Relative to 2025 Standards
	EPA Final Determination Costs		
2021 Stds in 2025	233.3	$484	$(1,049)
2025 Stds in 2025	196.1	$1,534	---
10 g/mi reduction	186.5	$1,906	$372
20 g/mi reduction	178.3	$2,322	$789
30 g/mi reduction	170.9	$2,684	$1,150
40 g/mi reduction	167.5	$2,992	$1,459
	ICCT 2025 with Reduced EV Costs		
2021 Stds in 2025	233.3	$365	$(583)
2025 Stds in 2025	196.0	$948	---
10 g/mi reduction	186.1	$1,169	$221
20 g/mi reduction	176.2	$1,437	$489
30 g/mi reduction	166.3	$1,775	$828
40 g/mi reduction	156.6	$2,242	$1,294
	Effect of the ICCT Cost and Efficiency Estimates Relative to EPA Estimates		
2021 Stds in 2025	0.0	$(119)	$466
2025 Stds in 2025	-0.1	$(586)	-
10 g/mi reduction	-0.4	$(737)	$(151)

20 g/mi reduction	-2.1	$(885)	$(299)
30 g/mi reduction	-4.6	$(908)	$(323)
40 g/mi reduction	-10.9	$(750)	$(165)

As shown by the reduction in the achieved level of CO2 emissions, the inclusion of the ICCT cost and effectiveness estimates enable the more challenged manufacturers to achieve lower CO2 levels as the standards are made more stringent than the 2025 standards. Compliance costs are also significantly lower, with cost savings ranging from $586 for the 2025 standards to a high of $908 for the 40 g/mi reduction scenario.

Tables 27 and 28 present the penetration of selected technologies in the 2025 model year fleet using the EPA and ICCT cost and effectiveness projections, respectively.

Table 28: Technology Penetration with EPA Costs and Effectiveness in the 2025 Model Year Fleet

	2021 Stds	2025 Stds	-10 g/mi	-20 g/mi	-30 g/mi	-40 g/mi
Turbo	24%	41%	46%	50%	52%	55%
High CR	7%	36%	38%	34%	31%	28%
8 Speed	92%	91%	90%	88%	86%	84%
Mass Red	6%	9%	9%	9%	9%	9%
Off-cycle	4%	30%	44%	47%	46%	46%
Stop Start	13%	39%	51%	51%	44%	40%
MHEV	2%	15%	20%	23%	29%	36%
Strong HEV	2%	3%	4%	7%	10%	7%
PHEV	2%	2%	2%	2%	3%	3%
EV	2%	5%	7%	9%	11%	13%

Table 29: Technology Penetration with ICCT Costs and Effectiveness

	2021 Stds	2025 Stds	-10 g/mi	-20 g/mi	-30 g/mi	-40 g/mi
Turbo	26%	13%	11%	9%	11%	13%
High CR	30%	62%	70%	75%	77%	72%
8 Speed	91%	93%	92%	91%	88%	85%
Mass Red	5%	7%	7%	7%	7%	7%
Off-cycle	0%	1%	4%	9%	24%	49%
Stop Start	8%	6%	5%	3%	3%	5%
MHEV	0%	10%	16%	26%	37%	48%
Strong HEV	2%	2%	2%	2%	2%	2%
PHEV	2%	2%	2%	2%	2%	3%
EV	2%	3%	4%	6%	8%	12%

The largest differences in technology penetration with the 2025 standards occur with increased use of Atkinson engines (labeled high CR (Compression Ratio)) with the ICCT estimates. Use of mild hybrid technology also increased relative to EPA projections at the -20 g/mi" and more stringent scenarios. Penetrations of all other technologies generally decreased. These differences are likely due to the increased effectiveness of cylinder deactivation and Atkinson technology with cooled EGR.

Table 30 shows the lifetime fuel savings for the average 2025 model year vehicle projected to comply using the ICCT estimates. As can be seen, these fuel savings significantly exceed the average compliance costs.

Table 30: Fuel Savings per Vehicle with ICCT Costs and Effectiveness		
	Relative to 2021 Stds	Relative to 2025 Stds
2025 Stds in 2025	$3,084	---
10 g/mi reduction	$3,920	$837
20 g/mi reduction	$4,763	$1,680
30 g/mi reduction	$5,614	$2,530

40 g/mi reduction	$6,465	$3,381
	Discounted @3% per year	
2025 Stds in 2025	$2,473	---
10 g/mi reduction	$3,144	$671
20 g/mi reduction	$3,819	$1,347
30 g/mi reduction	$4,501	$2,029
40 g/mi reduction	$5,184	$2,711
	Discounted @7% per year	
2025 Stds in 2025	$1,896	---
10 g/mi reduction	$2,411	$514
20 g/mi reduction	$2,929	$1,033
30 g/mi reduction	$3,452	$1,556
40 g/mi reduction	$3,975	$2,079

Attachment C – Emissions Impact of Relaxed Fuel Economy and GHG Emission Standards

EPA and NHTSA have indicated that they may be re-evaluating the level of the GHG and fuel economy standards for the 2021 model year as part of their respective efforts related to reviewing and setting MY 2022-2025 standards.[240] EPA's reconsideration of the Final Determination and NHTSA's upcoming rule actions have the potential to affect the levels of the 2021-2025 GHG emission standards already promulgated by EPA. To further illustrate the benefits of the MY2021 standards and the MY2022-2025 standards, EDF conducted an analysis to quantify the potential clean air benefits that are at risk if EPA reconsiders the MY2021 standards or takes action to weaken the MY2022-2025 standards. The CO_2 emission impacts are primarily due to the weakening of the fuel economy and GHG emission standards. Additional CO_2 emission impacts are associated with the increased level of gasoline production. The criteria emission impacts are due primarily to the increased level of gasoline production, as the applicable vehicle emission standards for criteria pollutants would be unaffected. However, increased fuel economy reduces the cost of driving, which is projected to marginally increase the demand for driving (i.e., VMT). Increased VMT increases CO_2 and criteria emissions. Weakening future GHG (and fuel economy) standards from those already promulgated will increase the cost of driving, therefore reducing the projected increase in VMT and vehicular emissions accordingly.

The emission impacts were estimated using the most recent version of EPA's ICBT benefits model, which was developed for the recent Final Determination regarding the review of the 2025 GHG standards. As the focus of this study was solely emissions, and not economic impacts, only two inputs to the ICBT model needed to be adjusted: CO_2 emission targets for 2021-2025 and vehicular electricity usage.

As mentioned above, two scenarios were developed to bracket the potential emissions impacts.[241] The first scenario assumed that the 2020 standards were extended indefinitely. The second scenario reduced the degree of emission control achieved by the 2025 standards by 50%. The intermediate standards applicable in the 2021-24 model years were adjusted to reflect a constant g/mi CO_2 decrease in the car and truck standards between 2020 and 2025, respectively. The CO_2 standards as currently promulgated and the two weakened scenarios for passenger cars and light trucks are shown in Tables 1 and 2.

Table 1: GHG Emission Standards for Passenger Cars (g/mi)

[240] EPA Request for Comment, 82 Fed. Reg. at 39,553.

[241] Both of these two scenarios are presented solely for the basis of comparison, as they each reflect extreme and indefensible approaches.

Model Year	Current Standards	Scenario 1: 2020 Standards Extended Indefinitely	Scenario 2: 2025 standard weakened by 50%
2020	204.1	204.1	204.1
2021	189.9	204.1	200.3
2022	183.6	204.1	196.5
2023	177.5	204.1	192.7
2024	171.6	204.1	188.9
2025 and beyond	166.1	204.1	185.2

Table 2: GHG Emission Standards for Light Trucks (g/mi)			
Model Year	Current Standards	Scenario 1: 2020 Standards Extended Indefinitely	Scenario 2: 2025 standard weakened by 50%
2020	288.0	288.0	288.0
2021	262.1	288.0	282.7
2022	252.5	288.0	277.3
2023	243.2	288.0	272.0
2024	234.4	288.0	266.6
2025 and beyond	226.2	288.0	261.2

Electricity usage under the current GHG standards is quite small. Electricity usage with the 2020 standards extended indefinitely were simply held at the 2020 levels projected by EPA in the Final Determination. Electricity usage for the second scenario was estimated using the same methodology described above for the CO_2 emission targets. This is an approximation, as EPA's OMEGA emissions model was not rerun with the relaxed emission standards. However, given the very small increase in the number of electric vehicles projected to be sold due to the 2025 standards, this approximation should be quite reasonable for the purposes of this analysis. Electricity usage under the current GHG standards and under the two relaxed scenarios are shown in Tables 3 and 4, respectively for cars and light trucks.

Table 3: Electricity Usage by Passenger Cars (kw-hr/mi)			
Model Year	Current Standards	Scenario 1: 2020 Standards Extended Indefinitely	Scenario 2: 2025 standard reduced by 50%
2020	0.00707	0.00707	0.00707
2021	0.00993	0.00707	0.00778
2022	0.01102	0.00707	0.00849
2023	0.01212	0.00707	0.00920
2024	0.01321	0.00707	0.00990
2025 and beyond	0.01430	0.00707	0.01061

Table 4: Electricity Usage by Light Trucks (kw-hr/mi)			
Model Year	Current Standards	Scenario 1: 2020 Standards Extended Indefinitely	Scenario 2: 2025 standard reduced by 50%
2020	0.00006	0.00006	0.00006
2021	0.00495	0.00006	0.00007
2022	0.00574	0.00006	0.00007
2023	0.00652	0.00006	0.00008
2024	0.00731	0.00006	0.00008
2025 and beyond	0.00809	0.00006	0.00009

The impact of the two relaxed control scenarios are shown below for four pollutants: CO_2 equivalent (CO_2e) emissions, VOC emissions, NOx emissions, and PM2.5 emissions. CO_2e emissions include CO_2 emissions, nitrous oxide (N_2O) emissions, and methane (CH_4) emissions, with the latter two pollutants adjusted to reflect their global warming impact relative to CO_2. The emission impacts are shown in Tables 5 and 6. As can be seen, the impacts are relatively small in 2021 as only one model year of vehicle sales is affected. The emission impacts grow over time as more model years of sales are affected by the relaxation.

Table 5: Nationwide Lost Emissions Reductions if MY2020 standards Are Extended Indefinitely – Relative to Final MY2025 standards				
Calendar Year	CO_2e (thousand Metric tons per year)	VOC (U.S. tons per year)	NOx (U.S. tons per year)	PM2.5 (U.S. tons per year)
2021	6,830	3,864	1,051	168
2025	60,241	33,617	9,276	1,458
2030	137,474	76,308	20,899	3,302
2035	198,526	109,781	29,819	4,742
2040	241,510	133,233	36,023	5,746
2045	273,712	150,806	40,702	6,498
2050	303,158	166,924	45,019	7,190

Table 6: Nationwide Lost Emissions Reductions if MY2025 Standards Are Weakened by 50% - Relative to Final MY2025 standards				
Calendar Year	CO2e (thousand Metric tons per year)	VOC (U.S. tons per year)	NOx (U.S. tons per year)	PM2.5 (U.S. tons per year)
2021	5,190	2,984	811	130
2025	35,579	20,336	5,585	882
2030	74,992	42,693	11,611	1,846
2035	105,744	59,966	16,167	2,587
2040	127,239	71,996	19,315	3,100
2045	143,721	81,234	21,755	3,495
2050	159,027	89,840	24,044	3,864

As mentioned above, the above impacts include two factors that increase emissions, less stringent vehicular CO_2 standards and increased gasoline production, and one factor which

reduces emissions, lower VMT due to higher driving costs. The impact of the two factors which increase emissions far outweigh the impact of lower VMT. Tables 7 and 8 show the decreased levels of emissions from the VMT rebound effect. Please note that the figures shown are reductions in emissions, not increases, as is the case in Tables 5 and 6. (Please note that the impacts presented in Tables 5 and 6 do include the VMT impacts presented in Tables 7 and 8.)

Table 7: Nationwide Emission Decreases Due to Reduced Driving: 2020 Standard Extended Indefinitely				
Calendar Year	CO2e (thousand Metric tons per year)	VOC (U.S. tons per year)	NOx (U.S. tons per year)	PM2.5 (U.S. tons per year)
2021	592	76	100	4
2025	4,771	650	733	37
2030	10,229	1,697	1,884	103
2035	14,344	2,796	3,062	171
2040	17,133	3,664	3,961	229
2045	18,860	4,302	4,601	272
2050	19,714	4,845	5,151	307

Table 8: Nationwide Emission Decreases Due to Reduced Driving: Reduced Rate of Increased Stringency				
Calendar Year	CO2e (thousand Metric tons per year)	VOC (U.S. tons per year)	NOx (U.S. tons per year)	PM2.5 (U.S. tons per year)
2021	462	59	78	3
2025	3,056	417	477	24
2030	6,198	1,031	1,160	62
2035	8,570	1,665	1,835	102
2040	10,186	2,159	2,344	136
2045	11,192	2,525	2,709	161
2050	11,693	2,839	3,026	181

Attachment D - Comparison of EPA and NHTSA Peer Reviewed Papers

Summary: The following tables include peer reviewed studies relevant to the midterm evaluation that were performed by, published by, and/or contracted with the Environmental Protection Agency (EPA) and the National Highway Safety Administration (NHTSA), and/or the two agencies' employees.

The studies were identified by reviewing the Draft Technical Assessment Report and its appendices, supporting documents for the proposed and final determination, EPA's webpage listing its peer review publications relevant to the midterm evaluation,[242] and NHTSA's webpage listing its peer reviewed publications relevant to the midterm evaluation.[243]

The tables include the study's title, authors, publication numbers and information, links to the study and peer review process information, as well as date.

Studies are shaded to indicate different characteristics:

- No highlighting: performed by agency employees and published by an external source.
- Turquoise: funded, contracted or sponsored by the agency and published by the agency.
- Orange: performed by the agency and/or agency employees and published by the agency.
- Yellow: contracted or sponsored by the agency and published by an external source.

Peer Reviewed Studies: EPA

Study	Authors	Publication	Process/Link	Date
Developing the AC17 Efficiency Test for Mobile Air Conditioners	Fred Sciance, Brian Nelson, Mahmoud Yassine, Angelo Patti, Leela Rao	SAE Technical Paper 2013-01-0569	Link to study: http://papers.sae.org/2013-01-0569/ Link to information about the peer review process of the source: http://papers.sae.org/ ("SAE Technical Papers are written and peer-reviewed by experts in the automotive, aerospace, and	4/8/13

[242] Available at https://www.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-greenhouse-gas#TAR.

[243] Note that the webpage's link to the relevant peer review studies did not work, but I looked through the webpage itself found at https://one.nhtsa.gov/Laws-&-Regulations/CAFE-%E2%80%93-Fuel-Economy/ci.ld%E2%80%93cafe%E2%80%93midterm%E2%80%93evaluation%E2%80%932022%E2%80%9325.print#publications.

			commercial vehicle industries.")	
Maneuver-Based Battery-in-the-Loop Testing-Bringing Reality to Lab	Oguz H. Dagci, Nicolas Pereira, Jeff Cherry	SAE Int. J. Alt. Power., SAE Technical Paper 2013-01-0157	Link to study: http://papers.sae.org/2013-01-0157/ Link to information about the peer review process of the source: http://subs.sae.org/e-journal-08/ (The SAE International Journal of Alternative Powertrains provides a forum for peer-reviewed scholarly publication of original research and review papers that address challenges and present opportunities in alternative and electric powertrains and propulsion technology.")	4/8/13
Development of Advanced Light-Duty Powertrain and Hybrid Analysis Tool	Byungho Lee, SoDuk Lee, Jeff Cherry, Anthony Neam, James Sanchez, Ed Nam	SAE Technical Paper 2013-01-0808	Link to study: http://papers.sae.org/2013-01-0808/ Link to information about the peer review process of the source: http://papers.sae.org/ ("SAE Technical Papers are written and peer-reviewed by experts in the automotive, aerospace, and commercial vehicle industries.")	4/8/13
Modeling and Validation of Power-Split and P2 Parallel Hybrid Electric Vehicles	SoDuk Lee, Byungho Lee, Joseph McDonald, L. James Sanchez, Edward Nam	SAE Technical Paper 2013-01-1470	Link to study: http://papers.sae.org/2013-01-1470/ Link to information about the peer review process of the source: http://papers.sae.org/ ("SAE Technical Papers are written and peer-reviewed by experts in the automotive, aerospace, and commercial vehicle industries.")	4/8/13

Modeling and Validation of Lithium-Ion Automotive Battery Packs	SoDuk Lee, Byungho Lee, Joseph McDonald, Edward Nam	SAE Technical Paper 2013-01-1539	Link to study: http://papers.sae.org/2013-01-1539/ Link to information about the peer review process of the source: http://papers.sae.org/ ("SAE Technical Papers are written and peer-reviewed by experts in the automotive, aerospace, and commercial vehicle industries.")	4/8/13
Cost-Effectiveness of a Lightweight Design for 2017-2020: An Assessment of a Midsize Crossover Utility Vehicle	Cheryl Caffrey, Kevin Bolon, Hugh Harries, Greg Kolwich, Robert Johnston, Tim Shaw	SAE Technical Paper 2013-01-0656	Link to study: http://papers.sae.org/2013-01-0656/ Link to information about the peer review process of the source: http://papers.sae.org/ ("SAE Technical Papers are written and peer-reviewed by experts in the automotive, aerospace, and commercial vehicle industries.")	4/8/13
Potential Fuel Economy Improvements from the Implementation of cEGR and CDA on an Atkinson Cycle Engine	Charles Schenck and Paul Dekraker	SAE Technical Paper 2017-01-1016	Link to study: https://www.epa.gov/sites/production/files/2017-06/documents/sae-2017-01-1016-potential-fuel-economy-improvements-cegr-and-cda-on-atkinson-engine.pdf The (note - the bottom of the last page of the document provides information about the peer review process, "Engineering Meetings Board has approved this paper for publication. It has successfully completed SAE's peer review process under the supervision of the session organizer. This process requires a minimum of three (3) reviews by industry experts.")	3/28/17

Modeling and Validation of 12V Lead-Acid Battery for Stop-Start Technology	SoDuk Lee, Jeff Cherry, Michael Safoutin, Joseph McDonald	SAE Technical Paper 2017-01-1211	Link to study: https://www.epa.gov/sites/production/files/2017-06/documents/sae-2017-01-1211-modeling-validation-of-12v-lead-acid-battery-for-stop-start-technology.pdf (note - the bottom of the last page of the document provides information about the peer review process, "The Engineering Meetings Board has approved this paper for publication. It has successfully completed SAE's peer review process under the supervision of the session organizer. This process requires a minimum of three (3) reviews by industry experts.")	3/28/17
Fleet-Level Modeling of Real World Factors Influencing Greenhouse Gas Emission Simulation in ALPHA	Paul Dekraker, John Kargul, Andrew Moskalik, Kevin Newman, Mark Doorlag, and Daniel Barba	SAE Int. J. Fuels Lubr. 10(1):2017	Link to study: https://www.epa.gov/sites/production/files/2017-06/documents/sae-2017-01-0899-fleet-level-modeling-real-world-factors-influencing-greenhouse-gas-emission-simulation-in-alpha.pdf Link to information about peer review process: http://subs.sae.org/e-journal-04/	3/28/17
Characterizing Factors Influencing SI Engine Transient Fuel Consumption for Vehicle Simulation in ALPHA	Paul Dekraker, Mark Stuhldreher, Youngki Kim	SAE Int. J. Engines, SAE Technical Paper 2017-01-0533	Link to study: https://www.epa.gov/sites/production/files/2017-06/documents/sae-2017-01-0533-characterizing-factors-influencing-si-engine-transient-fuel-consumption-alpha.pdf Link to peer review information: http://subs.sae.org/e-journal-03/ (*SAE International Journal of Engines* is a scholarly, peer-reviewed research journal dedicated to internal combustion engine science and engineering.")	3/28/17

The Energy Efficiency Gap in EPA's Benefit-Cost Analysis of Vehicle Greenhouse Gas Regulations: A Case Study	Gloria Helfand and Reid Dorsey-Palmateer	Journal of Benefit-Cost Analysis, Cambridge University Press	Link to study: https://www.cambridge.org/core/journals/journal-of-benefit-cost-analysis/article/energy-efficiency-gap-in-epas-benefitcost-analysis-of-vehicle-greenhouse-gas-regulations-a-case-study/21A55026616C7C17496A56783F64FA3D	7/10/15
Air Flow Optimization and Calibration in High-Compression Ratio Naturally Aspirated SI Engines with Cooled-EGR	SoDuk Lee, Charles Schenk, and Joseph McDonald	SAE Technical Paper 2016-01-0565	Link to study: https://www.epa.gov/sites/production/files/2016-10/documents/2016-01-0565-air-flow-optim-calib-nat-asp-eng_0.pdf ("The Engineering Meetings Board has approved this paper for publication. It has successfully completed SAE's peer review process under the supervision of the session organizer. This process requires a minimum of three (3) reviews by industry experts.")	4/5/16
Cost-Effectiveness of a Lightweight Design for 2020-2025: An Assessment of a Light-Duty Pickup Truck	Cheryl Caffrey, Kevin Bolon, Greg Kolwich, Robert Johnston, Timothy Shaw	SAE Technical Paper 2015-01-0559	Link to study: https://www.epa.gov/sites/production/files/2016-10/documents/2015-01-0559_0.pdf ("The Engineering Meetings Board has approved this paper for publication. It has successfully completed SAE's peer review process under the supervision of the session organizer. This process requires a minimum of three (3) reviews by industry experts.") Additionally, the study was funded by EPA but also received financial contributions from the International Council on Clean Transportation (ICCT), and technical support by the Aluminum Association. FEV North America, Inc subcontracted with EDAG, Inc. and Munro and Associates, Inc. FEV, EDAG and Munro teams worked on the study. EDAG team also included vehicle instrumentation and data gathering for the vehicle for use in NVH, CAE, durability and vehicle	4/14/15

			dynamics analyses.	
Analysis of Technology Adoption Rates in New Vehicles	Aaron Hula, Jeffrey Alson, Amy Bunker, and Kevin Bolon	SAE Technical Paper 2014-01-0781	Link to study: https://www.epa.gov/sites/production/files/2016-10/documents/2014-01-0781_0.pdf ("The Engineering Meetings Board has approved this paper for publication. It has successfully completed SAE's peer review process under the supervision of the session organizer. This process requires a minimum of three (3) reviews by industry experts.")	4/1/14
Estimating GHG Reduction from Combinations of Current Best-Available and Future Powertrain and Vehicle Technologies for a Midsized Car Using EPA's ALPHA Model	John Kargul, Andrew Moskalik, Daniel Barba, Kevin Newman, and Paul Dekraker	SAE Technical Paper 2016-01-0910	Link to study: https://www.epa.gov/sites/production/files/2016-10/documents/2016-01-0910-estimate-ghg-red-using-alpha_0.pdf ("The Engineering Meetings Board has approved this paper for publication. It has successfully completed SAE's peer review process under the supervision of the session organizer. This process requires a minimum of three (3) reviews by industry experts.")	4/5/16

Modeling of a Conventional Mid-Size Car with CVT Using ALPHA and Comparable Powertrain Technologies	Kevin A. Newman, Mark Doorlag, and Daniel Barba	SAE Technical Paper 2016-01-1141	Link to study: https://www.epa.gov/sites/production/files/2016-10/documents/2016-01-1141-model-mid-size-car-w-cvt-using-alpha_0.pdf ("The Engineering Meetings Board has approved this paper for publication. It has successfully completed SAE's peer review process under the supervision of the session organizer. This process requires a minimum of three (3) reviews by industry experts.")	4/5/16
Modeling the Effects of Transmission Gear Count, Ratio Progression, and Final Drive Ratio on Fuel Economy and Performance Using ALPHA	Kevin A. Newman and Paul Dekraker	SAE Technical Paper 2016-01-1143	Link to study: https://www.epa.gov/sites/production/files/2016-10/documents/2016-01-1143-model-trans-gear-count-ratio-prog-final-drive-ratio-using-alpha_0.pdf ("The Engineering Meetings Board has approved this paper for publication. It has successfully completed SAE's peer review process under the supervision of the session organizer. This process requires a minimum of three (3) reviews by industry experts.")	4/5/16
Development and Testing of an Automatic Transmission Shift Schedule Algorithm for Vehicle Simulation	Kevin Newman, John Kargul, and Daniel Barba	SAE Int. J. Engines 8(3):2015	Link to study: https://www.epa.gov/sites/production/files/2016-10/documents/2015-01-1142_0.pdf Link to information about peer review process: http://subs.sae.org/e-journal-03/ ("SAE International Journal of Engines is a scholarly, peer-reviewed research journal dedicated to internal combustion engine science and engineering.")	6/15

Benchmarking and Modeling of a Conventional Mid-Size Car Using ALPHA	Kevin Newman, John Kargul, and Daniel Barba	SAE Technical Paper 2015-01-1140	Link to study: https://www.epa.gov/sites/production/files/2016-10/documents/2015-01-1140_0.pdf ("The Engineering Meetings Board has approved this paper for publication. It has successfully completed SAE's peer review process under the supervision of the session organizer. This process requires a minimum of three (3) reviews by industry experts." Additionally, GM's Global Energy Analysis, Execution and Tools team and GM's Public Policy Center team met with EPA to discuss technical work associated with the near final draft of this SAE paper.)	4/14/15
Fuel Efficiency Mapping of a 2014 6-Cylinder GM EcoTec 4.3L Engine with Cylinder Deactivation	Mark Stuhldreher	SAE Technical Paper 2016-01-0662	Link to study: https://www.epa.gov/sites/production/files/2016-10/documents/2016-01-0662-fuel-eff-map-2014-6cyl-gm-eco-tec-4.3l-eng-cyl-deac_0.pdf ("The Engineering Meetings Board has approved this paper for publication. It has successfully completed SAE's peer review process under the supervision of the session organizer. This process requires a minimum of three (3) reviews by industry experts.")	4/5/16
Benchmarking and Hardware-in-the-Loop Operation of a 2014 MAZDA SkyActiv 2.0L 13:1 Compression Ratio Engine	Benjamin Ellies, Charles Schenk, and Paul Dekraker	SAE Technical Paper 2016-01-1007	Link to study: https://www.epa.gov/sites/production/files/2016-10/documents/2016-01-1007-benchmark-hil-operat-2014-mazda-skyactiv-2.0l.pdf ("The Engineering Meetings Board has approved this paper for publication. It has successfully completed SAE's peer review process under the supervision of the session organizer. This process requires a minimum of three (3) reviews by industry experts.")	4/5/16

Investigating the Effect of Advanced Automatic Transmissions on Fuel Consumption Using Vehicle Testing and Modeling	Andrew Moskalik, Aaron Hula, Daniel Barba, and John Kargul	SAE Int. J. Engines 9(3):2016	Link to study: http://papers.sae.org/2016-01-1142/ Link to information on peer review process: http://subs.sae.org/e-journal-03/ ("SAE International Journal of Engines is a scholarly, peer-reviewed research journal dedicated to internal combustion engine science and engineering.")	9/16
Downsized Boosted Engine Benchmarking and Results	Mark Stuhldreher, Charles Schenk, Jessica Brakora, David Hawkins, Andrew Moskalik, and Paul DeKraker	SAE Technical Paper 2015-01-1266	Link to study: https://www.epa.gov/sites/production/files/2016-10/documents/2015-01-1266_0.pdf ("The Engineering Meetings Board has approved this paper for publication. It has successfully completed SAE's peer review process under the supervision of the session organizer. This process requires a minimum of three (3) reviews by industry experts.")	4/14/15
Vehicle Component Benchmarking Using a Chassis Dynamometer	Andrew Moskalik, Paul Dekraker, John Kargul, and Daniel Barba	SAE Int. J. Mater. Manf. 8(3):2015	Link to study: https://www.epa.gov/sites/production/files/2016-10/documents/2015-01-0589_0.pdf Link to information about peer review process: http://subs.sae.org/e-journal-05/ ("The SAE International Journal of Materials and Manufacturing publishes peer-reviewed, authoritative, and in-depth research in the areas of materials, design, and manufacturing.")	4/14/15
HIL Development and Validation of Lithium-Ion Battery Packs	SoDuk Lee, Jeff Cherry, Byungho Lee, Joseph McDonald, and Michael Safoutin	SAE Technical Paper 2014-01-1863	Link to study: https://www.epa.gov/sites/production/files/2016-11/documents/sae-2014-01-1863.pdf ("The Engineering Meetings Board has approved this paper for publication. It has successfully completed SAE's peer review process under the supervision of the session organizer. This	4/1/14

			process requires a minimum of three (3) reviews by industry experts.")	
Significant Fuel Savings and Emission Reductions by Improving Vehicle Air Conditioning	John P. Rugh, Valerie Hovland, and Stephen O. Andersen	NREL/CP-5400-62232	Link to study: http://nrel-primo.hosted.exlibrisgroup.com/primo_library/libweb/action/search.do;jsessionid=0869F1078359988850AE277CA0EA619E?fn=search&ct=search&initialSearch=true&mode=Basic&tab=default_tab&indx=1&dum=true&srt=rank&vid=Pubs&frbg=&vl%28freeText0%29=Significant+Fuel+Savings+and+Emission+Reductions+by+Improving+Vehicle+Air+Conditioning&scp.scps=scope%3A%28PUBS%29%2Cscope%3A%28NREL_INTERNAL%29&vl%28870446075UI1%29=all_items (note on EPA's involvement with study: "work was supported by DOE's Office of FreedomCAR and Vehicle Technologies (OFCVT) and the U.S. EPA")	04/15/04
Incremental CH4 and N2O mitigation benefits consistent with the U.S. Government's SC-CO2 estimates	Alex L. Marten, Elizabeth A. Kopits, Charles W. Griffiths, Stephen C. Newbold, Ann Wolverton	Taylor & Francis Group, Climate Policy, Volume 15, Issue 2, DOI: 10.1080/14693062.2014.912981	Link to study: http://www.tandfonline.com/doi/full/10.1080/14693062.2014.912981?scroll=top&needAccess=true Link to information on peer review process: http://www.tandfonline.com/action/journalInformation?show=aimsScope&journalCode=tcpo20 ("All manuscript submissions are subject to initial appraisal by the Editors, and, if found suitable for further consideration, to peer review by independent, anonymous expert referees. Peer review is typically	05/20/14

			double blind. Submission is online via ScholarOne. The Editors may require further changes after peer-review, and their decision on publication is final.")	
Characterizing the PM2.5-related health benefits of emission reductions for 17 area and mobile emission sectors across the U.S	Neal Fann, Kirk R. Baker, Charles M. Fulcher,	Elsevier, Environment International, 49	Link to study: https://ac.els-cdn.com/S0160412012001985/1-s2.0-S0160412012001985-main.pdf?_tid=36213586-a3bf-11e7-bdc8-00000aab0f02&acdnat=1506542910_cdfba26de0591647cfa69829144eadd0	09/28/12
Estimating the direct rebound effect for on-road freight transportation	James J. Winebrake, Erin H. Green, Bryan Comer, James J. Corbett, Sarah Froman	Energy Policy 48	Link to study: https://ac.els-cdn.com/S0301421512004302/1-s2.0-S0301421512004302-main.pdf?_tid=5e080d20-a380-11e7-a981-00000aacb360&acdnat=1506515919_4d9e3c1e4e285fc468e21ed5c6b7c7c8 (note about EPA's involvement: "authors gratefully acknowledge the support and comments received on earlier drafts of this paper by Sharyn Lie, Jefferson Cole, and Michael Shelby, all with the EPA;") Link to information on peer review process: https://www.journals.elsevier.com/energy-policy ("Energy Policy is an international	2012

			peer-reviewed journal addressing the policy implications of energy supply and use from their economic, social, planning and environmental aspects")	
The Effect of Environmental Regulation on Power Sector Employment: Phase I of the Title IV SO2 Trading Program	Ann Ferris, Ronald J. Shadbegian and Ann Wolverton	Journal of the Association of Environmental and Resource Economists 1(4)	Link to study: https://www.researchgate.net/publication/270571325_The_Effect_of_Environmental_Regulation_on_Power_Sector_Employment_Phase_I_of_the_Title_IV_SO2_Trading_Program	12/2014
Can Transportation Emission Reductions be achieved autonomously?	Karl Simon, Jeff Alson, Lisa Snapp, and Aaron Hula	American Chemical Society, Environ. Sci. Technol., 2015, 49 (24)	Link to study: http://pubs.acs.org/doi/pdf/10.1021/acs.est.5b05396 (note on peer review process – "Manuscripts are initially reviewed by the editor and, if appropriate, by other scientists who assess the significance, originality, and validity of the work, as well as its appropriateness for publication.")	11/23/15

Effect of Current and SOC on Round-Trip Energy Efficiency of Lithium-Iron Phosphate (LiFePO4) Battery Pack	Michael Safoutin, Jeff Cherry, Joseph McDonald, SoDuk Lee	SAE Technical Paper 2015-01-1186	Link to study: http://papers.sae.org/2015-01-1186/ Link to information about the peer review process of the source: http://papers.sae.org/ ("SAE Technical Papers are written and peer-reviewed by experts in the automotive, aerospace, and commercial vehicle industries.")	4/14/15
Critical factors affecting life cycle assessments of material choice for vehicle mass reduction	Troy Hottle, Cheryl Caffrey, Joseph McDonald, Rebecca Dodder	Transportation Research Part D 56 (2017) 241-257	Link to study: https://ac.els-cdn.com/S1361920916309142/1-s2.0-S1361920916309142-main.pdf?_tid=77bb726a-a912-11e7-b4e8-00000aab0f27&acdnat=1507128424_223c93c19aa92019503e402afb5c951c	08/2017
Ultrafine Particle Metrics and Research Considerations: Review of the 2015 UFP Workshop	Richard W. Baldauf, Robert B. Devlin, Peter Gehr, Robert Giannelli, Beth Hassett-Sipple, Heejung Jung, Giorgio Martini, Joseph McDonald, Jason D. Sacks, and Katherine Walker	International Journal of Environmental Research and Public Health, Volume 13, Issue 11	Link to paper: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5129264/ Link to information about the peer review process of the source: http://www.mdpi.com/journal/ijerph/about ("International Journal of Environmental Research and Public Health (IJERPH) (ISSN 1660-4601) is a peer-reviewed scientific journal that publishes original articles, critical reviews, research notes, and short communications in the interdisciplinary area of environmental health sciences and public health.") (note about paper – this is a conference report from an EPA sponsored workshop)	28/10/16

Modeling the Cost and Performance of Lithium-Ion Batteries for Electric-Drive Vehicles	Argonne National Laboratory Chemical Sciences and Engineering Division	Prepared for EPA under Contract No.: DE-AC02-06CH11357	Link to report: https://permanent.access.gpo.gov/gpo42158/ZyPDF.pdf Link to peer review of the report: https://nepis.epa.gov/Exe/ZyNET.exe/P100F17H.txt?ZyActionD=ZyDocument&Client=EPA&Index=2011%20Thru%202015&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&UseQField=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5CZYFILES%5CINDEX%20DATA%5C11THRU15%5CTXT%5C00000005%5CP100F17H.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=5	08/2012
Computer Simulation of Light-Duty Vehicle Technologies for Greenhouse Gas Emission Reduction in the 2020-2025 Timeframe	Prepared by Ricardo, Inc. and Systems Research and Applications Corporation (SRA), under EPA Contract No. EP-C-11-007, Work Assignment No. 0-12	EPA Report No.: EPA-420-R-11-021	Link to study: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100D57R.PDF?Dockey=P100D57R.PDF Link to peer review response document/description: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100D5BX.PDF?Dockey=P100D5BX.PDF	12/2011
The Rebound Effect from Fuel Efficiency Standards: Measurement and Projection to 2035	Kenneth A. Small and Kent Hymel; prepared under EPA Contract No. EP-W-08-018, Work Assignment No. 4-5	EPA Report No.: EPA-420-R-15-012	Link to study: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100N11T.PDF?Dockey=P100N11T.PDF Link to peer review response document/description: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100N141.PDF?Dockey=P100N14	07/2015

			1.PDF	
Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2014	EPA	EPA Report No.: EPA 430-R-16-002	Link to study: https://www.epa.gov/sites/production/files/2016-04/documents/us-ghg-inventory-2016-main-text.pdf (note – the study/report describes the review the it underwent on the third page of the document under the header "Acknowledgements" but does not state that it went through a formal peer review process)	04/15/16
Searching for Hidden Costs: A Technology-Based Approach to the Energy Efficiency Gap in Light-Duty Vehicles	Jean-Marie Revelt, Gloria Helfand, Lawrence Reichle, Kevin Bolon, Michael McWilliams, Mandy Sha, Amanda Smith, Robert Beach	EPA Document No.: EPA-420-D-15-010 Elsevier, Energy Policy Publication No.: Energy Policy Volume 98	Link to EPA presentation/document: https://www.epa.gov/sites/production/files/2016-10/documents/search-hidden-costs-te3-2015-11-03.pdf Link to publication in Energy Policy Journal: http://ac.els-cdn.com/S0301421516304803/1-s2.0-S0301421516304803-main.pdf?_tid=3fb9e300-9cb1-11e7-be57-00000aacb360&acdnat=1505767255_a845ed8fdf224afd244c0e1d4228778a (note – Jean-Marie Revelt is not listed as an author in this publication; additionally, under "Acknowledgements" it states that "RTI International conducted the content analysis under EPA contract EP-C-11-045, WA 3-01"; additionally, NHTSA commented on the study) Link to information about Energy Policy's peer review process: https://www.journals.elsevier.com/e	EPA Document Date: 2015, Energy Policy Date: 9/14/16

			nergy-policy ("Energy Policy is an international peer-reviewed journal addressing the policy implications of energy supply and use from their economic, social, planning and environmental aspects")	
Testing a Model of Consumer Vehicle Purchases	Gloria Helfand, Changzheng Liu, Marie Donahue, Jacqueline Doremus, Ari Kahan, and Michael Shelby	EPA Report No.: EPA-420-D-15-011	Link to study: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100NNOZ.PDF?Dockey=P100NNOZ.PDF (note – this is a draft of the study, and does not appear to have gone under a peer review process, but the following link suggests that it has been submitted to the Transportation Research Journal, an Elsevier publication: https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=309537)	12/2015

Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2014	Jeff Alson, Aaron Hula, and Amy Bunker	EPA Report No.: EPA-420-R-14-023a	Link to study/report: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100LQ9M.PDF?Dockey=P100LQ9M.PDF (note – the study/report describes the review the it underwent (NHTSA reviewed and commented on the report) at the end of the document under the header "Authors and Acknowledgements" but does not state that it went through a formal peer review process)	10/2014
Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 through 2015	Jeff Alson, Aaron Hula, and Amy Bunker	EPA Report No.: EPA-420-R-15-001	Link to study/report: https://nepis.epa.gov/Exe/ZyPdf.cgi?Dockey=P100O5P6.pdf (note – the study/report describes the review the it underwent (NHTSA reviewed and commented on the report) at the end of the document under the header "Authors and Acknowledgements" but does not state that it went through a formal peer review process) Additional link to other documents related to the study: https://www.epa.gov/fuel-economy-trends/download-co2-and-fuel-economy-trends-report-1975-2015	12/2015
Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2016	Jeff Alson, Aaron Hula, Amy Bunker, and Andrea Maguire	EPA Report No.: EPA-420-R-16-010	Link to study/report: https://www.epa.gov/sites/production/files/2016-11/documents/420r16010.pdf (note – the study/report describes the review the it underwent (NHTSA reviewed and commented on the report) at the end of the document under the header "Authors and Acknowledgements" but does not state that it went through a formal peer review process)	11/2016

How Consumers Value Fuel Economy: A Literature Review	David Greene; EPA contracted with RTI International to conduct peer review of literature survey conducted by Greene	EPA Report No.: EPA-420-R-10-008 EPA Contract No.: DE-AC05-00OR22725	Link to study: https://nepis.epa.gov/Exe/ZyPDF.cgi/P1006V0O.PDF?Dockey=P1006V0O.PDF Link to peer review response document/description: https://nepis.epa.gov/Exe/ZyPDF.cgi/P1006WFR.PDF?Dockey=P1006WFR.PDF	03/2010
Light Duty Technology Cost Analysis, Power-Split and P2 Hybrid Electric Vehicle Case Studies	FEV, Inc.	EPA Report No.: FEV07-069-303 EPA Contract No.: EP-C-07-069, Work Assignment No. 3-3	Link to study: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100EG1R.PDF?Dockey=P100EG1R.PDF Link to peer review response documents/description: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100CVJS.PDF?Dockey=P100CVJS.PDF https://nepis.epa.gov/Exe/ZyPDF.cgi/P100CVM8.PDF?Dockey=P100CVM8.PDF	10/10/11
Light-Duty Vehicle Mass Reduction and Cost Analysis -- Midsize Crossover Utility Vehicle	FEV, Inc.	EPA Report No.: EPA-420-R-12-026 EPA Contract No.: EP-C-12-014, Work Assignment No. 0-3	Link to study: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100EWVL.PDF?Dockey=P100EWVL.PDF Link to peer review response document/description: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100EW1M.PDF?Dockey=P100EW1M.PDF	08/2012
Mass Reduction and Cost Analysis - Light Duty Pickup Truck Model years 2020-2025	FEV North America, Inc.	EPA Report No.: EPA-420-R-15-006 EPA Contract No.: EP-C-12-014 WA3-03	Link to study: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100MS0E.PDF?Dockey=P100MS0E.PDF (note – information about peer review process is on page 967)	06/08/15

Automobile Industry Retail Price Equivalent and Indirect Cost Multipliers	RTI International and Transportation Research Institute, University of Michigan	EPA Report No.: EPA-420-R-09-003 RTI Project Number 0211577.002.004	Link to study: https://nepis.epa.gov/Exe/ZyNET.exe/P100AGJ1.txt?ZyActionD=ZyDocument&Client=EPA&Index=2006%20Thru%202010&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&UseQField=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5CZYFILES%5CINDEX%20DATA%5C06THRU10%5CTXT%5C00000025%5CP100AGJ1.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=2 (note – information about peer review process is found on the second page of the document)	02/2009
Using indirect cost multipliers to estimate the total cost of adding new technology in the automobile industry	Alex Rogozhin, Michael Gallaher, Gloria Helfand, Walter McManus	Elsevier, International Journal of Production Economics 124	Link to study: https://ac.els-cdn.com/S0925527309004344/1-s2.0-S0925527309004344-main.pdf?_tid=14e4c294-a45e-11e7-9768-00000aab0f6c&acdnat=1506611144_1c4c1bc75b28791762b6e7b686983a6a (note – paper is based on a study conducted by RTI International for the U.S. Environmental Protection	3/12/2009

			Agency)	
Consumer Vehicle Choice Model Documentation	Oak Ridge National Laboratory	EPA Report No.: EPA-420-B-12-052 EPA Contract No.: DE-AC05-000R22725	Link to study: https://nepis.epa.gov/Exe/ZyNET.exe/P100EZ37.TXT?ZyActionD=ZyDocument&Client=EPA&Index=2011+Thru+2015&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C11thru15%5CTxt%5C00000005%5CP100EZ37.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL	08/2012
The Energy Paradox and the Diffusion Conservation Technology	Adam B. Jaffe, Robert N. Stavins	Elsevier, Resource and Energy Economics 16(2)	Link to study: https://ac.els-cdn.com/0928765594900019/1-s2.0-0928765594900019-main.pdf?_tid=c9b5fef2-a2bc-11e7-9d6b-00000aab0f01&acdnat=1506431918_b14a803ebc0c6d36562a78a820c21450; (note – study received funding from EPA)	1994

Population and Activity of On-road Vehicles in MOVES2014	EPA	EPA Report No.: EPA-420-R-16-003	Link to study: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100O7VJ.pdf (note – peer review information is found on page 144)	01/2016
Rebound 2007: Analysis of U.S. light-duty vehicle travel statistics	David L. Greene	Elsevier, Energy Policy, vol. 41	Link to study: https://ac.els-cdn.com/S0301421510002739/1-s2.0-S0301421510002739-main.pdf?_tid=b9bd505a-a464-11e7-a395-00000aab0f01&acdnat=1506614006_190835103c6d2f3277ef804bbba8dfa8 (note about EPA involvement – "the research presented in this paper was sponsored by the U.S. Environmental Protection Agency, Office of Transportation and Air Quality" Link to peer review information about journal: https://www.journals.elsevier.com/energy-policy ("Energy Policy is an international peer-reviewed journal addressing the policy implications of energy supply and use from their economic, social, planning and environmental aspects")	04/20/10
Identifying the Elasticity of Driving: Evidence from a Gasoline Price Shock	Kenneth Gillingham	Elsevier, Regional Science & Urban Economics 47 (4)	Link to study: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.360.5791&rep=rep1&type=pdf (note about EPA involvement – "I thank… the US Environmental Protection Agency STAR Fellowship program… for the funding that made this research possible")	05/27/2013

The Rebound Effect for Automobile Travel: Asymmetric Response to Price Changes and Novel Features of the 2000s	Kent M. Hymel Kenneth A. Small	Elsevier, Energy Economics, 49 EPA Contract No.: EPW-08-018	Link to study: https://ac.els-cdn.com/S0140988314003338/1-s2.0-S0140988314003338-main.pdf?_tid=d6aaf482-a465-11e7-a22a-00000aab0f6b&acdnat=1506614484_b1db35a1dfe628b53c890aaa3887fa52	01/13/15

Peer Reviewed Studies: NHTSA

Concise Description of Auto Fuel Economy and Performance in Recent Model Years	A.C. Malliaris, H. Hsia, H. Gould	SAE Technical Paper 760045	Link to study: http://papers.sae.org/760045/	01/02/1976
Regression Analysis for Acceleration Performance of Light Duty Vehicles	Y.R. Young	Transportation Research Board DOT Report No.: DOT HS 807 763, NHTSA, DOT	Link to study: https://ntrl.ntis.gov/NTRL/dashboard/searchResults/titleDetail/PB92113778.xhtml Links to information about peer review process: https://trid.trb.org/view.aspx?id=363051 http://www.trb.org/Main/Blurbs/154702.aspx (note – although the Transportation Research Board Journal publications undergo a peer review process, it wasn't clear that this study was published in their journal and was subject to the same process)	09/1991

The impact of transportation on affordability	Diane Whitmore Schanzenbach and Leslie McGranahan	Housing and Transportation Affordability Index Prepared for DOT and HUD Commissioned by Manhattan Strategy Group	Link to study: http://www.locationaffordability.info/downloads/AutoCostResearch.pdf (note – although it does not state that it went through a formal peer review process, it does list report contributors and reviewers on the second page of the document)	11/2013
Mass Reduction for Light-Duty Vehicles for Model Years 2017–2025	Harry Singh	DOT Report No.: DOT HS 811 666	Link to study: ftp://ftp.nhtsa.dot.gov/CAFE/2017-25_Final/811666.pdf (note - information on peer review process is found on page 44)	08/2012
Assessment of Fuel Economy Technologies for Light-Duty Vehicles	National Research Council	The National Academies Press DOT Contract No.: DTNH22-07-H-00155	Link to study: https://www.nap.edu/read/12924/chapter/1#ii	2011
Cost, Effectiveness and Deployment of Fuel Economy Technologies for Light-Duty Vehicles	National Research Council	The National Academies Press DOT Contract No.: DTNH22-11-H-00352	Link to study: https://www.nap.edu/read/21744/chapter/1	2015

Vehicle Weight, Fatality Risk and Crash Compatibility of Model Year 1991-99 Passenger Cars and Light Trucks	Charles J. Kahane	DOT Report No.: DOT HS 809 662	Link to study: https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/809662 (note - under the "acknowledgments" section, v, it notes that this study was reviewed but did not undergo a formal peer review process)	10/2003
Methodology for evaluating fleet protection of new vehicle designs: Application to lightweight vehicle designs	R.R. Samaha, Priya Prasad, Dhafer Marzougui, Chongzen Cui, Kennerly Digges, Stephem Summers, Lixin Zhao, and Aida Barsan-Anelli,	DOT Report No.: Report No. DOT HS 812 051A	Link to study and peer review documents: https://one.nhtsa.gov/Laws-&-Regulations/CAFE-%E2%80%93-Fuel-Economy/ci.ld%E2%80%93cafe%E2%80%93midterm%E2%80%93evaluation%E2%80%932022%E2%80%9325.print (note – scroll down to "5. Systems modeling to assess the effects…" and click on the link below "Methodology for evaluating fleet protection…" – this is the only way I found to download the pdf documents)	08/2014
Growth in Motor Vehicle Ownership and Use: Evidence from the Nationwide Personal Transportation Survey	Don Pickrell, and Paul Shimeck	DOT, Journal of Transportation and Statistics, vol. 2	Link to study: https://ntl.bts.gov/lib/9000/9000/9098/1pickrell.pdf (note – although the article itself doesn't discuss the peer review process, the journal generally seems to undergo some kind of peer review (see the third page of the document): https://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/JTS%20Vol%2010%20N%201_Jan2014.pdf	05/1999
Effectiveness and Impact of Corporate Average Fuel Economy (CAFÉ) Standards	National Research Council	National Academies Press DOT Grant No.: DTNH22-00-G-02307	Link to study: https://www.nap.edu/read/10172/chapter/1	2002

Attachment E – EDF comments on CAR analysis

January 11, 2017

Ms. Gina McCarthy
Administrator
Environmental Protection Agency
Office of the Administrator, 1101A
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Mr. Christopher Lieske
Office of Transportation and Air Quality Assessment and Standards
Environmental Protection Agency
2000 Traverwood Drive
Ann Arbor, MI 48105

Submitted electronically to: www.regulations.gov

Docket ID Number: EPA-HQ-OAR-2015-0827

Reference: Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation

Subject: Response to "Corrections and clarifications to the various references to the Center for Automotive Research's ***The Potential Effects of the 2017-2025 EPA/NHTSA GHG/Fuel Economy mandates on the U.S. Economy*** as found on pp. A-41 through A-42; A-80 and A-87 and the Technical Support Document, pp. 4-17 through 4-20."

Dear Administrator McCarthy and Mr. Lieske:

This submission responds to comments by Dr. Jay Baron of the Center for Automotive Research (CAR), in which he defends the use of the CAR report, ***The Potential Effects of the 2017-2025 EPA/NHTSA GHG/Fuel Economy mandates on the U.S. Economy*** (the Report), as input into the review process of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation. In particular, Dr. Baron's response (the Response) does not adequately address EPA's critiques of the Report. Accordingly, we support EPA's conclusion that the Report's estimates on sales and employment impacts of the emissions and fuel economy standards are based on materially flawed analysis and thus EPA must not give it weight in the review process.

We first respond to the four corrections and clarifications that Dr. Baron presents in his defense of the Report, and go on to note the additional flaws in the analysis which are not addressed in the Response.

1. CAR's fuel efficiency costs are overestimated, and the costs are unclear if in real dollars or in nominal dollars as gasoline price is real dollars but the expenditures are nominal dollars.

The Response has not succeeded in providing any rationale for using its own cost estimates over those of EPA. The Response claims that estimates of the costs required to move from MY2017 to MY2025 fuel efficiency standards used in the Report, $2000, $4000 and $6000 (2015 dollars), are "not derived or based off of a 1991 study as the EPA reports." However, the Response does not give an alternative source for the cost estimates. In particular, the Response does not address EPA's critique that the cost estimates are not based on any technology analyses. These cost estimates provide the foundation of the Report - the complete lack of clarity around the derivation of the cost estimates thus invalidates any conclusions of the Report.

As further evidence that the Report's cost estimates are invalid, the $2000-6000 (2015 dollars) range is significantly higher than EPA's central cost estimate of $1287 (2013 dollars, equivalent to $1309 in 2015 dollars), which estimate is based on technology costs.[244] The Response notes that the Report's fuel efficiency cost scenarios are estimates of the per-vehicle cost to consumers, rather than to vehicle manufacturers, and thus cannot be directly compared to EPA's cost estimates. The Report uses a 1.84[245] retail price equivalence factor. However, contrary to the Response's suggestion, and as clearly stated in the Draft TAR, EPA's cost estimates *do* include either an Indirect Cost Multiplier or a Retail Price Equivalent, and thus are directly comparable. EPA's central cost estimate, $1309, uses an Indirect Cost Multiplier; use of a Retail Price Equivalent increases that cost estimate to $1560.[246] Thus, EPA's original point holds—even the

[244] The Response incorrectly cites EPA's cost estimates as $894 - $1,245. However, as stated on page ES-8 of the Draft Technical Assessment Report (TAR), these costs refer to "the average per-vehicle costs of meeting the MY2025 standards (**incremental to the costs already incurred to meet the MY2021 standard**)." (Emphasis added.) Since the Report's cost estimates are for moving from MY2017 to MY2025 standards, these costs are not directly comparable to EPA's $894-$1,245 range. As clearly stated on page 4-17 of EPA's Technical Support Document, the correct comparison cost is $1,287, taken from Table 12.44, p. 12-35 in the Draft TAR. Table 12.44 clearly states that the cost to go from MY 2016 standards to MY 2025 standards is $1287 (equal to the cost of bringing the fleet from MY2014 to MY2025 standards minus the cost of bringing the fleet from MY2014 to MY2016 standards; $1565 - $279).

[245] The Response incorrectly cites its own Report, claiming to use a 1.86 retail equivalence factor where in fact the Report uses a 1.84 retail equivalence factor (page 15, CAR, *The Potential Effects of the 2017-2025 EPA/NHTSA/Fuel Economy Mandates on the U.S. Economy*).

[246] The notes for Table 12.44, p. 12-35 in the Draft TAR point to Table 12.97 on p. 12-81 as the origin of the $1565 cost estimate. Table 12.97 gives a low estimate of $1565 and a high estimate of $1818 for the fleet per-vehicle average cost of moving from MY2014 to MY2025 standards. The notes state that the low estimate refers to an estimate which uses an indirect cost multiplier, and the high estimate refers to an estimate which uses a retail price equivalent. Subtracting the $279 for moving from MY2014 to MY2016 fuel efficiency requirements, and converting from 2013 dollars to 2015 dollars yields the range cited in the main text; $1309-$1566.

Report's low price impact scenario of $2000 is over 25% higher than EPA's highest cost estimate.

EPA should not, as the Response requests, "reference the CAR employment impact resulting from a $2,000 vehicle price increase," as those estimates would be based on flawed assumptions and analysis, and would almost certainly be overstated.

In response to EPA's critique that the Report is inconsistent throughout the Report in its use of dollar-year, CAR defends its use of nominal vs. real dollars in one particular instance. However, the lack of clarity and consistency around dollar-years is endemic throughout the Report. For instance, in Table 4 of the Report, fuel efficiency costs are stated in 2015 dollars, whereas gas prices (and thus savings due to fuel efficiency) are listed in 2010 dollars, which slightly biases results towards a higher Net Cost.

2. CAR used an undiscounted payback period of 3-years of the fuel savings instead of a discounted 5-year or lifetime fuel savings value.

The Response claims that discount rate studies were cited but not incorporated into the payback period which the Report used, because those studies did not include compounding periods. Thus, including them would require assumptions about compounding periods which could lead to a wide range of results.

We would argue that the uncertainty inherent in the discount rate for fuel efficiency, as well as in the payback period for fuel efficiency, is important to incorporate into any model which aims to determine the effect of fuel efficiency standards. Choosing just one payback period creates false certainty around the results. Moreover, in this particular case, including the full range of discount rates (and the full range of assumptions as to compounding periods) would likely increase the value of fuel savings to consumers.

Neither the Report nor the Response, in our view, sufficiently supports the choice to use a single payback period of 3 years throughout the analysis.

3. Econometric models appear to produce contradictory results of vehicle price effects on vehicle demand.

The CAR report uses two distinct econometric models to study the impact of vehicle prices on expenditures. One is used to estimate the elasticity of expenditures with respect to prices; the other is used to project baseline vehicle expenditures. These models use different data and different independent variables. The two models produce opposite results of the effect of price on expenditures.

The Response explains that the reason for the discrepancy in the coefficients on the two price variables, is that the first model uses real term data, whereas the second model uses nominal term data (because real vehicle prices discount technology costs which consumers may not perceive). In the second model, the positive relationship between price and expenditures is due, according to the Response, to inflation.

This Response is admitting an omitted variable (inflation, or time trend) which, along with other problems described further below, invalidates the results of the model. If the co-efficient on price in the second model is picking up the effect of other drivers, this calls into question the validity of the entire model. In addition, neither the Report nor the Response provide any reason for estimating two models of the same dependent variable (vehicle expenditures) with different sets of independent variables. One cannot simply pick and choose which variables to include as drivers in regression analysis, without apparent rationale.

4. CAR's employment impact analysis does not take substitution effect (new technologies, new material, and new processing) into account.

The Response claims that, since the Report estimates the own-price elasticity of total revenue (effect of changing price on revenue), they actually are including substitution and labor for new technologies in their employment estimate.

However, The Report does not show how it reached its estimates of auto industry jobs per vehicle produced, additional jobs per additional auto industry job, or additional jobs per dealer employment. In addition, EPA disagrees with the use of the 'multiplier' approach towards estimating employment impacts in the context of the U.S. economy. EPA suggests that the primary effect of regulation when unemployment is low is to move jobs between sectors, rather than create a net gain or loss. In addition, the process for determining employment within the auto industry (forecasting a production/employment index based solely on past trends with no empirical model) seems flawed.

Additional shortcomings of the Report which the Response does not address:

- The Report estimates the elasticity of vehicle expenditures with respect to price, and compares that with elasticities of sales volume with respect to price in the literature. However, these two elasticities are not directly comparable; in order to be comparable you would have to add '1' to CAR's elasticity of vehicle expenditures (which is price x quantity). If this is done, then the Report's estimated elasticity is significantly larger in absolute value than estimates in the literature, and not smaller as the Report inaccurately states. This means that the Report estimates a higher impact on expenditures, and thus a higher impact on vehicles sold, than would be estimated if demand elasticities from the literature were used.

- Both econometric models have expenditures as the dependent variable and price as an independent variable. Since price and expenditures (price x quantity) are not independent, these models violate the necessary assumptions of a linear regression model. Neither model captures the potential adjustment margin of vehicle type, and potentially conflates changing product mix with changes in vehicle sales. In addition, some of the independent variables used in the model are likely to be related, potentially biasing the results. The Report does not show any robustness tests or alternative specifications, and provides little to no evidence of the validity of their model.

In conclusion, the Response reveals a lack of basic understanding both of EPA's original analysis in their Draft Technical Assessment Report, and of EPA's critiques to the Report in the Proposed Determination and the Technical Support Document. The "corrections and clarifications" in the Response in no way address the significant shortcomings of the Report which EPA identified and described. Accordingly, EPA should not give weight to CAR's seriously flawed analysis in carrying out this review.

Respectfully submitted for the Record,

Katherine Rittenhouse
Economic Analyst

Matthew Zaragoza Watkins
High Meadows Senior Economist

Attachment F – Industry Announcements

- **Toyota and Mazda announce new company to develop electric cars.** Vehicles produced through the new company will use Toyota's modular platform architecture that's being used in models such as the Prius and 2018 Camry. Everything from small cars to SUVs are planned, according to the news release.[247]
- **Dyson to Spend £1 Billion Making 'Radical' Electric Car**. Founder James Dyson said the company will build an electric car by 2020. The company is investing one billion pounds ($1.34 billion) to develop the car, plus the same sum to create solid-state batteries to power it. While most companies are using lithium-ion batteries in their current models, Dyson said its car would use solid-state batteries that are smaller, more efficient, easier to charge and potentially easier to recycle.[248]
- **Mercedes-Benz plans to invest $1 billion in Alabama to produce electric vehicles**. The investment will go both to an expansion of the German luxury brand's existing plant near Tuscaloosa and to build a new 1 million-square-foot battery factory. Mercedes said it expects to add 600 new jobs in the Tuscaloosa area with the new investment. It will augment a $1.3 billion expansion of the facility announced in 2015 to add a new car body manufacturing shop and upgrade logistics and computer systems.[249]
- **Renault-Nissan-Mitsubishi bets on spike in electric cars**. The Renault-Nissan-Mitsubishi announced plans to produce 12 new electric models by 2022 and to make electric cars 30 percent of its overall output. The carmakers collectively sold more vehicles than any other company in the world in the first half of this year.[250]
- **BMW plans 25 all-electric and hybrid vehicles by 2025** – 12 all-electric cars and 13 hybrids. BMW said it will equip all of its factories to handle combustion engines, hybrid cars and electric cars by 2020.[251]
- **Jaguar Land Rover said its entire fleet of new vehicles will be electric or hybrid-electric starting in 2020.** The all-electric Jaguar I-Pace SUV goes on sale in 2018.[252]
- **VW says it will bring no fewer than 80 new electric vehicles to market globally by 2025**—a significant jump from the 30 it had promised in June 2016. Under the Roadmap E plan adopted by the company's board of directors, VW Group will spend more than €20

[247] https://www.theverge.com/2017/9/28/16379394/mazda-toyota-new-electric-car-company
[248] https://about.bnef.com/blog/dyson-to-spend-1-billion-making-radical-electric-car/
[249] https://www.usatoday.com/story/money/cars/2017/09/21/mercedes-benz-tuscaloosa-electric-vehicles-batteries/688721001/
[250] http://business.financialpost.com/pmn/transportation-business-pmn/autos-transportation-business-pmn/renault-nissan-promises-12-new-electric-vehicles-by-2022
[251] http://www.latimes.com/business/autos/la-fi-hy-bmw-jaguar-ev-20170907-story.html
[252] http://www.latimes.com/business/autos/la-fi-hy-bmw-jaguar-ev-20170907-story.html

billion ($24 billion) on plants and facilities for electric cars. The company said it will also solicit bids for contracts on more than €50 billion ($60 billion) of battery cells and packs.[253]

- **Aston Martin says it will go all-hybrid and EV by 2030**. By 2030, Aston Martin expects that EVs will account for 25 percent of its sales, with the rest of the lineup expected to be hybrids. The company will develop EV and hybrid tech in-house instead of licensing it from an allied automaker.[254]
- **Volvo moves to phase out conventional engines.** The company said that all the models it introduces starting in 2019 will be either hybrids or powered solely by batteries.[255]
- **G.M. Lays Out Plan for 20 Electric Models by 2023**. G.M. said it would introduce two new all-electric models within 18 months as part of a broader plan toward what the company says is the ultimate goal of an emissions-free fleet. The two models will be the first of at least 20 new all-electric vehicles that G.M. plans to bring out by 2023.[256]
- **Ford Adding Electrified F-150, Mustang, Transit by 2020.** Ford confirms seven of 13 new global electrified vehicles coming in the next five years, including F-150 Hybrid, Mustang Hybrid and Transit Custom plug-in hybrid. The automaker is investing $700 million and adding 700 direct new jobs in Flat Rock (Michigan) Assembly Plant to create a factory capable of producing high-tech electrified and autonomous vehicles.[257]

[253] http://www.greencarreports.com/news/1112856_vw-group-makes-300-models-globally-will-electrify-them-all-by-2030
[254] http://autoweek.com/article/luxury/aston-martin-says-it-will-go-all-hybrid-and-ev-2030-report-says
[255] https://www.nytimes.com/2017/07/05/business/energy-environment/volvo-hybrid-electric-car.html
[256] https://www.nytimes.com/2017/10/02/business/general-motors-electric-cars.html?_r=0
[257] https://media.ford.com/content/fordmedia/fna/us/en/news/2017/01/03/ford-adding-electrified-f-150-mustang-transit-by-2020.html

Message

From: Lieske, Christopher [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=C836C7DEA7054DD8807120A1D401CAC8-LIESKE, CHRISTOPHER]
Sent: 10/12/2017 3:04:49 PM
To: cwells@aluminum.org
Subject: Aluminum Association Midterm Evaluation Comments
Attachments: Ducker-Public-DAR-V6_PUBLIC.PDF

Hello Mr. Wells –

I am contacting you regarding your comments on EPA's Midterm Evaluation Reconsideration. Our docket staff asked that I reach out to you regarding one of the documents, attached, that the Aluminum Association submitted with their comments through regulations.gov. The document's pages are marked confidential and copyrighted, although the file name is marked "PUBLIC." Documents that are confidential are withheld from the public docket and documents that are copyrighted have restricted public access (they are not available to the public online through regulations.gov).

Could you please confirm whether the document, a presentation titled "Aluminum Content in North American Light Vehicles 2016 to 2018," Summary Report, July 2017, should be treated as confidential and withheld from the public docket, should be treated as not confidential but copyrighted with restricted public access, or should be treated as not confidential or copyrighted and released with full access to the public through regulations.gov?

Thank you and please let me know if you have any questions.

Chris

Chris Lieske
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ALUMINUM CONTENT IN NORTH AMERICAN LIGHT VEHICLES 2016 TO 2028

Summary Report

July 2017

This Report Has Been Prepared Solely For :

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INTRODUCTION AND METHODOLOGY

Ducker & Aluminum Association Project

- The Aluminum Association Auto & Light Truck Group (ATG) commissioned Ducker in October 2016 to determine the latest aluminum content in terms of net pounds per vehicle by vehicle and in aggregate for light vehicles produced in North America in CY 2016 through CY 2020 After 2020, Ducker agreed to provide a range of future aluminum sceanarios based on TAR

Data and Information Sources

- Ducker determined that in addition to our methodology of gathering the latest information and opinions on the future from our extensive internal database and network of OEMs and their suppliers, we would use all the latest data available from NHTSA, EPA and other sources such as the Center for Automotive Research (CAR) to establish an independent view of what the technology paths in TAR imply about weight savings by OEM, vehicle type and even specific vehicles beyond 2020
- The theoretical or top down analysis relies primarily on reports and databases provided by the EPA, NHTSA and CAR with insights and input from industry respondents throughout the supply chain

Process, Goals, and Objectives

- The goal of the top down analysis was to determine the weight savings* and material mix solutions implied by the latest government reports and their supporting documents and databases. The top down analysis examined the effect of fuel prices, vehicle mix, secondary weight savings, electrification, vehicle design and vehicle launch cadence on the amount of weight that is expected to be shed by vehicle type to reduce the MY 2015 average vehicle weight by 7% by MY 2025
- The top down analysis is not an attempt to predict what each OEM will do to meet the regulations. It provides a framework of what the regulators believe the OEMs could do to meet the regulations in the safest and most cost effective manner in the time period 2022 – 2025. Average weight savings and material forecasts are only valuable to create a frame work. Vehicle segment analysis and where possible, specific vehicle weight savings are the key to the success for both the top down and bottom up analyses. NHTSA and the EPA have established slightly different weight reduction goals for 2025 and beyond. The average of the targets amounts to a reduction of 270 net pounds per vehicle or 7% compared to the average vehicle weight of MY 2015. The NHTSA technology path to achieve 7% is highly vehicle specific, and was critical to the Ducker analysis of material substitution options after 2020
- The regulation driven weight reduction goals vary by type of vehicle and by OEM. Less than 25% of the vehicles have to contribute 50% of the total savings. Pickup trucks, large cars and SUVs, minivans and electric vehicles will bear most of the burden. Nearly 20% of the vehicles are likely to reduce mass by 20% while an equal number of vehicles are likely to reduce mass by less than 7.5% according to NHTSA Technology Path in Chapter 13 of the Technical Assessment Report (TAR)

**All weight savings references in the report are the direct savings from material substitution. Under the assumption that weight creep increases and secondary weight savings and engine resize weight decreases offset each other, the material sum after substitution is the equivalent of curb weight*

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EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY: 2020 HIGHLIGHTS

This study is organized in two segments, 2015 to 2020 and Scenarios beyond 2020

- Mass reduction initiatives are influenced by CAFE regulations, consumer preferences, fuel prices, and OEM objectives. The CAFE regulation through 2021 is firm and the other influencing factors are recognized by OEM and in near-term reflected vehicle programs. Most vehicle programs through 2020 have been finalized, or are nearing final production commitments. The 2015 to 2020 section is the result of a detailed "Bottom up" model and component analysis of production vehicle materials content
- CAFE regulations have a major impact on mass reduction initiatives. Regulations after 2021 are currently the subject of the "Mid-Term Review" process and will have a draft regulation expected in April 2018. Content and timing of different Fuel Economy, CO2 levels and timing of future levels are being considered by OEMS and Regulators. To address that uncertainty, Ducker evaluated potential automotive materials utilization under three different mass reduction and timing assumptions:

Current Proposed Regulation	7% *Mass Reduction by 2025
Most Likely OEM Compromise	7% *Mass Reduction by 2028
Market Driven Solution (no CAFE regulation)	4.5% *Mass Reduction by 2028

**-based on 2015 average curb mass of 3834 Lbs.*

- Ducker believes that future CAFE regulations will be within the range defined by these bounds

Major Findings – 2020

- Aluminum content forecast for 2015 to 2020:

	2015	2020
Average Aluminum Pounds per Vehicle	397	466
% Share of Curb Mass per Vehicle	10%	13%
Average Curb Mass Pounds per Vehicle	3835	3735

- Fifty percent of total aluminum content growth over the next five years will be driven by aluminum for closures, crash management, steering knuckles and structural vacuum die cast parts
- Aluminum content by vehicle segment in 2020 will range from 262 pounds per vehicle in the A/B segment passenger cars to over 550 pounds per vehicle for the average pickup truck. The average passenger car will contain 362 pounds of aluminum and the average light truck will contain 523 pounds of aluminum by 2020
- The average aluminum content for five OEMs in 2020 will be over 600 pounds per vehicle

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EXECUTIVE SUMMARY: 2020 HIGHLIGHTS

Sheet Growth Trends - 2020

- Aluminum sheet for closures is expected to increase from 23 pounds per vehicle in 2015 to 61 pounds per vehicle in 2020, or over 2.5 times in five years which is more growth for closures than expected
- Aluminum hood penetration will increase from 50% in 2015 to 71% in 2020. Penetration for doors will increase from less than 5% in 2015 to slightly over 25% 2020. Hoods will account for 25% of the of the total 2020 closure weight, and doors will be 43%. Other than the Tesla Model S, there were essentially no aluminum doors in North American produced vehicles prior to 2014
- At current production levels that equates to 1.06 million tons (or 2.1B lb.'s) of gross sheet consumption including process scrap (blanking scrap, stamping scrap, etc.). Aluminum sheet for Body-in-White (BIW) components is expected to increase from 14 pounds per vehicle in 2015 to 26 pounds per vehicle, an increase of 83% from 2015 to 2020. Closure and BIW sheet combined will reach 87 pounds per vehicle by 2020

Extrusion Growth Trends - 2020

- Total extruded product content including shapes, tube, rod and bar increases from 36 pounds per vehicle in 2015 to 49 pounds per vehicle in 2020. Aluminum extrusions for crash management parts are expected to increase by nearly six pounds per vehicle, up 65%. Extruded BIW components are expected to increase by 4.4 pounds or 100% by 2020. Bumper beam penetration will increase from 33% in 2015 to 54% in 2020

Casting / Forging Growth Trends - 2020

- Aluminum vacuum die castings (structural HPDC) for body components and sub-frames are expected to increase from 2.6 pounds per vehicle in 2015 to 14.4 pounds per vehicle in 2020, significantly more than expected
- Aluminum castings and forgings for steering knuckles will increase from 12.1 pounds per vehicle in 2015 to 16.4 pounds per vehicle in 2020 or 35% over the period
- Overall aluminum forgings grow from 7.9 pounds per vehicle in 2015 to 9.3 pounds per vehicle in 2020, while all casting content (HPDC, PM, Sand, others) will decline from 285.8 pounds per vehicle to 153.8 pounds per vehicle. Most of the declines come from content losses from powertrain and drivetrain castings

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EXECUTIVE SUMMARY: MASS REDUCTION SCENARIOS AFTER 2020

Mass Reduction Scenarios: 2021 - 2028

- Based on EPA and NHTSA technology implementation pathways, mass reductions from zero percent for some passenger cars and small SUVs to 20% for large trucks and SUVs is technically feasible and required to achieve and overall industry average mass reduction of 7% (270 pounds) from 2015 to 2025 and beyond
- Vehicle launch cadence is a critical factor influencing the pace of new technology adoption. The next launch of a high volume vehicle with significant aluminum BIW content is 2024. A plethora of vehicles with significant aluminum body content are expected to launch within the 2024 – 2028 timeframe further indicating the need to examine attainment of mass savings goal beyond 2025
- A total mass savings of 270 pounds is the goal for 2025; however, the weight savings achieved from 2015 to 2020 will only be 100 pounds leaving 170 pounds to be removed from 2021 to 2025. Empirical evidence from Ducker's research with OEMs and their suppliers suggests achieving the 7% curb mass reductions is likely to be delayed to 2028 due in part to practical new model launch timing constraints
- Under all the scenarios, aluminum contributed to more than 50% of the total mass reduction ranging from 270 pounds (7% MR) to as little as 170 pounds (4.5% MR) by 2028
- Closures are the most consistent high growth application for aluminum under all scenarios. Crash management, steering and chassis aluminum parts don't vary a great deal under the three mass reduction scenarios. Like closures, these components are very compatible with vehicle utilizing steel within its BIW
- Net increase in aluminum content in all scenarios includes a decline of 12 pounds per vehicle in aluminum powertrain content after 2020

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EXECUTIVE SUMMARY: MASS REDUCTION SCENARIOS AFTER 2020

7% Mass Reduction Scenarios

- Ducker believes the 7% average mass reduction (270 pounds) by 2028, with nearly five million vehicle with 850 pounds of total aluminum content or greater is the most likely scenario.
- The 7% Mass Reduction Scenario uses the TAR as a guideline and requires a multi-material substitution strategy with significant quantities of aluminum, AHSS/UHSS, magnesium and some CFRP applied after 2020. Achieving the 7% goal requires nearly 5 million vehicles with a weight reduction of over 10% and a high content of aluminum BIW parts and all the pickup trucks and large SUVs with 15% to 20% mass savings
- Material content for mass reduction of 7% by 2025, or 7% mass reduction by 2028 are the same. The major difference is the technology implementation rates and the available vehicles for mass reduction based on vehicle model cadence
- In the 7% Mass Reduction scenarios, multi material / multi product BIW structures were assumed to be much more prevalent than all-aluminum body structures, and less prevalent that all-steel body structures in 2025 and 2028
- There were several parts identified as High Growth Aluminum parts and include: closures, BIW structures, crash management, sub-frame,/cradle, cross members and steering parts
- The 7% Mass Reduction (2025 or 2028) scenarios will result in:
  - Total aluminum content growing to 565 pounds per vehicle (16% of curb mass)
  - Aluminum share of curb mass growing from 10% in 2015 to 16% by 2028
  - Nearly 25% of 2028 vehicles having partial aluminum BIW and in some cases complete BIW. 2.1 million of those vehicle will be pickup trucks and 400,000 will have PHEV/ZEV powertrains

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EXECUTIVE SUMMARY: MASS REDUCTION SCENARIOS AFTER 2020

7% Mass Reduction Scenarios Continued

- Aluminum closures will grow to over 100 pounds per vehicle and 85 pounds per vehicle under 4.5% MR scenario)
- Thirty five critical vehicle programs will account for 25% of total vehicle production. These vehicles will provide over 50% of all weight savings from material substitution
- Aluminum stamped BIW parts will grow to 61 pounds per vehicle, but will drop to only 34 pounds per vehicle under the 4.5% MR scenario. Stamped aluminum BIW parts only grow under the need for significant mass reduction. Body extrusions display a similar pattern to body stampings
- Vacuum Die Castings are the most secure aluminum parts for BIW structures due to the parts consolidation available with VDC
- Steel, magnesium, CFRP and polycarbonate additions are critical, however, aluminum BIW and closure parts are the key to success for reaching the 7% MR goal sometime in the next decade

4.5% Mass Reduction Scenario

- A 4.5% Mass Reduction scenario reflects a more "market driven" scenario with less aluminum and polymer composites in the BIW. This scenario adds less than one million vehicles with a 10% weight savings after 2020
- The 4.5% MR scenario by 2028 results in total aluminum content of 494 pounds per vehicle, or only 28 pounds per vehicle over 2020
- Aluminum closures will grow to over 85 pounds per vehicle from 62 pounds per vehicle in 2020

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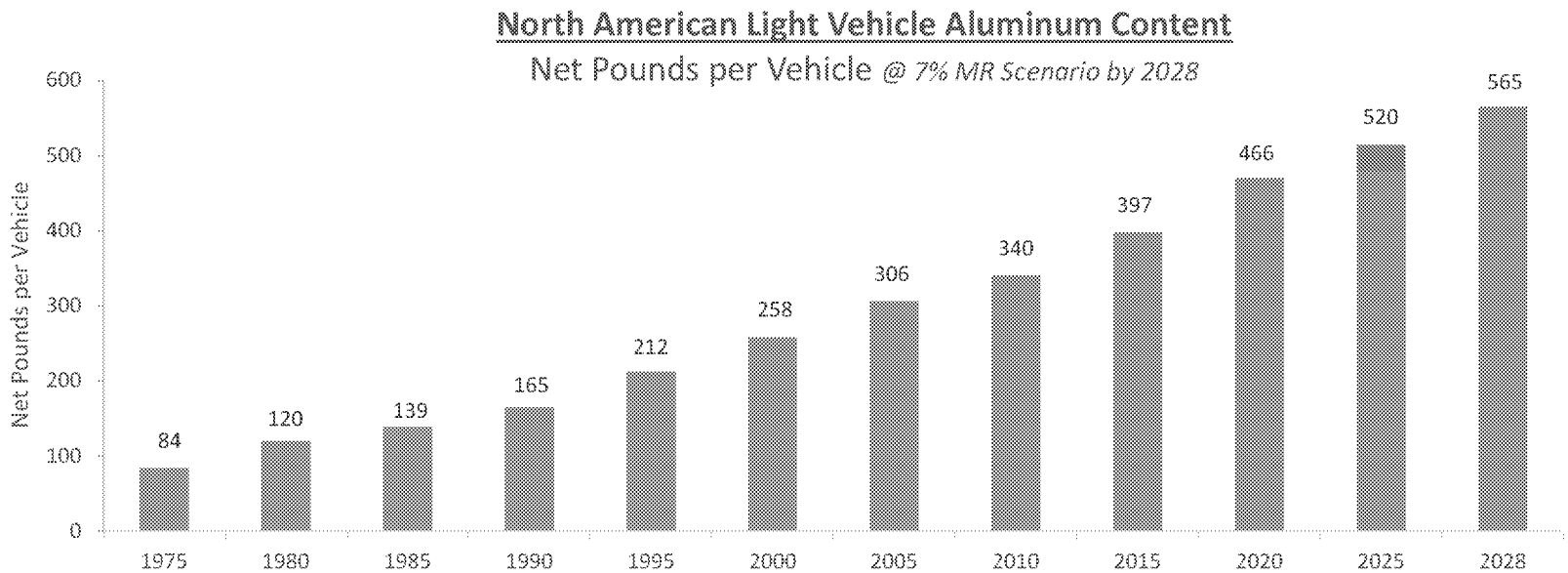
EXECUTIVE SUMMARY: ALUMINUM CONTENT 1975 TO 2028

Under all mass reduction scenarios, aluminum content in North American light vehicles will continue to show uninterrupted growth well into the next decade. The 7% mass reduction scenario by 2028 achieves an average addition of 15 pounds of aluminum content annually from 2015 onward.

55 Years of Uninterrupted Growth



Source: Ducker Analysis 1Q2017

STUDY FINDINGS – ALUMINUM 2020

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STUDY RESULTS: ALUMINUM 2020

The growth for aluminum over the next five years has been analyzed and determined by a vehicle by vehicle, bottoms-up, additions and changes, based on primary research.

- The North American auto industry will achieve mass reduction of 100 pounds, (a reduction of 2.6%) compared to total vehicle weight of 3835 pounds in 2015. Aluminum will contribute 57 direct pounds
- Total aluminum content for 2020 will reach 466 pounds. This is an increase of 69 pounds from 2015
- Other aluminum parts will decline in weight by 9 pounds due to losses in engine size including the number of cylinders needed to maintain the current horsepower to weight ratio.
- The principal growth product for aluminum will be sheet for aluminum closures. For example, aluminum hoods will grow from 50% penetration today to over 71% penetration by 2020
- Total aluminum BIW & Closure sheet content for 2020 will be 1.63 billion pounds. The gross requirement could be as much as 2.42 billion pounds (1.1 million metric tons). Aluminum vacuum die castings will grow from less than 3 pounds per vehicle in 2015 to 14 pounds per vehicle by 2020. These thin-walled castings will be used on several new platforms as a replacement of steel stampings and in competition with aluminum stampings and some applications for extrusions
- After 2020, Ducker looked at different scenarios for aluminum auto growth in the next decade

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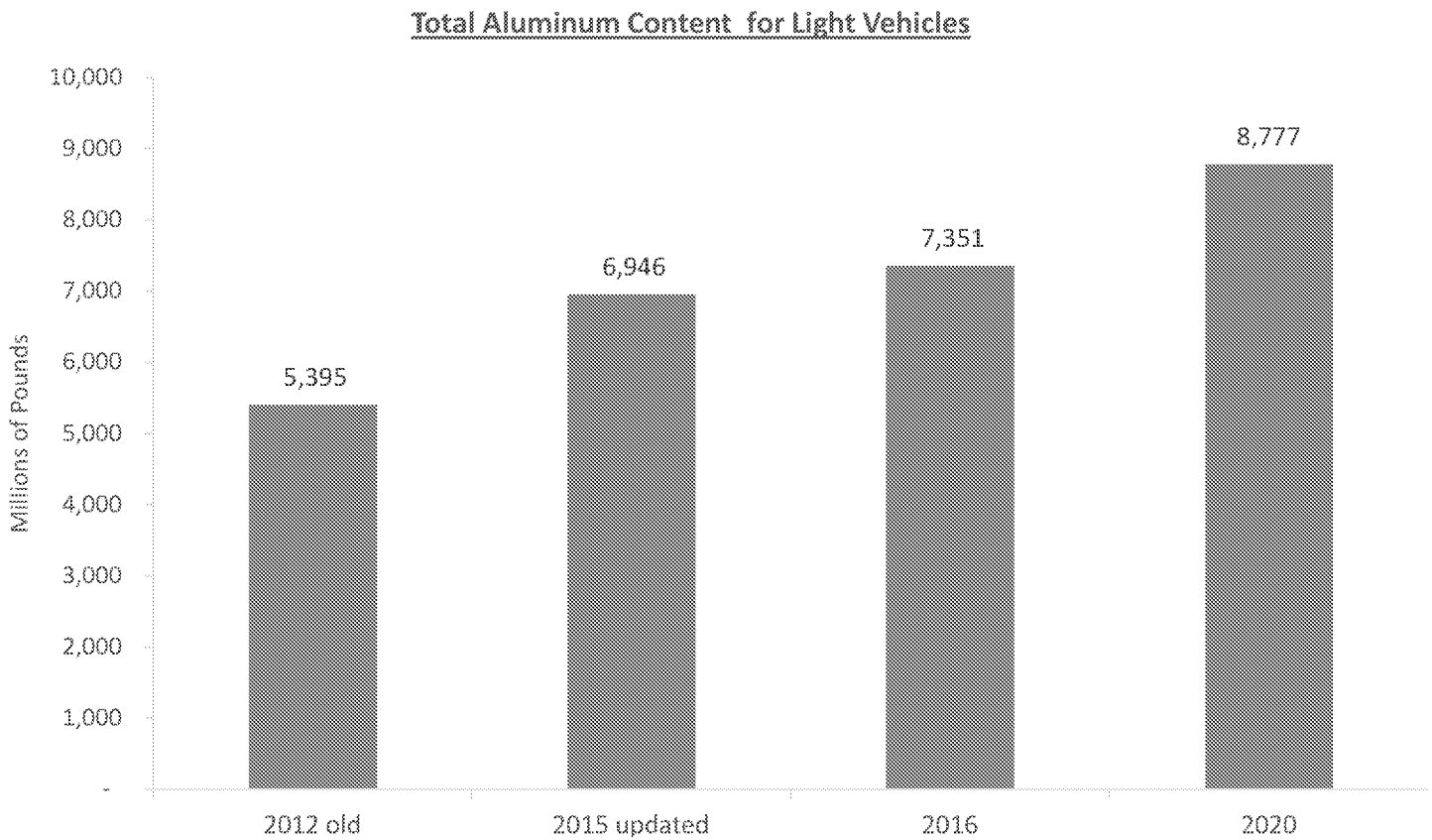
STUDY RESULTS: ALUMINUM 2020

Total North American light vehicle aluminum consumption will increase 29% in 2015 over 2012; this will increase another 6% in 2016 over 2015. Consumption in 2020 will surpass any records set before 2012 by nearly 3.5 billion pounds. This increase is an equal combination of more vehicles and aluminum content per vehicle.



	2012 old	2015 updated	2016	2020
Vehicle Production Units	15,434,338	17,495,388	17,885,647	18,835,325

Source: Ducker Analysis 1Q2017

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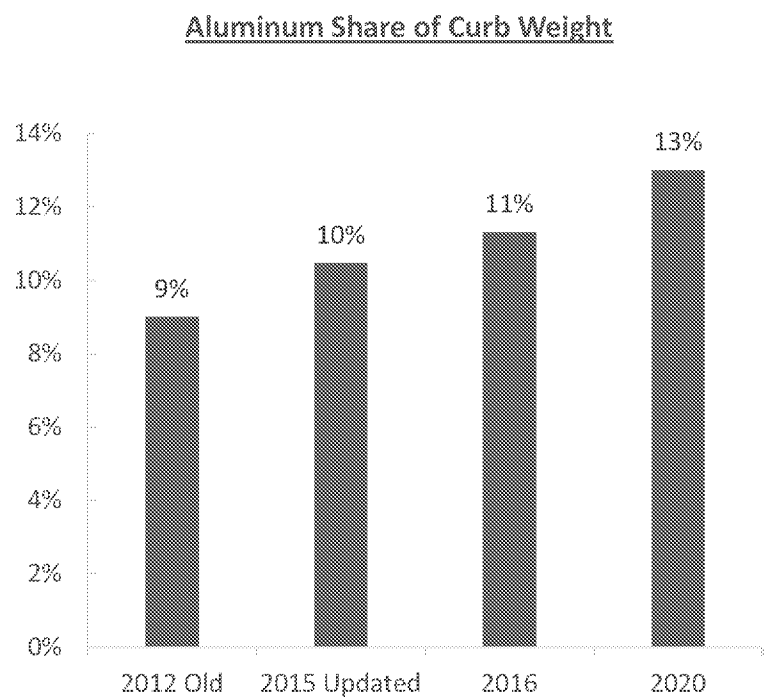
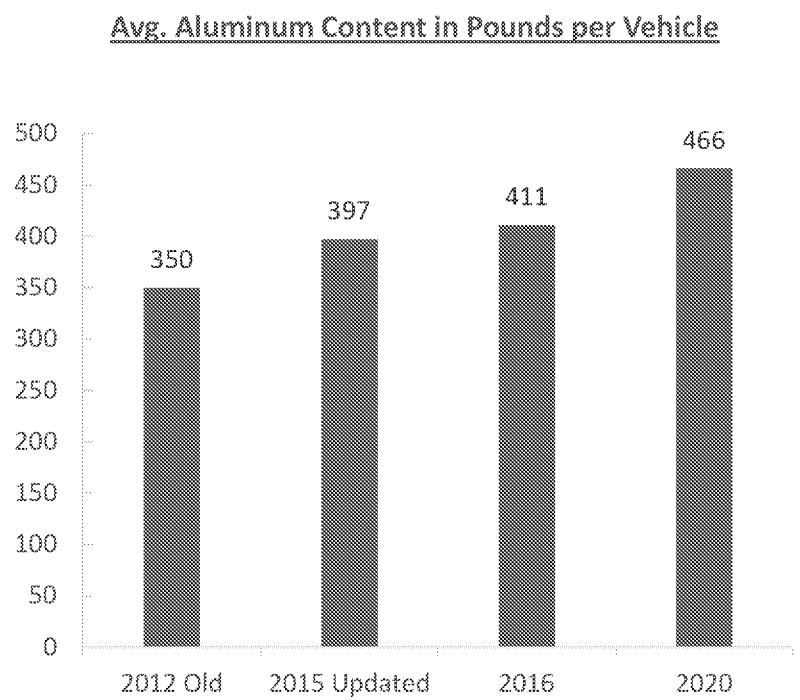
STUDY RESULTS: ALUMINUM 2020

Aluminum's share of the curb weight in 2015 is 10%, compared to 9% in 2012. Aluminum's share of the curb weight in 2016 is 11%.



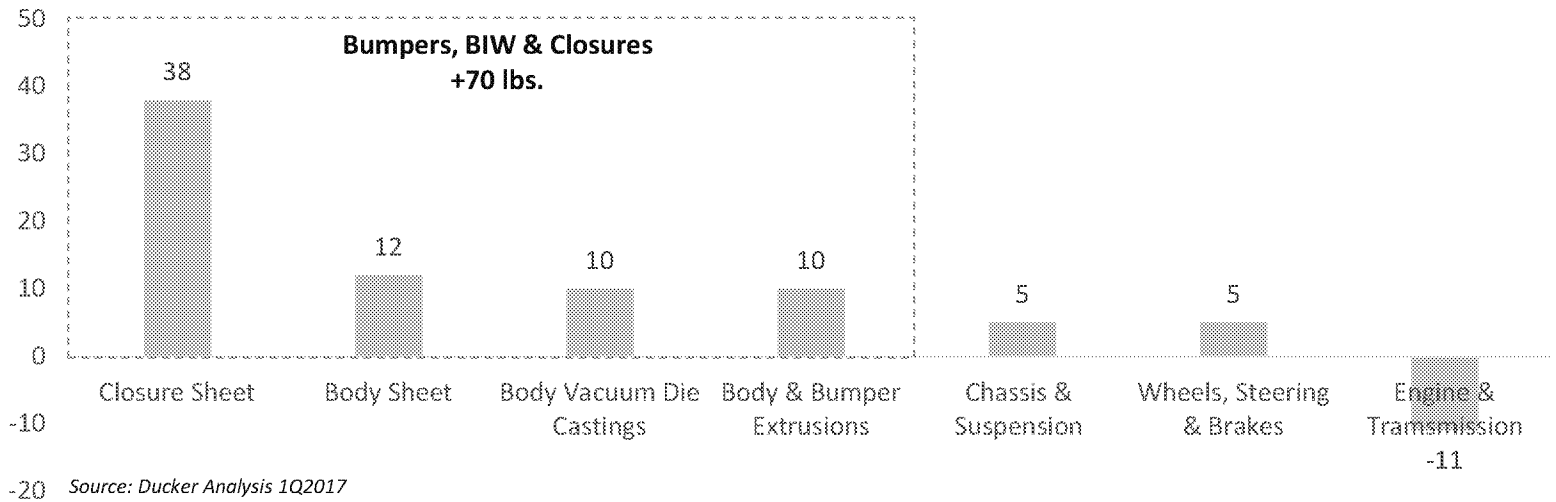
Source: Ducker Analysis 1Q2017



STUDY RESULTS: ALUMINUM 2020

Large content increases for closures, body-in-white parts and crash management parts are driving nearly 69 pounds of net aluminum content growth from 2015 to 2020. However, even when combined with over 150 pounds of growth for AHSS/UHSS steels, the mass savings will only be 100 pounds or 2.6% from 2015 to 2020.

Component or System Changes for Aluminum Content in 2015 versus 2020

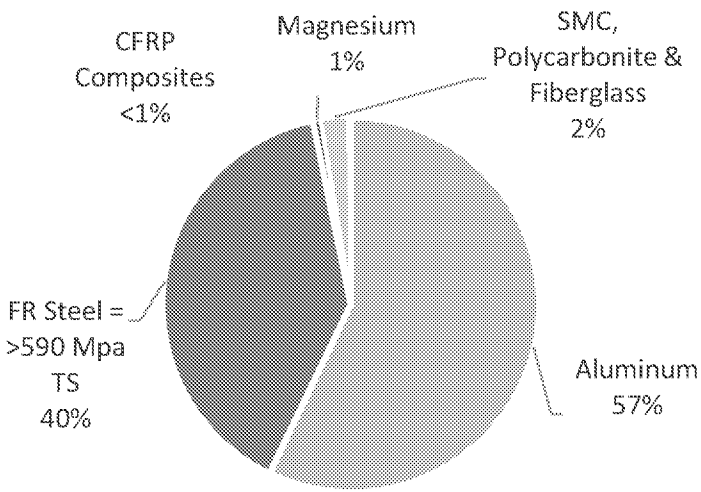


Source: Ducker Analysis 1Q2017

STUDY RESULTS: ALUMINUM 2020

Most of the major materiel decisions have been made for vehicles to launch in the next four years. Those decisions reveal that advanced grades of high strength steels and aluminum will be added to achieve a mass savings from material substitution of approximately 100 pounds.

2015-2020 Sources of Mass Savings from Material Substitution



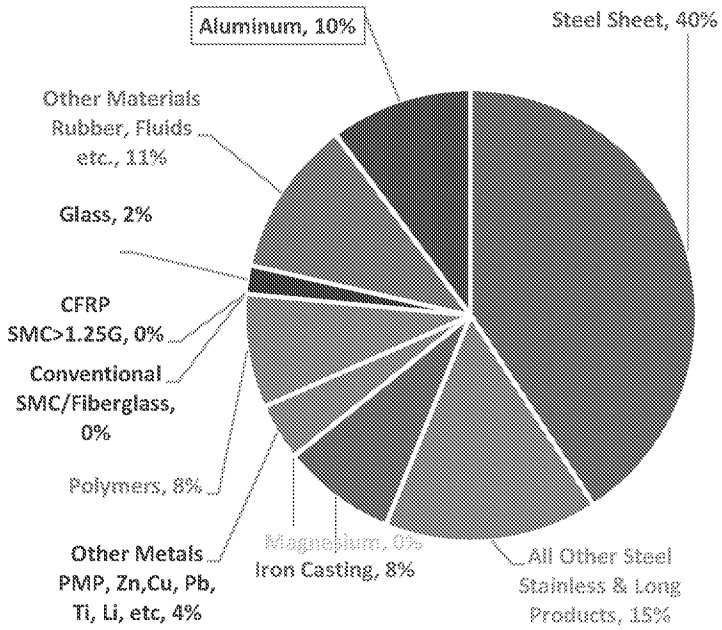
100 Pounds Saved

Source: Ducker Analysis 1Q2017

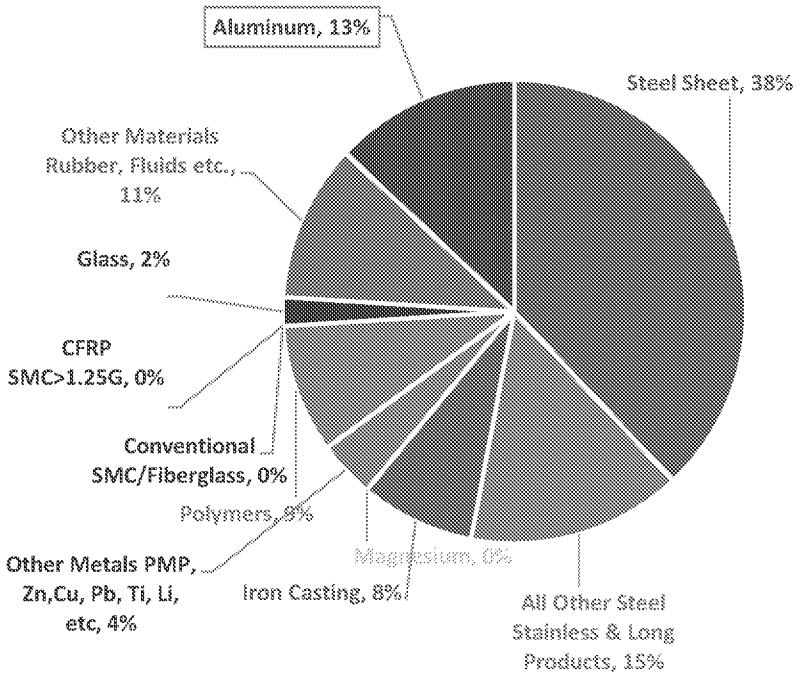
STUDY RESULTS: ALUMINUM 2020

Light Vehicle Material Mix shows aluminum will grow to 13% of total weight by 2020, and the mass savings will be 100 pounds with over 50% attributable to aluminum substitution for steel.

2015 CURB WEIGHT 3835 LBS



2020 CURB WEIGHT 3735 LBS

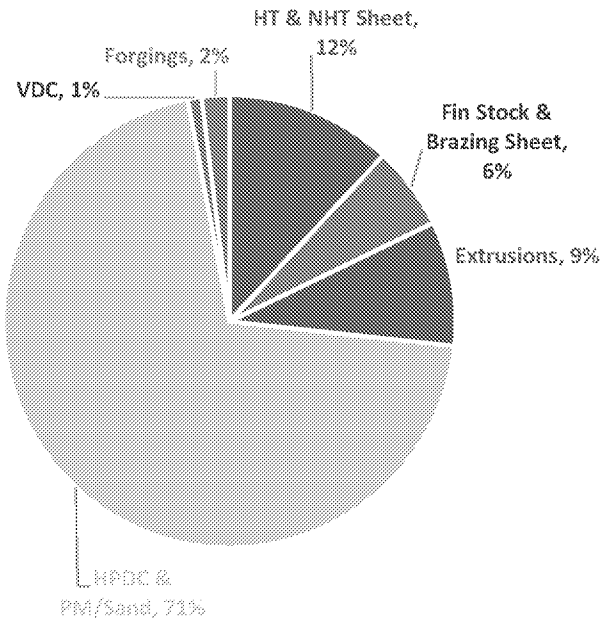


Source: Ducker Analysis 1Q2017

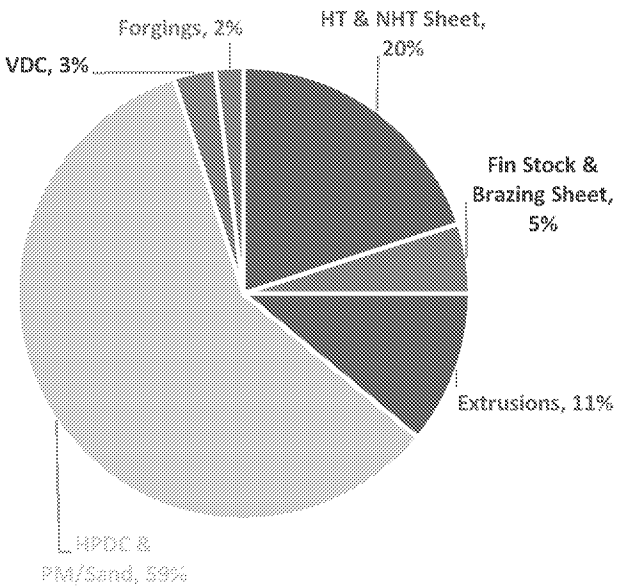
STUDY RESULTS: ALUMINUM 2020

Mill products and vacuum die castings will increase their share of all aluminum products from 29% in 2015 to 41% in 2020, as conventional HPDC, permanent mold and sand castings lose share.

2015 | 397 LBS



2020 | 466 LBS



Source: Ducker Analysis 1Q2017

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COMPONENT ANALYSIS

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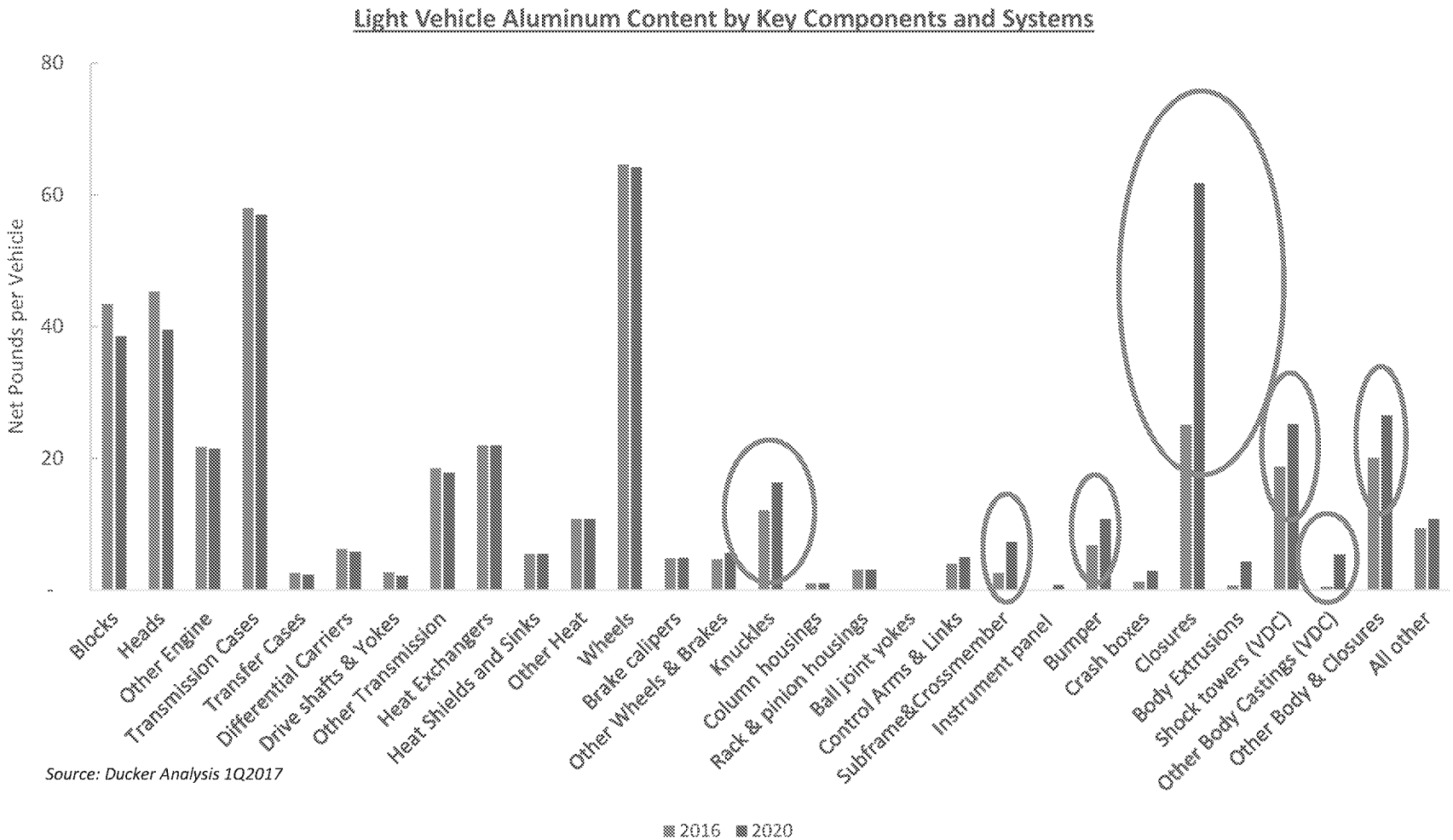
2016 VS. 2020 COMPARISONS

We can summarize the nearly 100 individual components being tracked into approximately 30 key components or systems. The key components for growth are indicated.



Source: Ducker Analysis 1Q2017

VEHICLE SEGMENT ANALYSIS

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VEHICLE SEGMENT ANALYSIS: ALUMINUM 2020

In 2020 the A/B Segment and VANs have decline in aluminum content overall due to downsize in aluminum castings primarily from the engine and other powertrain applications.

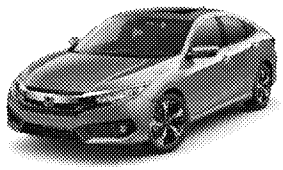
2020 Vehicle Segment Average Aluminum Pounds and Share of 2020 Production:

A/B Segment
Fiat 500
Ford Fiesta

240.6 lb.'s

3% of Production

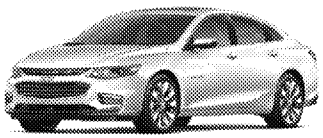
C Segment
Ford Focus
Honda Civic



278.4 lb.'s

15% of Production

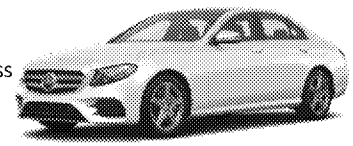
D Segment
Chevy Malibu
Dodge Charger
MUSTANG



447.6 lb.'s

17% of Production

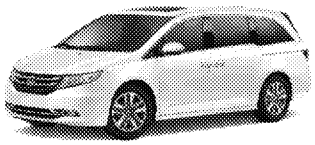
E Segment
Daimler E Class
Cadillac CT6



490.0 lb.'s

2% of Production

MPV Segment
Honda Odyssey
Chrysler Pacifica



399.7 lb.'s

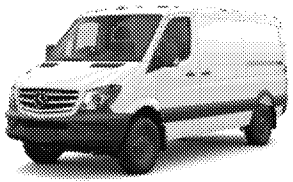
3% of Production

SUV Segment
Chevy Suburban
Jeep Grand Cherokee

475.1 lb.'s

41% of Production

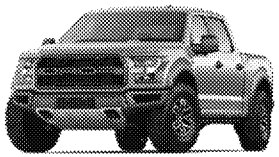
VAN Segment
Dodge Sprinter
Ford Transit



338.9 lb.'s

2% of Production

PUP Segment
Ford F150
Toyota Tundra



676.3 lb.'s

17% of Production

Source: Ducker Analysis

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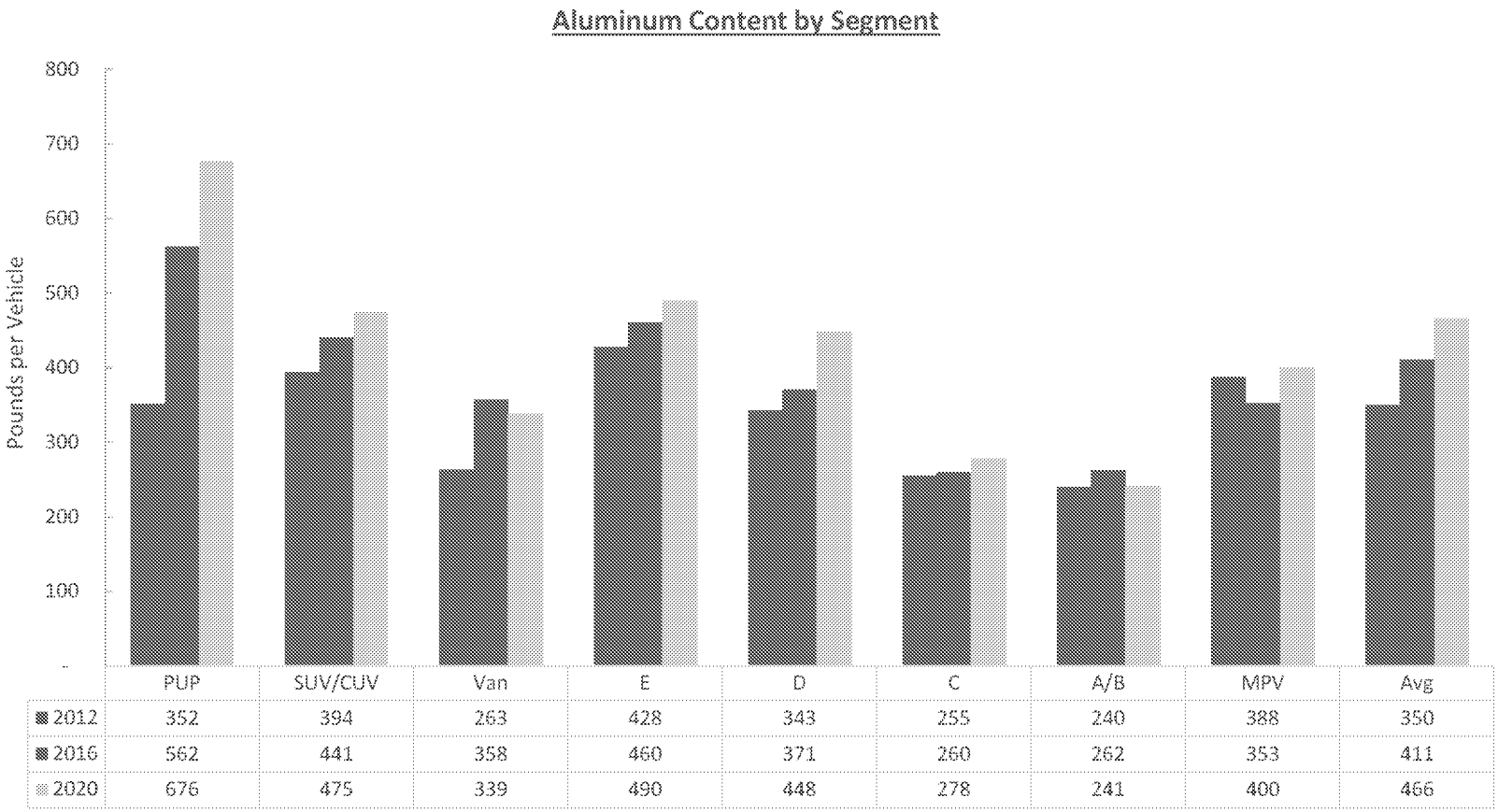
VEHICLE SEGMENT ANALYSIS: ALUMINUM 2020

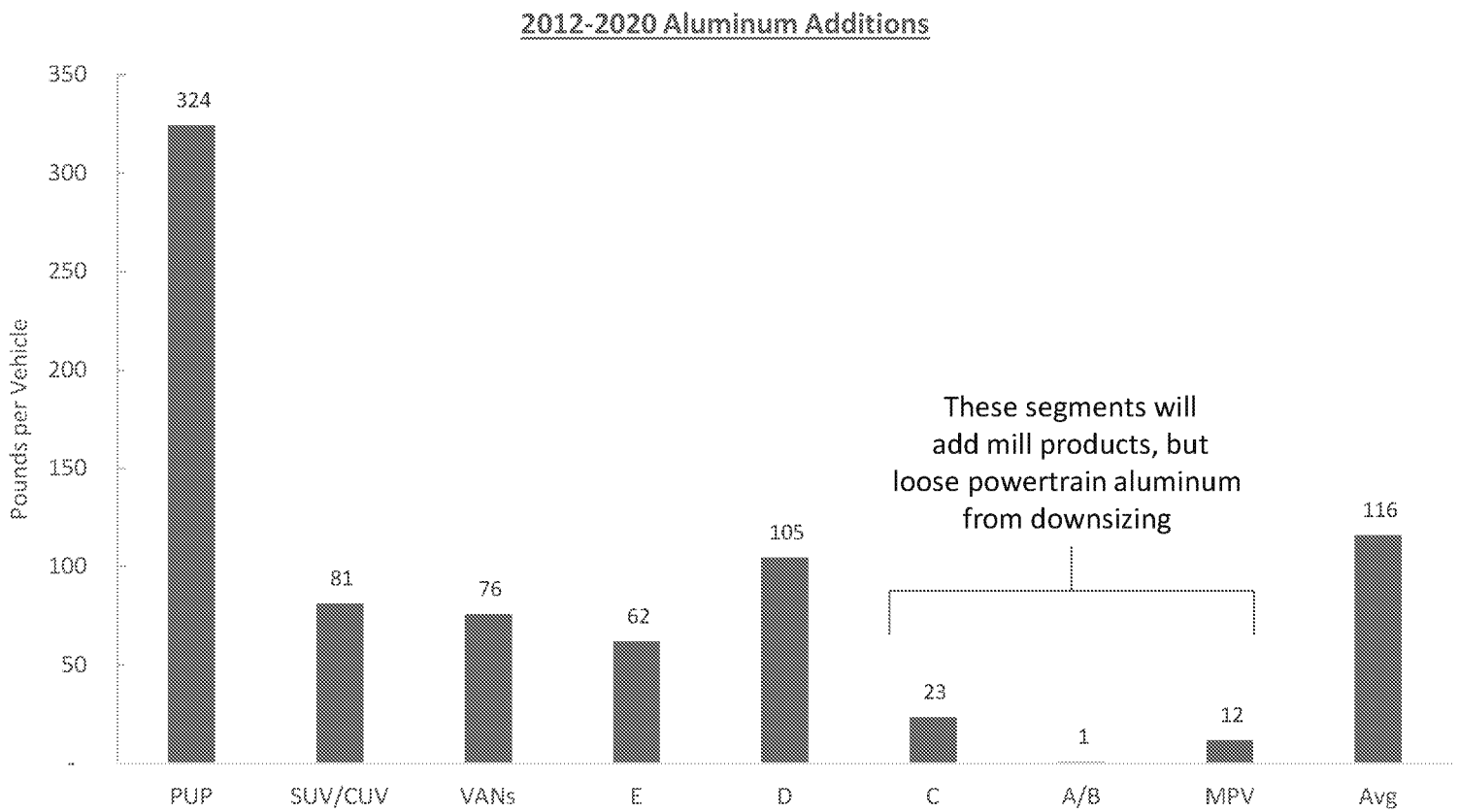
The average vehicle will add nearly 55 pounds of aluminum content between 2016 and 2020; PUP Segment will add the most aluminum with 114 pounds expected.



Source: Ducker Analysis

VEHICLE SEGMENT ANALYSIS: ALUMINUM 2020

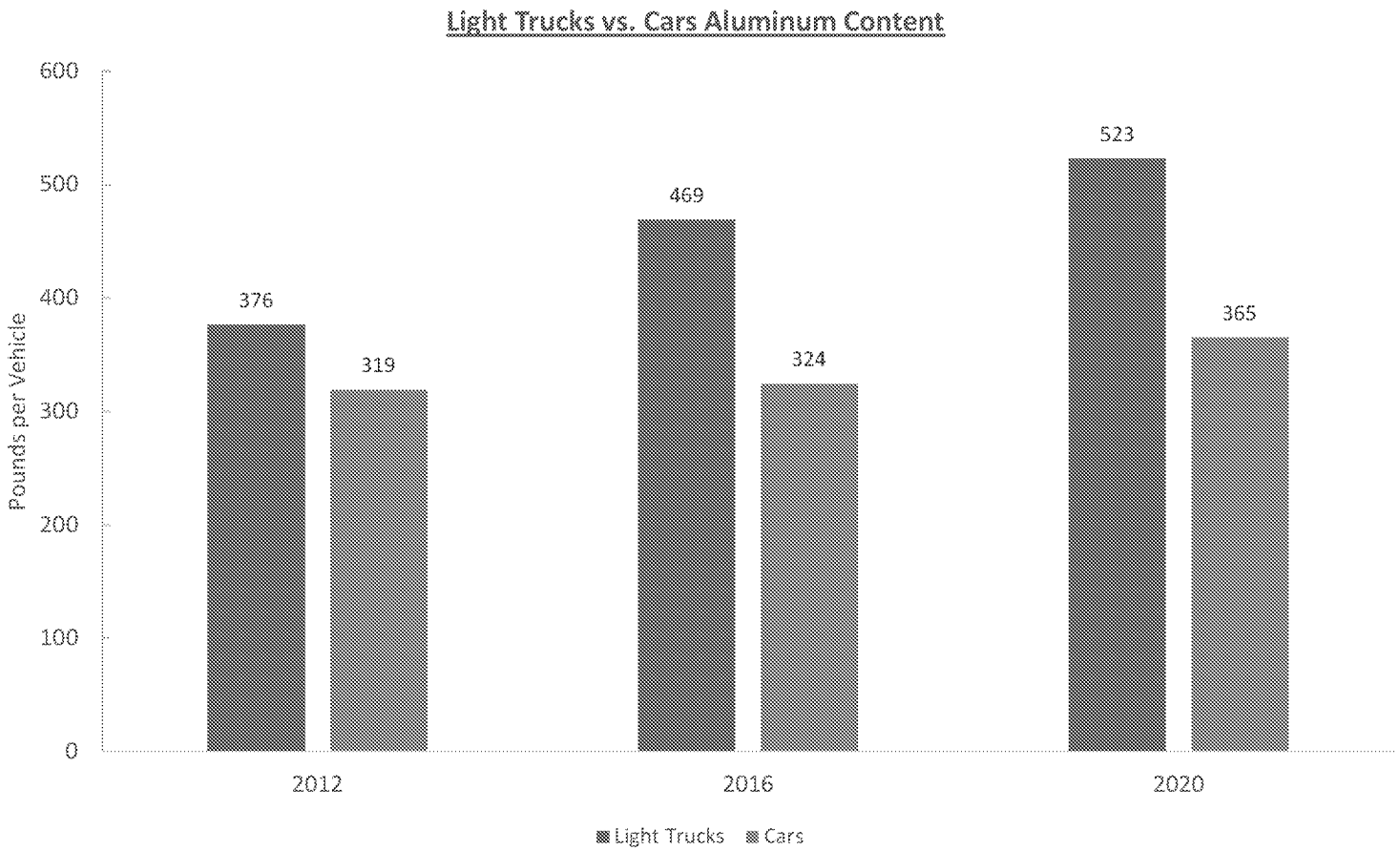
Between 2012 and 2020, North American light vehicles add as much as 300 pounds for pickup trucks to less than 50 pounds for small cars and full size vans.



Source: Ducker Analysis

VEHICLE SEGMENT ANALYSIS: ALUMINUM 2020

Light trucks (pick ups, SUVs, vans and multipurpose vehicles) will add 150 pounds of new aluminum content from 2012 to 2020. These vehicles need to rely on weight savings for fuel economy improvement than cars. Passenger cars will only add approximately 50 pounds of new aluminum over the same period.



Source: Ducker Analysis

MASS REDUCTION SCENARIOS AFTER 2020

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MASS REDUCTION SCENARIOS

Duckers study and model is based on OEM and supplier tendecies and outlook and is further unconstrained by material bias.

Modeling Constraints:

- Overall weight savings from aluminum was constrained to 50% of the overall weight savings. Some vehicles used aluminum for over 75% of their weight savings, but overall 50% was still maintained for the fleet
- Significant weight savings was concentrated on full frame vehicles, large unibody SUVs, minivans, luxury sedans and PHEV/ZEVs
- Significant weight savings requires new vehicle designs in most cases. The model replacement cadence from 2023 to 2026 is conducive to some dramatic changes in materials and powertrains
- Ducker recognizes that many vehicles will save less than 100 pounds over the next fifteen years due to safety concerns, cost and competitive conditions
- OEM tendencies for spot welded body structures, aluminum structural castings, UHSS/AHSS (advanced steel) for occupant compartments and steel/polymer for pickup cargo boxes were taken into account. Multi material (MMV) body structures were assumed to be much more prevalent than 'all aluminum' body structures, but less prevalent than 'all steel' body structures
- Finally, the emphasis on proven technologies for mass production can not be overstated. Most of the alloy technology for 2025 has already been invented. It may not be well known, but the patents have been filed. It is unlikely that there is a material magic bullet for weight savings awaiting discovery

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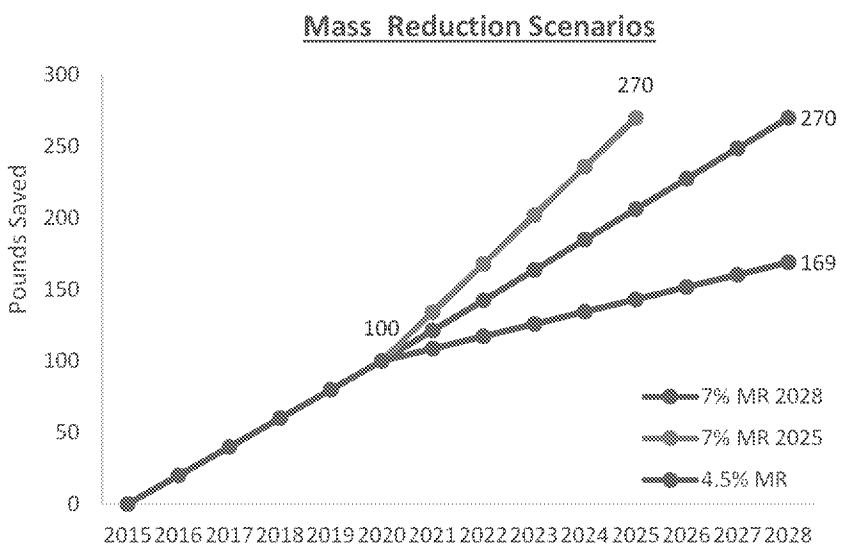
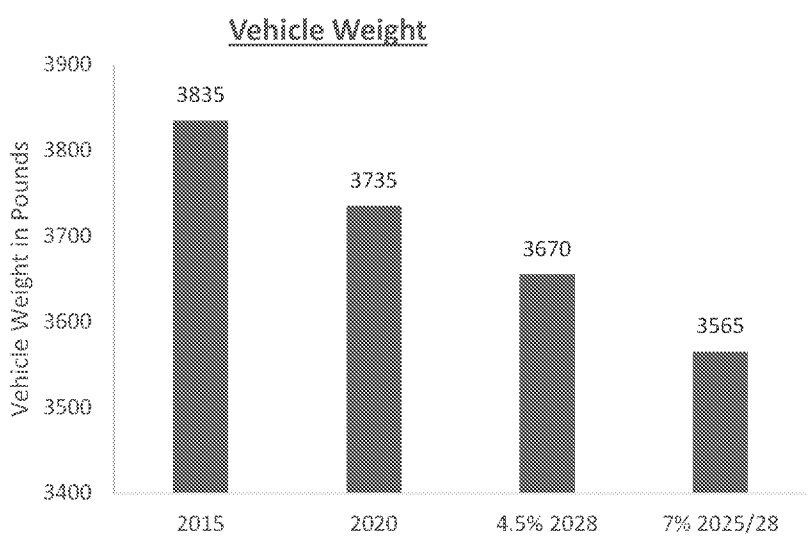
MASS REDUCTION SCENARIOS

The 7% Mass Reduction Scenario is consistent with the TAR, and maintains the current trend to save approximately 20 pounds per vehicle per year over the next ten years.

- The 7% Mass Reduction Scenario uses the TAR as a guideline, ultimately requires a multi-material substitution strategy with significant quantities of aluminum, AHSS/UHSS, magnesium and CFRP applied after 2020 to get to a 7% mass reduction by 2025 or by 2028.
  - To achieve a 7% MR by 2028 requires nearly 5 million vehicles with a weight reduction of over 10% and a high content of aluminum BIW parts with all the pickup trucks and large SUVs showing a 15% to 20% weight savings
  - Achieving a 7% MR by 2025 will require an accelerated adoption (than the 2028 scenario) by the OEMs in converting to greater levels of aluminum, AHSS, magnesium and CFRP. Based on calculations, discussions and analysis, Ducker believes the 7% MR by 2028 is a more achievable
- The 4.5% Mass Reduction by 2028 Scenario reflects a more market driven and performance requirement scenario with less aluminum and polymer composites in the BIW
- Ducker believes the 7% weight savings by 2028 is the most likely scenario for the next decade



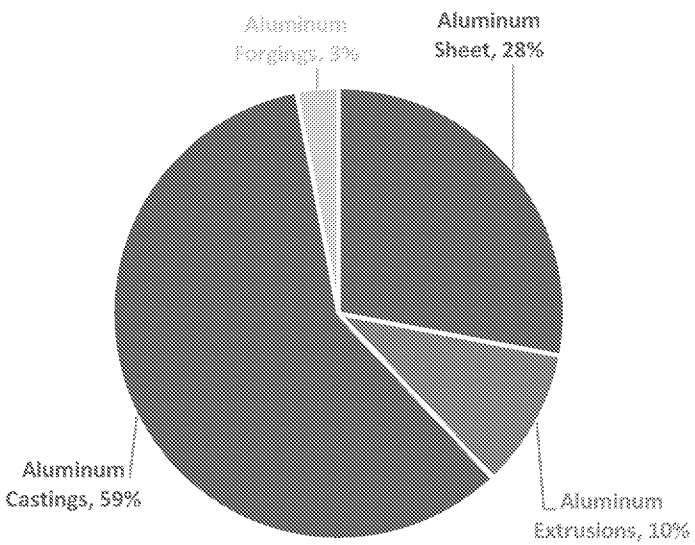


MASS REDUCTION SCENARIOS

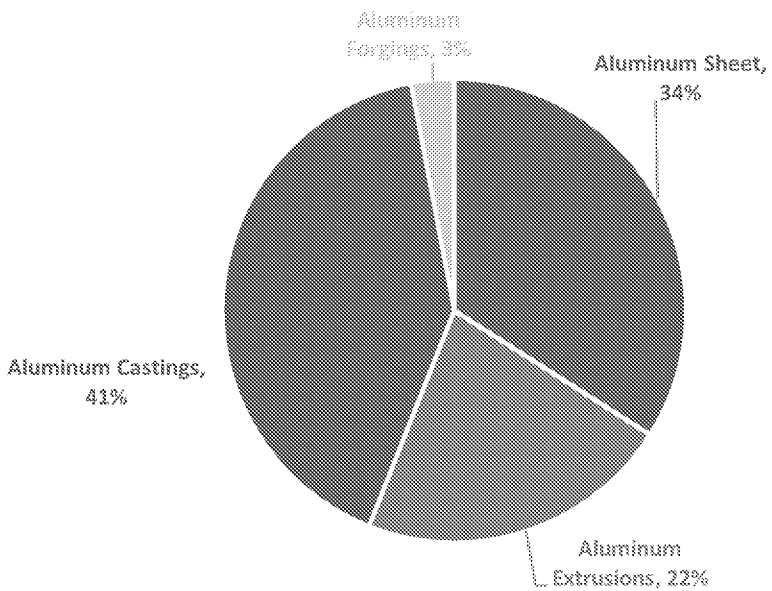
Depending on the level of mass reduction, aluminum content will range from 494 pounds per vehicle to 565 pounds per vehicle, flat rolled sheet will range from 28% to 34%of the total, extrusions will range from 10% to 22% and castings will range from 59% to 41%.

- Aluminum product mix will vary with the percent mass reduction

4.5% | 494 LBS



7% | 565 LBS



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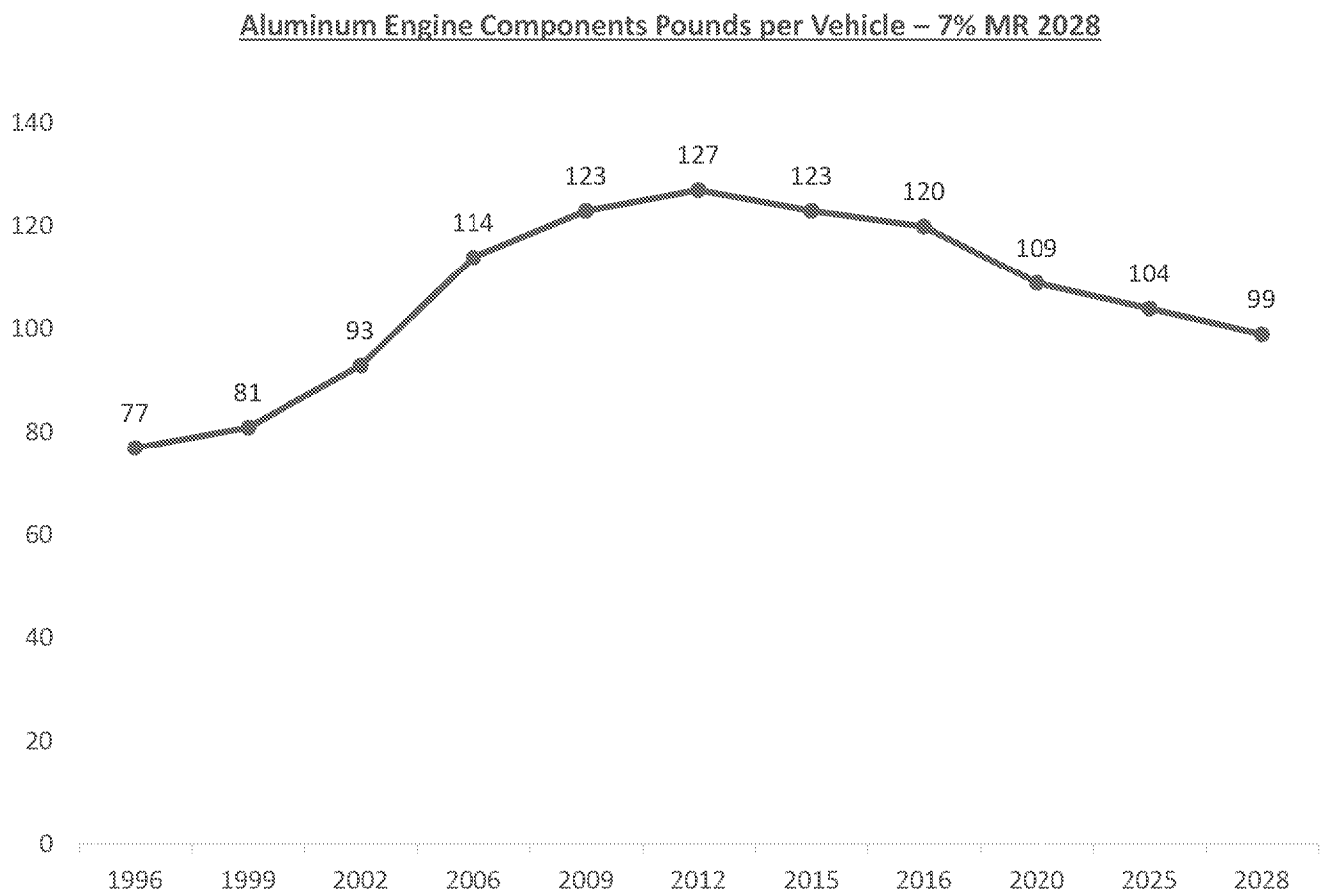
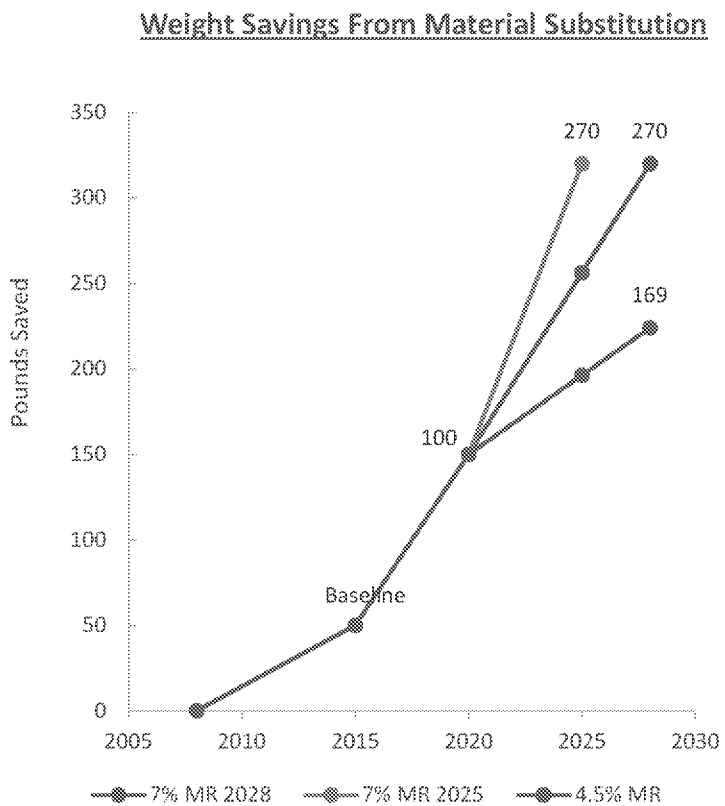
MASS REDUCTION SCENARIOS

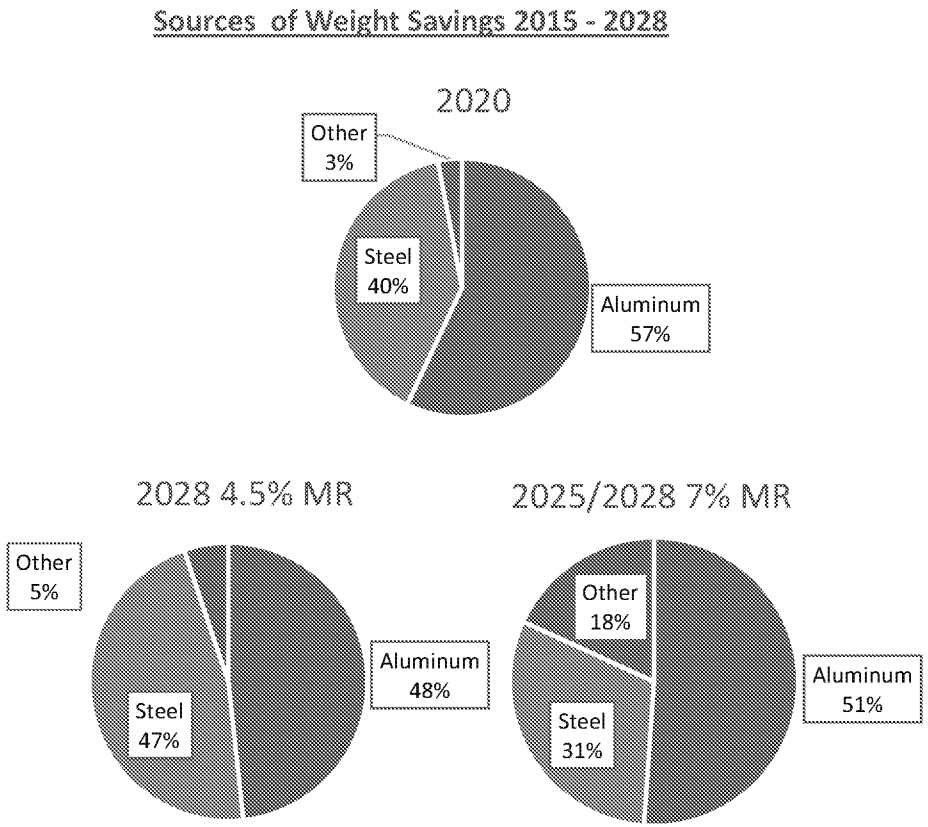
Aluminum content continues steady growth in spite of significant losses of aluminum engine weight due to downsizing. Alternative powertrains will also negatively impact aluminum engine weight, particularly later in the decade.



MASS REDUCTION SCENARIOS

In most cases aluminum will provide over 50% of the savings for the next fifteen years.





7% MASS REDUCTION BY 2025 SCENARIO DETAIL

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7% MASS REDUCTION SCENARIO BY 2025

A total mass savings of 270 pounds is the goal for 2025; however, the weight savings achieved from 2015 to 2020 will only be 100 pounds leaving 170 pounds to be removed from 2020 to 2025.

- The TAR technology implementation path provides a range of mass reduction from 0% for some cars and small SUVs to **20% for large light trucks and SUVs**, to get to an overall industry average weight savings reduction of 7% from 2015 sometime next decade
- The empirical evidence from Duckers research with the OEMs and their suppliers does not support achieving a 270 pound curb weight reduction by 2025
- Launch cadence is critical to the pace of new technology adoption. The next launch of a high volume vehicle with significant aluminum body content is in 2024
- A plethora of vehicles with significant aluminum body content are expected to launch within the 2024-2028 timeframe further indicating the need to examine attainment of mass savings goals beyond 2025
- For these reasons, Ducker believes the 7% mass reduction goal will be achieved in 2028 rather than 2025

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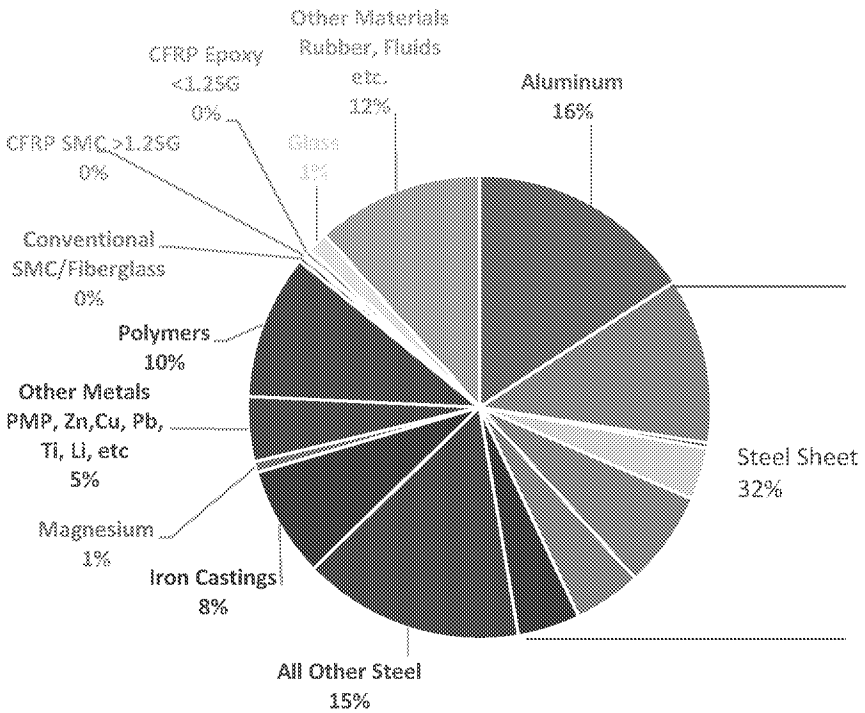
7% MASS REDUCTION SCENARIO BY 2025

This mix reduces 2015 vehicle weight by 270 pounds or 7% by 2025. The empirical evidence from Ducker's research supports achieving the 270 pound curb weight reduction; however, only by 2028.

Highlights:

- 565 total aluminum pounds (16% of total vehicle weight)
- Over 550 pounds per vehicle of flat rolled AHSS/UHSS steel content, but only 46% steel overall
- Twenty one pounds for CFRP Epoxy and SMC composites
- Twenty seven pounds of magnesium
- Polycarbonate windows, and fiberglass/composite leaf springs were applied where appropriate
- Aluminum hood penetration of 90% with door penetration near 60%

2025 CURB WEIGHT 3565 LBS.



7% MASS REDUCTION BY 2028 SCENARIO DETAIL

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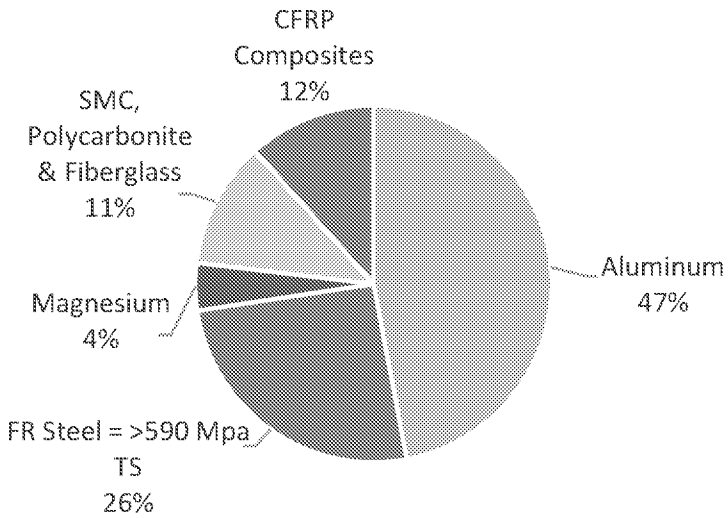
7% MASS REDUCTION SCENARIO BY 2028

Sometime next decade(2025/2028) at least another 170 pounds of gross mass reduction needs to be achieved through material substitution. Generation 3 steels, CFRP composites, polycarbonite windows, fiberglass leaf springs and multi material body structures with significant aluminum content will drive most of the mass savings.

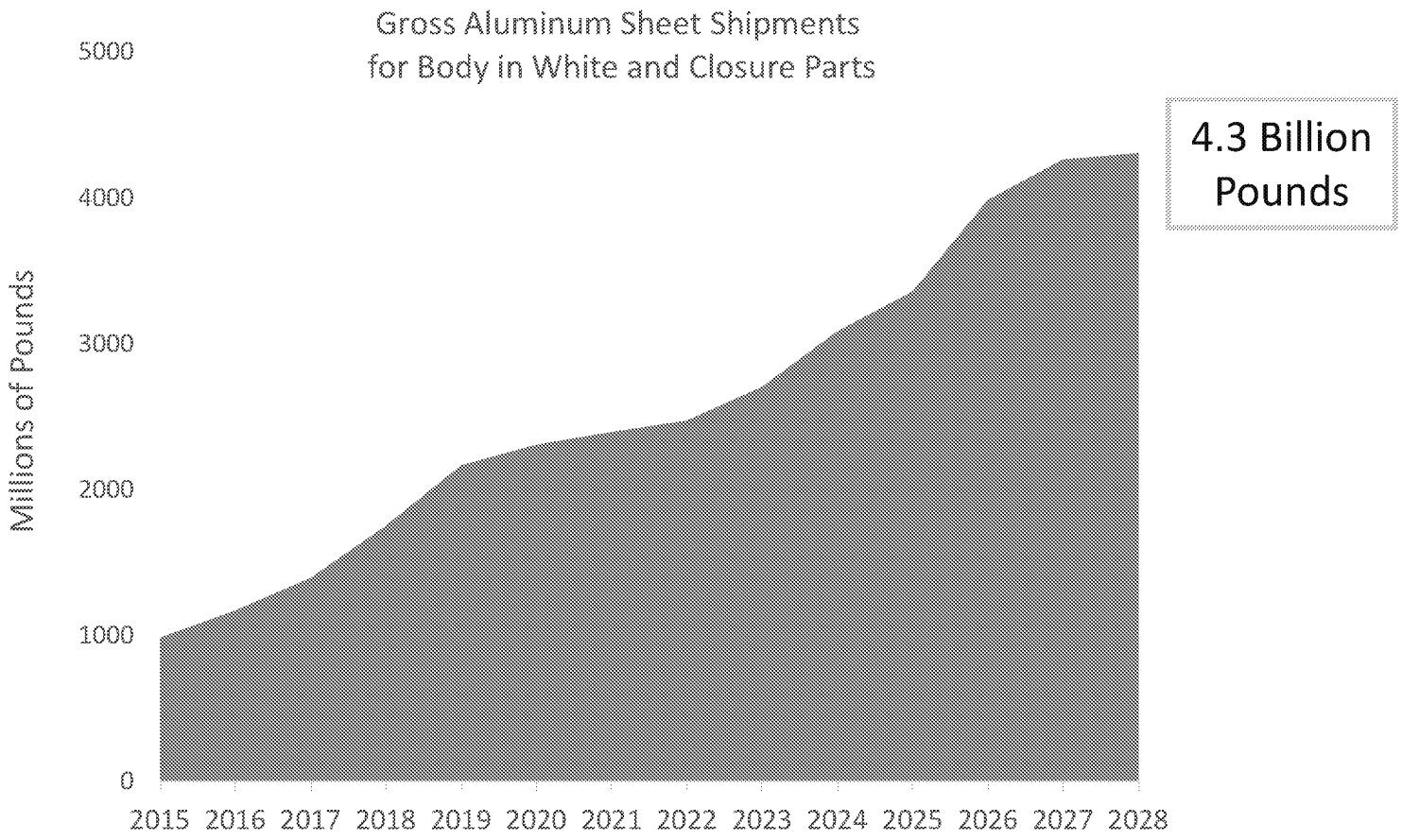
Sources of Mass Savings from Material Substitution



170 Pounds Saved

7% MASS REDUCTION SCENARIO BY 2028

At a **constant production level** of 17.5 million light vehicles in North America, aluminum sheet shipments for body in white and closure parts are expected to grow from less than one billion pounds in 2015 to 4.3 billion pounds by late next decade



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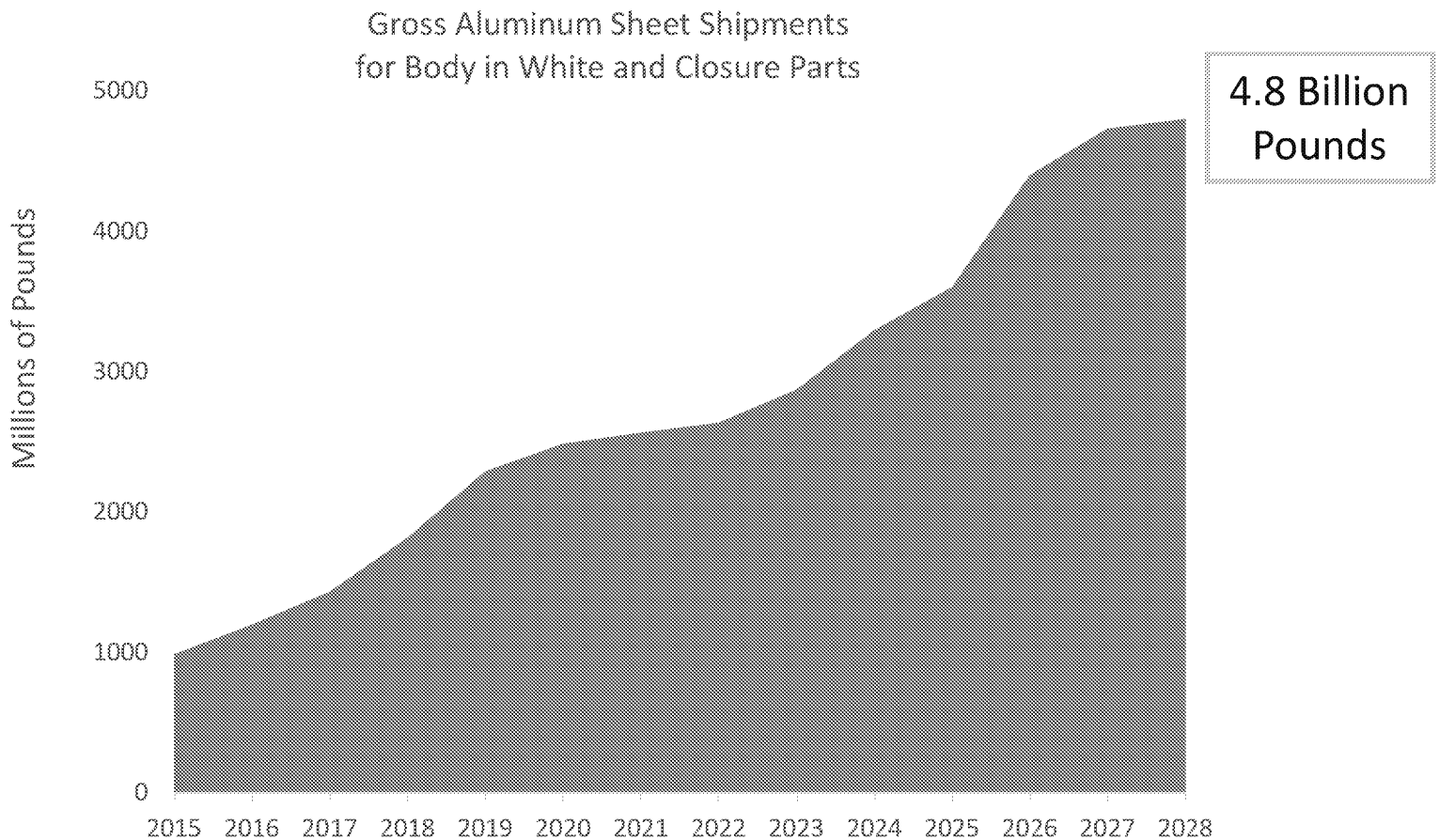
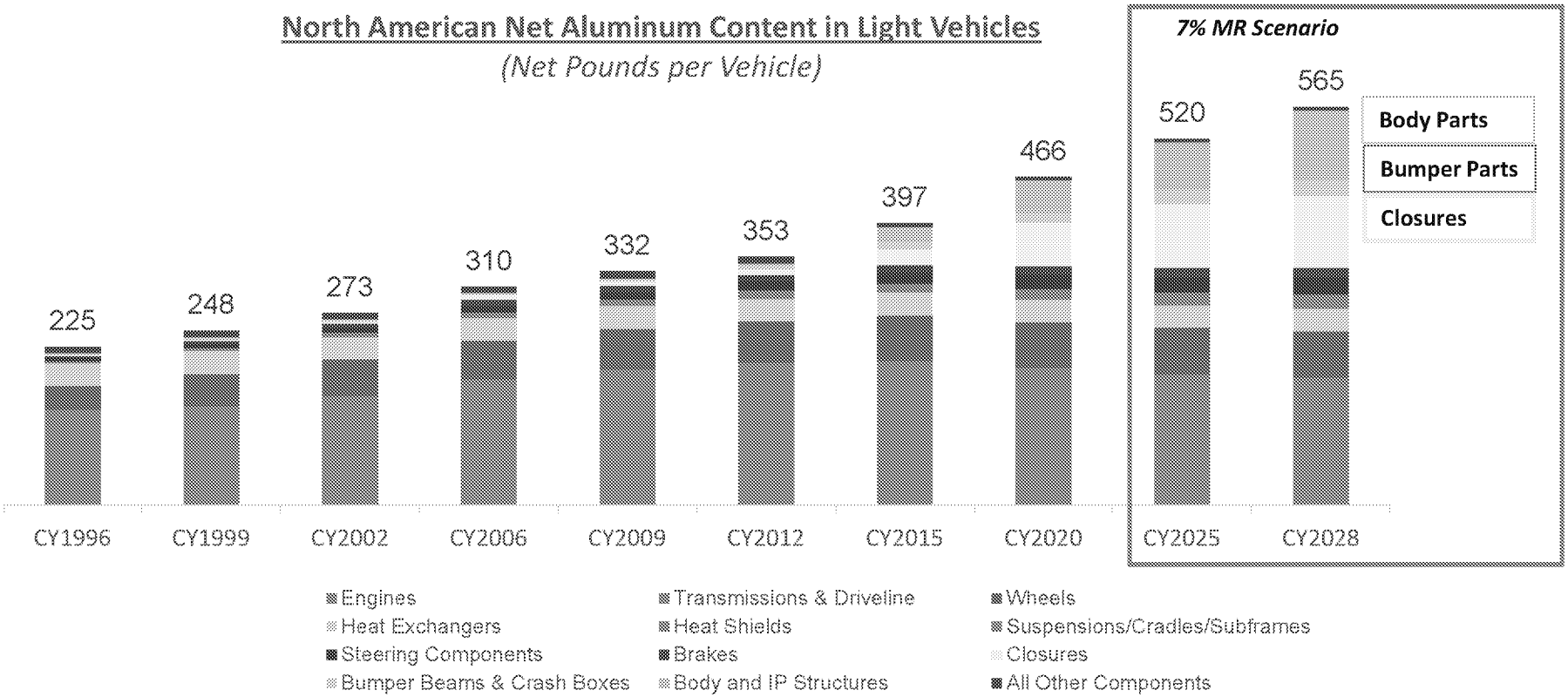
7% MASS REDUCTION SCENARIO BY 2028

At a vehicle **production levels of 19.2M vehicles by 2028 (I.H.S. 4Q2016)**, North American light vehicle aluminum sheet shipments for body in white and closure parts are expected to grow from less than one billion pounds in 2015 to 4.8 billion pounds by late next decade



7% MASS REDUCTION SCENARIO BY 2028

Twenty years of NA Light Vehicle Aluminum Content Research performed by Ducker is shown below. The 7% mass reduction scenario, which is based on meeting the TAR technology path by 2028 rather than 2025 yields 565 pounds of 2028 aluminum content.



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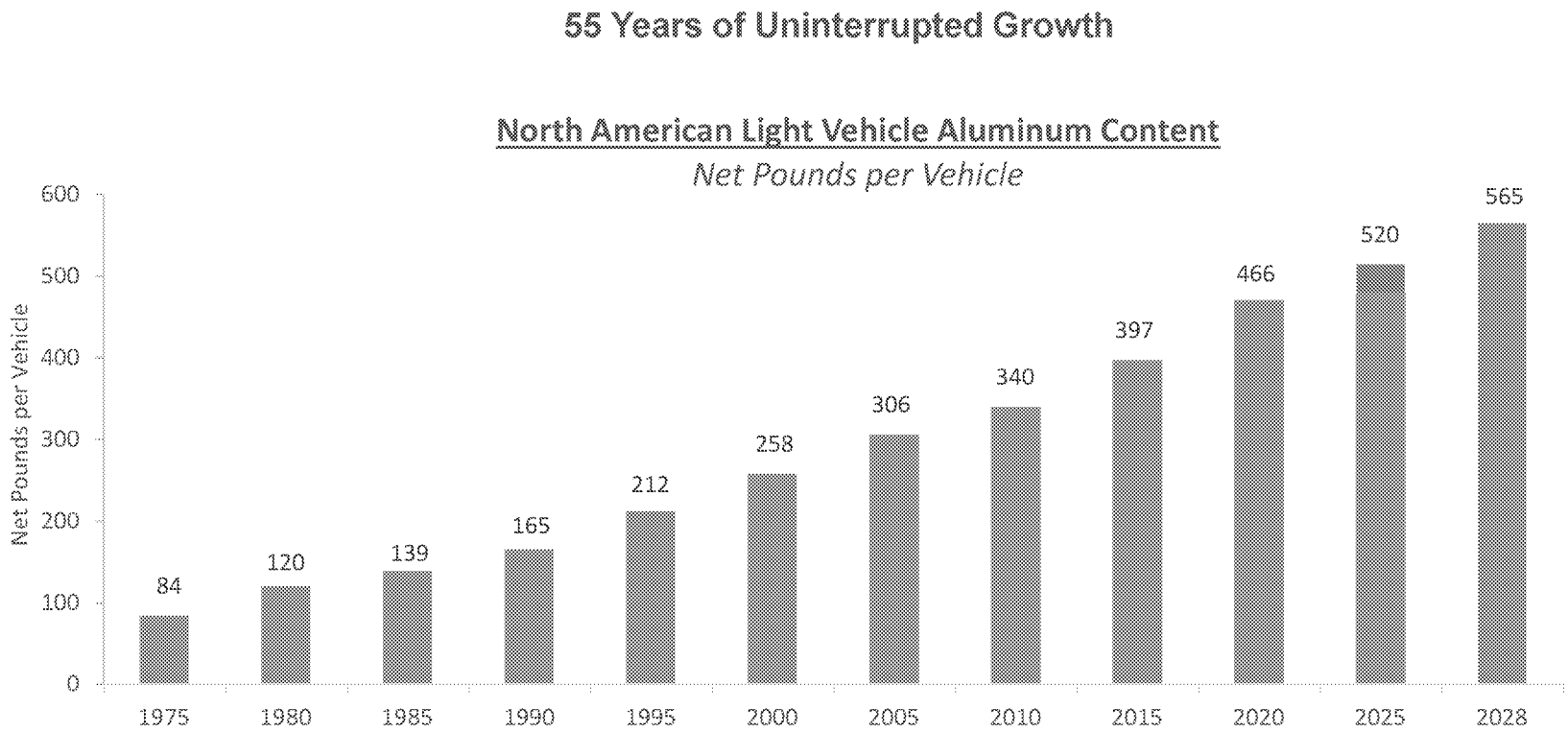
7% MASS REDUCTION SCENARIO BY 2028

Under all the mass reduction scenarios, aluminum content in North American light vehicles will continue to show uninterrupted growth well into the next decade.



4.5% MASS REDUCTION SCENARIO DETAIL

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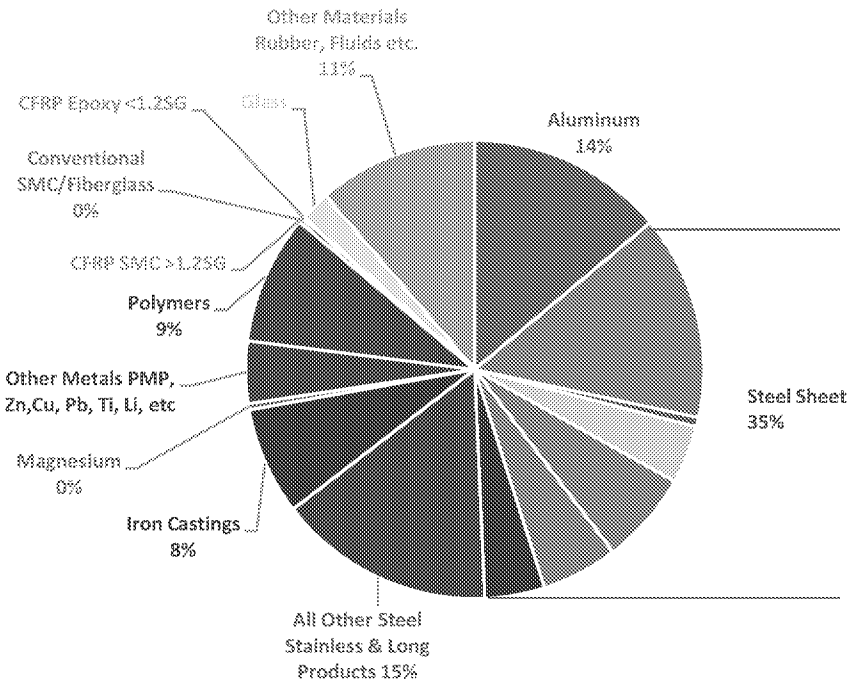
4.5% MASS REDUCTION SCENARIO - LOW ALUMINUM GROWTH AFTER 2020

The low aluminum growth scenario assumes that there is very little growth for aluminum body parts after 2020. The aluminum share of total vehicle weight will only grow to 14%.

CURB WEIGHT 3655 POUNDS

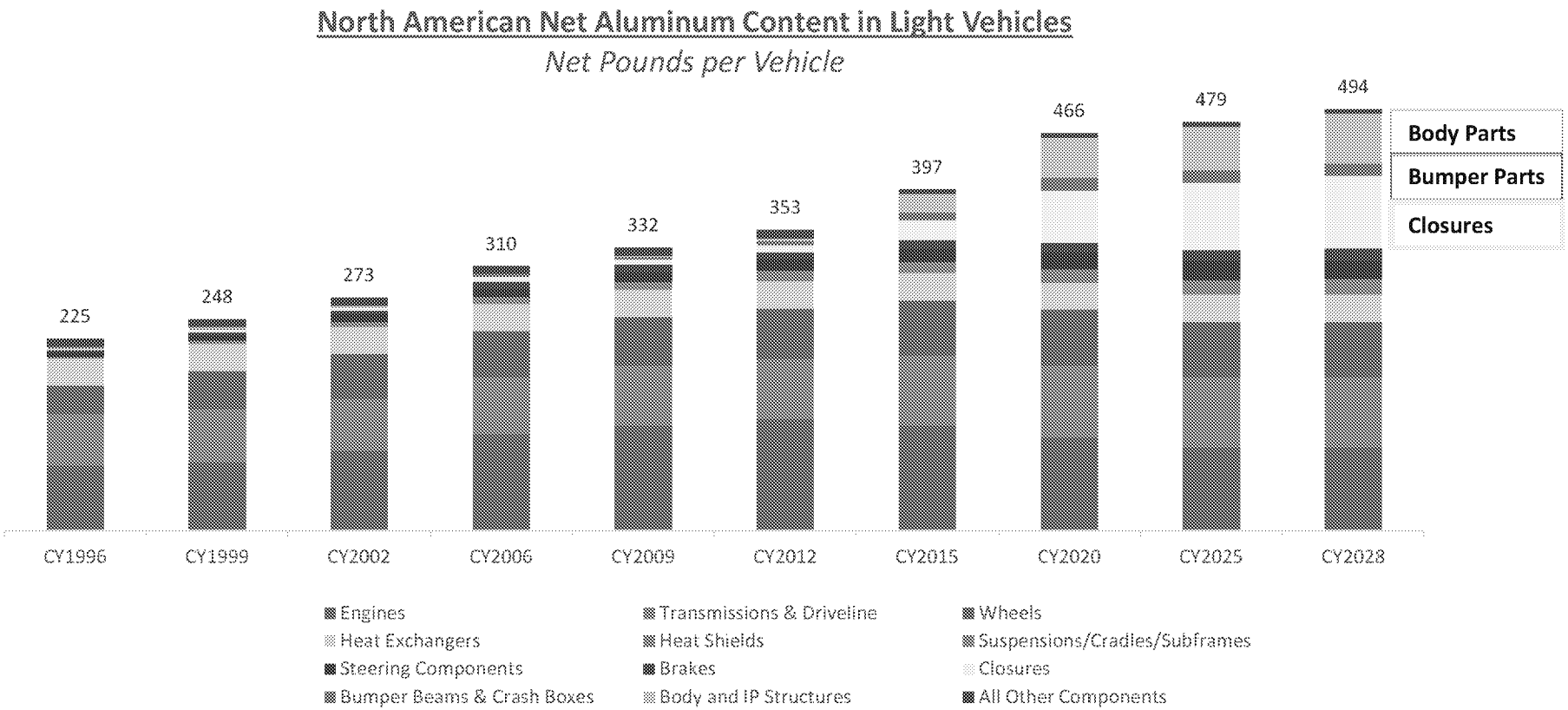
Highlights:

- This scenario only achieves a 4.5% mass savings from 2015 even with over 160 pounds per vehicle of new AHSS/UHSS parts added after 2020
- 494 total aluminum pounds (14% of total vehicle weight)
- At least 4.9 million high growth aluminum content vehicles (>400 lbs.)
- Over 550 pounds per vehicle of flat rolled AHSS/UHSS steel content, but only 46% steel overall
- Twenty one pounds for CFRP Epoxy and SMC composites
- Twenty seven pounds of magnesium
- Polycarbonate windows, and fiberglass/composite leaf springs were applied where appropriate
- Aluminum hood penetration of 90% with door penetration near 60%



4.5% MASS REDUCTION SCENARIO - LOW ALUMINUM GROWTH AFTER 2020

Total aluminum content will only increase by 28 pounds under the 4.5% mass reduction scenario due to less weight savings and aluminum losses to engine resize and magnesium substitution.



FINAL COMMENTS

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FINAL COMMENTS

- It is unclear, as yet, what the results of the 2018 Mid Term review will do to the technology path shown in TAR for 2025. It is possible that there will be no change from TAR. Ducker does believe that the effort to achieve U.S. energy independence along with a competitive market place will keep the pressure on the auto industry to keep improving the material efficiency and other characteristics of their vehicles in spite of any changes in the TAR technology path
- Assuming a curb weight reduction from 2015 of 5% or more is needed, aluminum content will continue to grow over the next ten to a fifteen years. The amount of growth will depend on the concentration of the weight savings on specific vehicle classes. 20% - 25% mass reduction on 20% of the vehicles is much better for aluminum than 5% on all the vehicles. Aluminum content growth will also depend on how much weight creep must be offset, and any improvements in the value proposition of other material relative to aluminum. Finally, an increase in the target mass reduction is estimated to be worth 30 pounds of increased aluminum content for every 1% the target mass reduction percent is increased over 5%
- Since the Ducker study for the ATG three years ago, there have been some significant changes. The most important change is in the timing of exactly when new aluminum closure and body parts are added, particulrliy for large trucks and SUVs. The emerging pattern has more aluminum added with each model change over a ten to fifteen year period until all the closures are aluminum and at least 50% the body is aluminum. This is a much different timing pattern than Ford exhibited on the F-150
- The consequences of this new patteren, which better manages the cost increases associated with aluminum BIW & Closure parts, gives competing materials and electrification a greater opportunity to impact the final outcome. Multimaterial body structures, with innovative joining methods, are much more likely than they where three years ago, and alternative powertrain technology continues to surprise everyone. Given enough time it would be a mistake to underestimate competing materials or the progress of competing technologies
- All things considered and after looking at the problem and the research from every angle, it has become clear that there is no affordable way to maintain vehicle size and achieve a 7%mass savings with concentration on light trucks without a very significant increase of high growth aluminum components
- Steel, magnesium, CFRP and polycarbonate additions are critical. Aluminum BIW & Closure parts, however, are the key to achieving both regulatory and OEM goals for vehicle improvements over the next ten to fifteen years

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THANK YOU.

This concludes our presentation. Today's presentation was prepared by Ducker Worldwide LLC. Opinions and estimates constitute judgment as of the date of this material and are subject to change without notice. Any interpretations derived from this document are the sole responsibility of the client. Reproduction without the explicit consent of Ducker Worldwide LLC is strictly prohibited.

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www.ducker.com | info@ducker.com

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Message

From: Hearing Registration-ASD [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=34BAF91EEFAE4EB9B0700A0B672A52CF-HEARING REG]
Sent: 8/21/2017 7:48:58 PM
To: Aminah Zaghab [aminah@environmentamerica.org]
Subject: RE: Public Hearing on the Reconsideration of the Midterm Evaluation Final Determination

Thank you for your interest in attending the hearing on September 6, 2017 for the notice "Request for Comment on Reconsideration of the Final Determination of the Mid-term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light-duty Vehicles; Request for Comment on Model Year 2021 Greenhouse Gas Emissions Standards" to be held at the Renaissance Washington DC Downtown Hotel in Washington DC.

If you wish to provide verbal testimony at the hearing, you must register though the following website:

https://docs.google.com/forms/d/e/1FAIpQLSc2H4k4O6Li_Yyq3_qjxFmf6zJGyZgLfX5ojmhcCzuKavPMZQ/viewform?usp=sf_link

If you will not be providing verbal testimony, you are not required to register.

Since we expect a large number of speakers, you should plan on having no more than 5 minutes to provide verbal testimony. We intend to use a panel format in which a group of approximately six individuals at a time will be seated at the front of the ballroom and will give their testimony in succession. By the day before the hearing, we will plan to send all registered testifiers a tentative schedule indicating the order of speakers.

There will not be a projector available. If your verbal testimony includes the use of graphics, please bring hard copies to provide to the EPA representatives presiding at the hearing.

There will be a call-in number for those who cannot attend in person. Once it becomes available, this number will be provided on our website at: https://www.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-ghg-emissions

The call-in number will allow remote participants to listen to the testimony, but they will not be able to provide verbal testimony over the phone or to ask questions.

If you have further questions or special needs, please contact Tad Wysor at wysor.tad@epa.gov, 734-214-4332.

From: Aminah Zaghab [mailto:aminah@environmentamerica.org]
Sent: Monday, August 21, 2017 11:06 AM
To: Hearing Registration-ASD <Hearing_Registration-ASD@epa.gov>
Subject: Re: Public Hearing on the Reconsideration of the Midterm Evaluation Final Determination

Hello,
I'd like speak at the hearing.
Best,
Aminah Zaghab

Aminah Zaghab, J.D.

Advocate, Global Warming Solutions

Environment America | Environment America Research & Policy Center

202.461.2455 (o) | 443.812.6362 (c)

--

Aminah Zaghab, J.D

Advocate, Global Warming Solutions

Environment America | Environment America Research & Policy Center

202.461.2455 (o) | 443.812.6362 (c)

Message

From: Hearing Registration-ASD [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=34BAF91EEFAE4EB9B0700A0B672A52CF-HEARING REG]
Sent: 8/21/2017 7:47:54 PM
To: Laurie Holmes [lholmes@mema.org]
Subject: RE: Speaker Registration

Thank you for your interest in attending the hearing on September 6, 2017 for the notice "Request for Comment on Reconsideration of the Final Determination of the Mid-term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light-duty Vehicles; Request for Comment on Model Year 2021 Greenhouse Gas Emissions Standards" to be held at the Renaissance Washington DC Downtown Hotel in Washington DC.

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If you have further questions or special needs, please contact Tad Wysor at wysor.tad@epa.gov, 734-214-4332.

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Monday, August 21, 2017 1:39 PM
To: Hearing Registration-ASD <Hearing_Registration-ASD@epa.gov>
Subject: Speaker Registration

Motor & Equipment Manufacturers Association (MEMA) would like to speak at the hearing on September 6.

Laurie Holmes
Senior Director, Environmental Policy
Motor & Equipment Manufacturers Association
1030 15th Street NW, Suite 500 East
Washington, DC 20005
Direct: 202-312-9247
Ex. 6 Personal Privacy (PP)

Message

From: Hearing Registration-ASD [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=34BAF91EEFAE4EB9B0700A0B672A52CF-HEARING REG]
Sent: 8/21/2017 7:47:32 PM
To: Paul Billings [Paul.Billings@lung.org]
Subject: RE: Public Hearing on the Reconsideration of the Midterm Evaluation Final Determination

Thank you for your interest in attending the hearing on September 6, 2017 for the notice "Request for Comment on Reconsideration of the Final Determination of the Mid-term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light-duty Vehicles; Request for Comment on Model Year 2021 Greenhouse Gas Emissions Standards" to be held at the Renaissance Washington DC Downtown Hotel in Washington DC.

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From: Paul Billings [mailto:Paul.Billings@lung.org]
Sent: Monday, August 21, 2017 3:10 PM
To: Hearing Registration-ASD <Hearing_Registration-ASD@epa.gov>
Subject: FW: Public Hearing on the Reconsideration of the Midterm Evaluation Final Determination

I sent this earlier this morning but I want to make sure you received it since the email address was incorrect

>>I request an opportunity to testify at the public hearing , preferably early in the morning

Thanks
Paul Billings
Senior Vice President
American Lung Association

Paul Billings

Direct 202-785-3988

Message

From: Hearing Registration-ASD [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=34BAF91EEFAE4EB9B0700A0B672A52CF-HEARING REG]
Sent: 8/21/2017 7:47:15 PM
To: Laura Kate Bender [Laura.Bender@lung.org]
Subject: RE: Speaking Request - Reconsideration of the Midterm Evaluation Final Determination

Thank you for your interest in attending the hearing on September 6, 2017 for the notice "Request for Comment on Reconsideration of the Final Determination of the Mid-term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light-duty Vehicles; Request for Comment on Model Year 2021 Greenhouse Gas Emissions Standards" to be held at the Renaissance Washington DC Downtown Hotel in Washington DC.

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https://docs.google.com/forms/d/e/1FAIpQLSc2H4k4O6Li_Yyq3_qjxFmf6zJGyZgLfX5ojmhcCzuKavPMZQ/viewform?usp=sf_link

If you will not be providing verbal testimony, you are not required to register.

Since we expect a large number of speakers, you should plan on having no more than 5 minutes to provide verbal testimony. We intend to use a panel format in which a group of approximately six individuals at a time will be seated at the front of the ballroom and will give their testimony in succession. By the day before the hearing, we will plan to send all registered testifiers a tentative schedule indicating the order of speakers.

There will not be a projector available. If your verbal testimony includes the use of graphics, please bring hard copies to provide to the EPA representatives presiding at the hearing.

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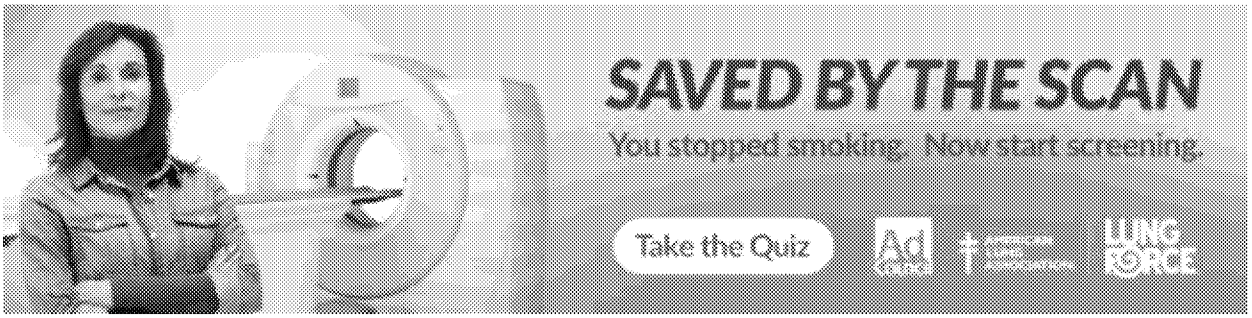
If you have further questions or special needs, please contact Tad Wysor at wysor.tad@epa.gov, 734-214-4332.

From: Laura Kate Bender [mailto:Laura.Bender@lung.org]
Sent: Monday, August 21, 2017 3:11 PM
To: Hearing Registration-ASD <Hearing_Registration-ASD@epa.gov>
Subject: Speaking Request - Reconsideration of the Midterm Evaluation Final Determination

Hello:

I'd like to request a time to speak at the 9/6/17 Washington, DC public hearing on the Reconsideration of the Midterm Evaluation Final Determination. Thank you!

Laura Kate Bender
Director of Advocacy, Healthy Air Campaign
American Lung Association
1331 Pennsylvania Ave, NW, Suite 1425 North
Washington, DC 20004
202-715-3457


SAVED BY THE SCAN
You stopped smoking. Now start screening.
Take the Quiz
Ad Council
LUNG FORCE

Message

From: Hearing Registration-ASD [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=34BAF91EEFAE4EB9B0700A0B672A52CF-HEARING REG]
Sent: 8/21/2017 7:46:44 PM
To: Ann Mesnikoff [AMesnikoff@elpc.org]
Subject: RE: Please register me for the MTE hearing

Thank you for your interest in attending the hearing on September 6, 2017 for the notice "Request for Comment on Reconsideration of the Final Determination of the Mid-term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light-duty Vehicles; Request for Comment on Model Year 2021 Greenhouse Gas Emissions Standards" to be held at the Renaissance Washington DC Downtown Hotel in Washington DC.

If you wish to provide verbal testimony at the hearing, you must register though the following website:

https://docs.google.com/forms/d/e/1FAIpQLSc2H4k4O6Li_Yyq3_qjxFmf6zJGyZgLfX5ojmhcCzuKavPMZQ/viewform?usp=sf_link

If you will not be providing verbal testimony, you are not required to register.

Since we expect a large number of speakers, you should plan on having no more than 5 minutes to provide verbal testimony. We intend to use a panel format in which a group of approximately six individuals at a time will be seated at the front of the ballroom and will give their testimony in succession. By the day before the hearing, we will plan to send all registered testifiers a tentative schedule indicating the order of speakers.

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If you have further questions or special needs, please contact Tad Wysor at wysor.tad@epa.gov, 734-214-4332.

From: Ann Mesnikoff [mailto:AMesnikoff@elpc.org]
Sent: Monday, August 21, 2017 3:17 PM
To: Hearing Registration-ASD <Hearing_Registration-ASD@epa.gov>
Subject: Please register me for the MTE hearing

Good afternoon

I would like to register for an opportunity to testify at the September 6th hearing on the Midterm Evaluation of vehicle standards.

Thank you -

Ann Mesnikoff
Federal Legislative Director
Environmental Law & Policy Center
Phone: (202) 375-8296

Email: amesnikoff@elpc.org
www.ELPC.org

Message

From: Hearing Registration-ASD [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=34BAF91EEFAE4EB9B0700A0B672A52CF-HEARING REG]
Sent: 8/21/2017 7:46:22 PM
To: Laura Kate Bender [Laura.Bender@lung.org]
Subject: RE: Additional Speaking Request - Reconsideration of the Midterm Evaluation Final Determination

Thank you for your interest in attending the hearing on September 6, 2017 for the notice "Request for Comment on Reconsideration of the Final Determination of the Mid-term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light-duty Vehicles; Request for Comment on Model Year 2021 Greenhouse Gas Emissions Standards" to be held at the Renaissance Washington DC Downtown Hotel in Washington DC.

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Since we expect a large number of speakers, you should plan on having no more than 5 minutes to provide verbal testimony. We intend to use a panel format in which a group of approximately six individuals at a time will be seated at the front of the ballroom and will give their testimony in succession. By the day before the hearing, we will plan to send all registered testifiers a tentative schedule indicating the order of speakers.

There will not be a projector available. If your verbal testimony includes the use of graphics, please bring hard copies to provide to the EPA representatives presiding at the hearing.

There will be a call-in number for those who cannot attend in person. Once it becomes available, this number will be provided on our website at: https://www.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-ghg-emissions

The call-in number will allow remote participants to listen to the testimony, but they will not be able to provide verbal testimony over the phone or to ask questions.

If you have further questions or special needs, please contact Tad Wysor at wysor.tad@epa.gov, 734-214-4332.

From: Laura Kate Bender [mailto:Laura.Bender@lung.org]
Sent: Monday, August 21, 2017 3:20 PM
To: Hearing Registration-ASD <Hearing_Registration-ASD@epa.gov>
Cc: Janice Nolen <Janice.Nolen@lung.org>
Subject: Additional Speaking Request - Reconsideration of the Midterm Evaluation Final Determination

Hello again:

I'd also like to request a time for my colleague Janice Nolen to speak at the 9/6/17 Washington, DC public hearing on the Reconsideration of the Midterm Evaluation Final Determination. She got a bounceback message when trying to register via email, so I'm submitting this request on her behalf.

Janice E. Nolen
American Lung Association
P: 202.715.3444

Janice.nolen@lung.org

Thank you!

Laura Kate Bender
Director of Advocacy, Healthy Air Campaign
American Lung Association
1331 Pennsylvania Ave, NW, Suite 1425 North
Washington, DC 20004
202-715-3457

Message

From: Hearing Registration-ASD [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=34BAF91EEFAE4EB9B0700A0B672A52CF-HEARING REG]
Sent: 8/21/2017 7:45:29 PM
To: Kathy Kinsey [kkinsey@nescaum.org]
Subject: RE: EPA-HQ-OAR-2015-0827/September 6th Public Comment Hearing on Reconsideration of GHG Standards for MY 2022-2025 LDVs

Thank you for your interest in attending the hearing on September 6, 2017 for the notice "Request for Comment on Reconsideration of the Final Determination of the Mid-term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light-duty Vehicles; Request for Comment on Model Year 2021 Greenhouse Gas Emissions Standards" to be held at the Renaissance Washington DC Downtown Hotel in Washington DC.

If you wish to provide verbal testimony at the hearing, you must register though the following website:

https://docs.google.com/forms/d/e/1FAIpQLSc2H4k4O6Li_Yyq3_qjxFmf6zJGyZgLfX5ojmhcCzuKavPMZQ/viewform?usp=sf_link

If you will not be providing verbal testimony, you are not required to register.

Since we expect a large number of speakers, you should plan on having no more than 5 minutes to provide verbal testimony. We intend to use a panel format in which a group of approximately six individuals at a time will be seated at the front of the ballroom and will give their testimony in succession. By the day before the hearing, we will plan to send all registered testifiers a tentative schedule indicating the order of speakers.

There will not be a projector available. If your verbal testimony includes the use of graphics, please bring hard copies to provide to the EPA representatives presiding at the hearing.

There will be a call-in number for those who cannot attend in person. Once it becomes available, this number will be provided on our website at: https://www.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-ghg-emissions

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From: Kathy Kinsey [mailto:kkinsey@nescaum.org]
Sent: Monday, August 21, 2017 3:25 PM
To: Hearing Registration-ASD <Hearing_Registration-ASD@epa.gov>
Subject: EPA-HQ-OAR-2015-0827/September 6th Public Comment Hearing on Reconsideration of GHG Standards for MY 2022-2025 LDVs

In accordance with EPA's request, I write to notify you that I plan to speak at the September 6th public comment hearing in the referenced matter on behalf of the Northeast States for Coordinated Air Use Management (NESCAUM). Please contact me if you have any questions.

Sincerely,

Kathy M. Kinsey
Senior Policy Advisor
Northeast States for Coordinated Air Use Management

89 South Street, Suite 602
Boston, Massachusetts 02111
240-608-5954 (mobile)

Appointment

From: Tamm, James (NHTSA) [james.tamm@dot.gov]
Sent: 6/14/2017 8:58:51 PM
To: Tamm, James (NHTSA) [james.tamm@dot.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; McCarthy, Mike@ARB [mmccarth@arb.ca.gov]

Subject: MECA on MY 2022-2025 CAFE
Location: DOT HQ and Conference Call

Start: 6/15/2017 5:00:00 PM
End: 6/15/2017 6:00:00 PM
Show Time As: Busy

Recurrence: (none)

Conference call number: Ex. 6 Personal Privacy (PP)
Access code: Ex. 6 Personal Privacy (PP)
Attendees from MECA will include:
Rasto Brezny, PhD, Executive Director
Mike Geller

Appointment

From: Wehrum, Bill [Wehrum.Bill@epa.gov]
Sent: 12/13/2017 2:05:26 PM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Harlow, David [harlow.david@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Sutton, Tia [sutton.tia@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Charmley, William [charmley.william@epa.gov]; Moran, Robin [moran.robin@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Woods, Clinton [woods.clinton@epa.gov]

Subject: Meet with National Coalition for Advanced Transportation (NCAT) (Confirmed)
Attachments: RE: Request for Meeting; Confirmed 12/13 at 4pm: Request for Meeting
Location: WJC-N 5415 + Video with AA Ex. 6 Personal Privacy (PP)

Start: 12/13/2017 2:30:00 PM
End: 12/13/2017 3:15:00 PM
Show Time As: Tentative

To: Bill Wehrum, Mandy Gunasekara, David Harlow, Alex Dominguez, Ben Hengst, Tia Sutton, Chris Grundler, Bill Charmley, Robin Moran, and Mike Olechiw, Clint Woods
Outside Attendees (in person): TBD

Confirmed 12/13 at 4pm: Request for...

RE: Request for Meeting

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 11/22/2017 1:49:21 PM
To: Robert.Wyman@LW.com
CC: Loving, Shanita [Loving.Shanita@epa.gov]
Subject: Confirmed 12/13 at 4pm: Request for Meeting

Hi Bob,

You are confirmed for a 45 minute in person meeting on Wednesday, December 13, 2017 at 4:00pm with Bill Wehrum.

Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.

Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Acting Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

-----Original Message-----
From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Tuesday, November 21, 2017 4:57 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Request for Meeting

Yes, definitely. Thank you.

From: Atkinson, Emily <Atkinson.Emily@epa.gov>
Sent: Tuesday, November 21, 2017 1:48:14 PM
To: Wyman, Robert (LA)
Cc: Loving, Shanita
Subject: RE: Request for Meeting

Hi Bob,

It looks like Bill Wehrum could be available for a 45 minute in person meeting on Wednesday, December 13, 2017 at 4:00pm.

Please advise if this could work on your end.

Thank you.
Emily

Emily Atkinson
Management Analyst/Office Manager

Immediate Office of the Acting Assistant Administrator Office of Air and Radiation, USEPA Room 5412B, 1200 Pennsylvania Avenue NW Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Friday, November 17, 2017 6:03 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Request for Meeting

Emily - thank you for speaking with me by telephone earlier today. I am writing to request a meeting with Bill Wehrum on the subject of the midterm evaluation and the national greenhouse gas emissions standards for motor vehicles. I make this request on behalf of the National Coalition for Advanced Transportation (NCAT).

NCAT is a coalition of leading companies that support electric vehicle and other advanced transportation technologies and related infrastructure, including through: energy supply, transmission and distribution; vehicle and component design and manufacturing; charging infrastructure, battery and other energy-storage technology design, production and implementation; infrastructure engineering and construction; and the movement of passengers, goods and services; among other activities. Prior to our meeting, I will provide a list of NCAT attendees.

If possible, we would like to meet with Mr. Wehrum and appropriate staff, as he determines, on Wednesday, December 13, at any time. Of course, we recognize that his schedule may not permit meeting on this date, in which case we will do our best to accommodate whatever date he selects.

Sincere thanks.

Bob

Robert A. Wyman, Jr.
LATHAM & WATKINS LLP
Email: robert.wyman@lw.com<mailto:robert.wyman@lw.com>

355 South Grand Avenue
Los Angeles, CA 90071-1560
Direct: +1.213.891.8346

555 Eleventh Street, NW
Washington, DC 20004-1304
Direct: +1.202.654.7119

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Latham & Watkins LLP

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Latham & Watkins LLP or any of its affiliates may monitor electronic communications sent or received by our networks in order to protect our business and verify compliance with our policies and relevant legal requirements.

Latham & Watkins LLP

Message

From: Charmley, William [charmley.william@epa.gov]
Sent: 4/11/2018 10:27:33 AM
To: DOUG_PATTON@denso-diam.com; ROB_BRINKER@denso-diam.com
CC: Fernandez, Antonio [fernandez.antonio@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]
Subject: RE: DENSO Meeting

Dear Doug,

I apologize for not following up on your previous outreach to me back in January/February on this topic.

I have asked Tony Fernandez and Mike Olechiw to discuss your request and follow up with you regarding getting together with Denso to discuss off-cycle technologies in May.

Best regards,

Bill

Bill Charmley
Director
Assessment and Standards Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency

National Vehicle and Fuel Emissions Laboratory
2000 Traverwood Drive
Ann Arbor, MI 48105

desk ph. 734-214-4466
Ex. 6 Personal Privacy (PP)
e-mail: charmley.william@epa.gov

From: DOUG_PATTON@denso-diam.com [mailto:DOUG_PATTON@denso-diam.com]
Sent: Tuesday, April 10, 2018 8:03 PM
To: Charmley, William <charmley.william@epa.gov>
Cc: ROB_BRINKER@denso-diam.com
Subject: DENSO Meeting

Bill
I know things are pretty hectic right now and talking to DENSO about off cycle credits Is not high on your priority list.

I will follow up toward the end of May and we can restart discussion.

It that acceptable?

Thanks
Doug

Douglas E Patton
DENSO International America

Office phone 248-372-8610
24777 DENSO Drive P.O. Box 5133
Southfield, MI 48086-5133
E-mail: doug_patton@denso-diam.com

"Charmley, William" ---04/02/2018 04:24:30 PM---Dear Stakeholder: Today EPA Administrator Pruitt has signed the Notice "Mid-term Evaluation of Green

"Charmley, William" ---04/02/2018 04:24:30 PM---Dear Stakeholder: Today EPA Administrator Pruitt has signed the Notice "Mid-term Evaluation of Green

From: "Charmley, William" <charmley.william@epa.gov>
To:
Date: 04/02/2018 04:24 PM
Subject: Notice to Stakeholders: EPA Administrator Signs Federal Register Notice "Mid-term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light-duty Vehicles"

Dear Stakeholder:

Today EPA Administrator Pruitt has signed the Notice *"Mid-term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light-duty Vehicles"*. In this notice, the Administrator finds that the model year 2022-2025 greenhouse gas standards are not appropriate in light of the record before EPA and, therefore, should be revised.

A pre-publication version of the *Federal Register* notice is attached, and is also available at the following website:

https://www.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-greenhouse-gas

Sincerely,

Bill Charmley
Director
Assessment and Standards Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency

National Vehicle and Fuel Emissions Laboratory
2000 Traverwood Drive
Ann Arbor, MI 48105

desk ph. 734-214-4466
Ex. 6 Personal Privacy (PP)
e-mail: charmley.william@epa.gov

[attachment "mte-final-determination-notice-2018-04-02.pdf" deleted by DOUG PATTON/DIAM]

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Message

From: Pierce, Philip [Philip.Pierce@harley-davidson.com]
Sent: 7/7/2017 4:37:11 PM
To: McDonald, Joseph [McDonald.Joseph@epa.gov]
CC: Haugle, Nathan [Nathan.Haugle@harley-davidson.com]; Barba, Daniel [Barba.Daniel@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]
Subject: RE: ERC Symposium

Hi Joe,
Thanks very much for pointing us to this data, it is a useful set to compare our engine's fuel consumption against. In the updated data sets coming soon will any of the data collected with CAS be included? It would be useful to see some of the calibration parameters such as ignition and injection timing as well as calculated burn durations over the maps. This type of information would help us to explain differences between our own engines and these automotive examples.
Thanks again for your help, it is greatly appreciated.
Phil

From: McDonald, Joseph [mailto:McDonald.Joseph@epa.gov]
Sent: Thursday, July 06, 2017 1:09 PM
To: Pierce, Philip
Cc: Haugle, Nathan; Barba, Daniel; Olechiw, Michael
Subject: RE: ERC Symposium

Phil,

I discussed your data request with Dan Barba, who directs EPA/OTAQ's National Center for Advanced Technology with responsibility for ALPHA model development in support of our LD GHG MTE. Dan directed me to the following on-line resources:

ALPHA webpage:

https://www.epa.gov/regulations-emissions-vehicles-and-engines/advanced-light-duty-powertrain-and-hybrid-analysis-alpha

Test Data for Light-duty Greenhouse Gas (GHG) Technology:

https://www.epa.gov/regulations-emissions-vehicles-and-engines/test-data-light-duty-greenhouse-gas-ghg-technology

Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas (GHG) Emissions Standards for Model Years 2022-2025

https://www.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-greenhouse-gas-ghg

Please note that EPA is in the process of updating the above ALPHA and benchmarking (test data) webpages to enhance webpage clarity, add additional test data, and update/enhance previously published test data and ALPHA input documents. The updates should go live in about 1 month.

Also, it should be noted (as stated on the webpage and previous MTE related documents) that ALPHA is an in-house vehicle simulation tool used by EPA, and is not intended to be a commercial product. The primary purpose of making it publically available on the website is to support our commitment to a collaborative, data-driven, transparent process for the MTE.

Best regards,

Joe

Joseph McDonald
Senior Engineer

U.S. EPA
ORD/NRMRL & OAR/OTAQ
Mail Stop: 236
26 W. Martin Luther King Dr.
Cincinnati, Ohio 45268 USA

Telephone (USA): 513-569-7421
Ex. 6 Personal Privacy (PP)
E-mail: mcdonald.joseph@epa.gov

From: Pierce, Philip [mailto:Philip.Pierce@harley-davidson.com]
Sent: Monday, June 26, 2017 4:42 PM
To: McDonald, Joseph <McDonald.Joseph@epa.gov>
Cc: Haugle, Nathan <Nathan.Haugle@harley-davidson.com>
Subject: RE: ERC Symposium

Hi Joe,
Thanks very much for the follow up. I looked through some of the papers and they provide a nice methodology for the benchmark and overall engine results which are useful. It would be great to have a look at the underlying data to better understand some of the calibration choices the manufacturers made and understand burn rates relative to our product.
I appreciate your help.
Phil

From: McDonald, Joseph [mailto:McDonald.Joseph@epa.gov]
Sent: Monday, June 26, 2017 2:45 PM
To: Pierce, Philip
Cc: Haugle, Nathan
Subject: RE: ERC Symposium

Phil,

I forwarded your request to EPA's ALPHA modeling team. I will let you know as soon as I hear back from them.

Best regards,

Joe

Joseph McDonald
Senior Engineer

U.S. EPA
ORD/NRMRL & OAR/OTAQ
Mail Stop: 236
26 W. Martin Luther King Dr.
Cincinnati, Ohio 45268 USA

Telephone (USA): 513-569-7421
Ex. 6 Personal Privacy (PP)
E-mail: mcdonald.joseph@epa.gov

From: McDonald, Joseph
Sent: Tuesday, June 20, 2017 12:23 PM
To: 'Pierce, Philip' <Philip.Pierce@harley-davidson.com>
Cc: Haugle, Nathan <Nathan.Haugle@harley-davidson.com>
Subject: RE: ERC Symposium

Phil,

It was a pleasure meeting you and your Harely-Davidson colleagues at ERC. The first place to point you is to the LD GHG MTE website:

https://www.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-greenhouse-gas-ghg

If you scroll to the very bottom of the page, you will find links to our SAE papers, some of which include detailed information on benchmarking. I will talk to the team working on the ALPHA model to see if the most recent version of the model can be downloaded along with any engine input files that are available.

Best regards,

Joe

Joseph McDonald
Senior Engineer

U.S. EPA
ORD/NRMRL & OAR/OTAQ
Mail Stop: 236
26 W. Martin Luther King Dr.
Cincinnati, Ohio 45268 USA

Telephone (USA): 513-569-7421
Ex. 6 Personal Privacy (PP)
E-mail: mcdonald.joseph@epa.gov

From: Pierce, Philip [mailto:Philip.Pierce@harley-davidson.com]
Sent: Monday, June 19, 2017 9:43 AM
To: McDonald, Joseph <McDonald.Joseph@epa.gov>
Cc: Haugle, Nathan <Nathan.Haugle@harley-davidson.com>
Subject: ERC Symposium

Hi Joe,
Thank you for your presentation in Madison last week, and for taking the time to chat with us after the dinner Wednesday. You provided a lot of food for thought. Per our conversation, having access to some of the benchmarking data that the EPA has collected would help us evaluate current automotive engine performance relative to our product. Would you please help us navigate the online resources at the EPA to locate some of this data for review?
Thanks again for your time.
Phil

Phil Pierce
Manager – Powertrain Combustion
Harley-Davidson Motor Company
11800 W. Capitol Drive
Wauwatosa, WI 53222
414 465 6727

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Sent: 7/6/2017 6:09:23 PM
To: Pierce, Philip [Philip.Pierce@harley-davidson.com]
CC: Haugle, Nathan [Nathan.Haugle@harley-davidson.com]; Barba, Daniel [Barba.Daniel@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]
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Test Data for Light-duty Greenhouse Gas (GHG) Technology:

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Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas (GHG) Emissions Standards for Model Years 2022-2025

https://www.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-greenhouse-gas-ghg

Please note that EPA is in the process of updating the above ALPHA and benchmarking (test data) webpages to enhance webpage clarity, add additional test data, and update/enhance previously published test data and ALPHA input documents. The updates should go live in about 1 month.

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Best regards,

Joe

Joseph McDonald
Senior Engineer

U.S. EPA
ORD/NRMRL & OAR/OTAQ
Mail Stop: 236
26 W. Martin Luther King Dr.
Cincinnati, Ohio 45268 USA

Telephone (USA): 513-569-7421
Ex. 6 Personal Privacy (PP)
E-mail: mcdonald.joseph@epa.gov

From: Pierce, Philip [mailto:Philip.Pierce@harley-davidson.com]
Sent: Monday, June 26, 2017 4:42 PM
To: McDonald, Joseph <McDonald.Joseph@epa.gov>
Cc: Haugle, Nathan <Nathan.Haugle@harley-davidson.com>
Subject: RE: ERC Symposium

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Best regards,

Joe

Joseph McDonald
Senior Engineer

U.S. EPA
ORD/NRMRL & OAR/OTAQ
Mail Stop: 236
26 W. Martin Luther King Dr.
Cincinnati, Ohio 45268 USA

Telephone (USA): 513-569-7421
Ex. 6 Personal Privacy (PP)
E-mail: mcdonald.joseph@epa.gov

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Cc: Haugle, Nathan <Nathan.Haugle@harley-davidson.com>
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If you scroll to the very bottom of the page, you will find links to our SAE papers, some of which include detailed information on benchmarking. I will talk to the team working on the ALPHA model to see if the most recent version of the model can be downloaded along with any engine input files that are available.

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Joe

Joseph McDonald
Senior Engineer

U.S. EPA
ORD/NRMRL & OAR/OTAQ
Mail Stop: 236
26 W. Martin Luther King Dr.
Cincinnati, Ohio 45268 USA

Telephone (USA): 513-569-7421
Ex. 6 Personal Privacy (PP)
E-mail: mcdonald.joseph@epa.gov

From: Pierce, Philip [mailto:Philip.Pierce@harley-davidson.com]
Sent: Monday, June 19, 2017 9:43 AM
To: McDonald, Joseph <McDonald.Joseph@epa.gov>
Cc: Haugle, Nathan <Nathan.Haugle@harley-davidson.com>
Subject: ERC Symposium

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Phil

Phil Pierce
Manager – Powertrain Combustion
Harley-Davidson Motor Company
11800 W. Capitol Drive
Wauwatosa, WI 53222
414 465 6727

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Message

From: Cherry, Jeff [Cherry.Jeff@epa.gov]
Sent: 5/17/2018 12:36:28 PM
To: Yoo, Sanghoon [SHYoo@hatci.com]
CC: Lee, Byungho [BLee@hatci.com]; Gantchar, John [JGantchar@hatci.com]; French, Roberts [french.roberts@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]
Subject: RE: Request of EPA ALPHA model

Sanghoon,

ALPHA 2.x was used for the midterm evaluation process from the Technical Assessment Report (TAR) through the Proposed Determination (PD).

The model is posted along with all data used in our analysis and you are free to use it for any purpose including off-cycle calculations. As the total list of possible off-cycle technologies is unknown, the GUI was dropped so any technology could be considered.

I would recommend using the ALPHA 2.1 calibration samples. There is a selection of vehicles and powertrains available to modify as needed for your project. If you need to go beyond changing M-Files and dive into the Simulink models, you may find some of the submodules locked but this is just to prevent accidental changes. There are no passwords so they can be unlocked as needed to view/change anything in the model.

Best regards,

Jeff

Jeff Cherry
Assessment & Standards Division
United States Environmental Protection Agency
Office of Transportation and Air Quality
National Vehicle Fuels and Emissions Laboratory
2000 Traverwood Drive
Ann Arbor, MI 48105
Voice: 734-214-4371
cherry.jeff@epa.gov

From: Yoo, Sanghoon [mailto:SHYoo@hatci.com]
Sent: Wednesday, May 16, 2018 5:23 PM
To: Cherry, Jeff <Cherry.Jeff@epa.gov>
Cc: Lee, Byungho <BLee@hatci.com>; Gantchar, John <JGantchar@hatci.com>
Subject: FW: Request of EPA ALPHA model

Hello Jeff,

This is Sanghoon Yoo in HATCI powertrain department.
I followed the link below, and found ALPHA 2.0 simulation samples.

Can we use this sample model for off-cycle credit calculations? It seems that the sample model does not have GUI, but it does have a variety of m-files containing all parameters.
It looks like I have to change the m-files inside the model for parameter adjustment.

I really appreciate your support.

Thanks,

Sanghoon Yoo
Hyundai-Kia America Technical Center, Inc.
Fuel Economy Development Control Engineer
HATCI Powertrain Department
6800 Geddes Rd, Superior Township, MI 48198
Office : (734) 337-2229
E-mail: SHYoo@hatci.com

CUSTOMER CHALLENGE COLLABORATION PEOPLE GLOBALITY

From: Gantchar, John
Sent: Wednesday, May 16, 2018 4:32 PM
To: Yoo, Sanghoon
Cc: Lee, Byungho; Babcock, Robert
Subject: FW: Request of EPA ALPHA model

Hi Sanghoon,

Please read Roberts French email for the EPA contact if you have further questions.

John

From: French, Roberts [mailto:french.roberts@epa.gov]
Sent: Wednesday, May 16, 2018 12:19 PM
To: Gantchar, John
Subject: FW: Request of EPA ALPHA model

John,

See note below and contact Jeff Cherry with questions about ALPHA.

Rob

Roberts W. French, Jr.
U.S. Environmental Protection Agency
National Vehicle and Fuel Emissions Laboratory
2000 Traverwood Drive
Ann Arbor, Michigan 48105
(734) 214-4380

From: Cherry, Jeff
Sent: Wednesday, May 16, 2018 10:19 AM
To: French, Roberts <french.roberts@epa.gov>
Subject: RE: Request of EPA ALPHA model

Rob,

Any version of ALPHA may be used for off cycle calculations. Version 2.0 is on that webpage if this is the particular version desired. ALPHA 1.0 is the original calculator for off cycle but is limited to specific technologies.

Have HATCI contact me directly for more information if needed.

Best regards,

Jeff

Jeff Cherry
Assessment & Standards Division
United States Environmental Protection Agency
Office of Transportation and Air Quality
National Vehicle Fuels and Emissions Laboratory
2000 Traverwood Drive
Ann Arbor, MI 48105
Voice: 734-214-4371
cherry.jeff@epa.gov

From: French, Roberts
Sent: Wednesday, May 16, 2018 9:04 AM
To: Cherry, Jeff <Cherry.Jeff@epa.gov>
Subject: FW: Request of EPA ALPHA model

Jeff,

Got another link for ALPHA?

Thanks,
Rob

Roberts W. French, Jr.
U.S. Environmental Protection Agency
National Vehicle and Fuel Emissions Laboratory
2000 Traverwood Drive
Ann Arbor, Michigan 48105
(734) 214-4380

From: Gantchar, John [mailto:JGantchar@hatci.com]
Sent: Wednesday, May 16, 2018 9:02 AM
To: French, Roberts <french.roberts@epa.gov>; Good, David <good.david@epa.gov>
Cc: Cullen, Daniel <Cullen.Daniel@epa.gov>; Babcock, Robert <rbabcock@hatci.com>; Beyette, Brogan <BBeyette@hatci.com>
Subject: RE: Request of EPA ALPHA model

Hi Rob,

HATCI that is looking into using the ALPHA 2.0 model for their off-cycle credit applications , we couldn't find it on the website you provided us. Other OEMs (Ford, GM, etc.) said that they had run ALPHA 2.0 in their off-cycle credit applications and we believe that they obtained the model from EPA.

We would appreciate it if you could check, again, for the ALPHA 2.0 model and send it to us.

Thank-you

John

From: French, Roberts [mailto:french.roberts@epa.gov]
Sent: Tuesday, May 15, 2018 9:47 AM
To: Gantchar, John; Good, David
Cc: Cullen, Daniel; Babcock, Robert; Beyette, Brogan
Subject: RE: Request of EPA ALPHA model

John,

The publicly available version of the ALPHA model is here:

https://www.epa.gov/regulations-emissions-vehicles-and-engines/advanced-light-duty-powertrain-and-hybrid-analysis-alpha

Rob

Roberts W. French, Jr.
U.S. Environmental Protection Agency
National Vehicle and Fuel Emissions Laboratory
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(734) 214-4380

Message

From: Amandine Muskus [amuskus@globalautomakers.org]
Sent: 2/6/2018 7:18:19 PM
To: Fernandez, Antonio [fernandez.antonio@epa.gov]; Giedrius Ambrozaitis [gambrozaitis@autoalliance.org]; Wysor, Tad [wysor.tad@epa.gov]
CC: Olechiw, Michael [olechiw.michael@epa.gov]
Subject: RE: Amandine and Giedrius -- More info about Industry/EPA meeting

Hi Tony,

Thank you for the clarification. I will just plan on the conference call number then.

Best,
Amandine Muskus
Manager, Environment & Energy
Association of Global Automakers, Inc. (Global Automakers)
1050 K Street, NW, Suite 650
Washington, DC 20001
202.650.5547 (direct)
202.650.5555 (main)
amuskus@globalautomakers.org

GlobalAutomakers

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From: Fernandez, Antonio [mailto:fernandez.antonio@epa.gov]
Sent: Tuesday, February 6, 2018 1:35 PM
To: Amandine Muskus <amuskus@globalautomakers.org>; Giedrius Ambrozaitis <gambrozaitis@autoalliance.org>; Wysor, Tad <wysor.tad@epa.gov>
Cc: Olechiw, Michael <olechiw.michael@epa.gov>
Subject: RE: Amandine and Giedrius -- More info about Industry/EPA meeting

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Tony

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To: Fernandez, Antonio <fernandez.antonio@epa.gov>; Giedrius Ambrozaitis <gambrozaitis@autoalliance.org>; Wysor, Tad <wysor.tad@epa.gov>
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To: Giedrius Ambrozaitis; Wysor, Tad
Cc: Amandine Muskus; Olechiw, Michael
Subject: RE: Amandine and Giedrius -- More info about Industry/EPA meeting

Good. We have the large conference room in the front lobby. If you are going to have people calling in, please arrange the call-in number with them ahead of Friday.

Thanks
Tad and Tony

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Sent: Tuesday, February 06, 2018 1:06 PM
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Cc: Amandine Muskus <amuskus@globalautomakers.org>; Olechiw, Michael <olechiw.michael@epa.gov>; Fernandez, Antonio <fernandez.antonio@epa.gov>
Subject: Re: Amandine and Giedrius -- More info about Industry/EPA meeting

Tad and Tony -
Thanks again - yes Friday 1-3pm works for our members.

Amandine and Giedrius

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Looking forward to the meeting.
Amandine and Giedrius

From: Amandine Muskus [amuskus@globalautomakers.org]
Sent: Monday, February 05, 2018 5:04 PM
To: Wysor, Tad; Giedrius Ambrozaitis
Cc: Olechiw, Michael; Tony Fernandez
Subject: RE: Amandine and Giedrius -- More info about Industry/EPA meeting

Dear Tad,

Thank you for the update. We are consulting with our members to coordinate potential dates to offer to you all. Are there any additional specifics that you may be able to provide to us so that we can have our group be well prepared?

Thank you in advance.

Best,
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Cc: Olechiw, Michael <olechiw.michael@epa.gov>; Fernandez, Antonio <fernandez.antonio@epa.gov>
Subject: Amandine and Giedrius -- More info about Industry/EPA meeting

Giedrius and Amandine...

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proposed implementation schedule that we think would respond to the industry testing-burden concerns.

Now that this is moving, but still at an early stage, our staff would like to share our thinking about these topics with the appropriate staff from all of your members as soon as possible. Of course, we would also want to hear any questions about or issues with our recently-released Technical Report describing the EPA vehicle test program.

We would like to hold this meeting very soon, before we need to move forward in the Agency process. Let us know of anything else we can do to help make this happen.

Tad Wysor
Tony Fernandez

From: Fernandez, Antonio
Sent: Thursday, January 11, 2018 4:54 PM
To: Ambrozaitis, Giedrius (Alliance) <gambrozaitis@autoalliance.org>; Amandine Muskus <amuskus@globalautomakers.org>
Cc: Wysor, Tad <wysor.tad@epa.gov>; Olechiw, Michael <olechiw.michael@epa.gov>
Subject: RE: EPA Tier 3 fuel Impacts Test Program

Giedrius and Amandine,
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Please let us know your thoughts.

Thank you
Tony Fernandez

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https://www.epa.gov/moves/tier-3-certification-fuel-impacts-test-program

Thank you for your interest and support.

Tony Fernandez

Message

From: Fernandez, Antonio [fernandez.antonio@epa.gov]
Sent: 2/6/2018 6:35:10 PM
To: Amandine Muskus [amuskus@globalautomakers.org]; Giedrius Ambrozaitis [gambrozaitis@autoalliance.org]; Wysor, Tad [wysor.tad@epa.gov]
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Cc: Amandine Muskus; Olechiw, Michael
Subject: RE: Amandine and Giedrius -- More info about Industry/EPA meeting

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Sent: Monday, February 05, 2018 5:04 PM
To: Wysor, Tad; Giedrius Ambrozaitis
Cc: Olechiw, Michael; Tony Fernandez
Subject: RE: Amandine and Giedrius -- More info about Industry/EPA meeting

Dear Tad,

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Manager, Environment & Energy

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Thank you for your interest and support.

Tony Fernandez

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amuskus@globalautomakers.org
<image001.png>
<image002.jpg> <image003.jpg>
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From: Wysor, Tad [mailto:wysor.tad@epa.gov]
Sent: Monday, February 5, 2018 12:18 PM
To: Ambrozaitis, Giedrius (Alliance) <gambrozaitis@autoalliance.org>; Amandine Muskus

<amuskus@globalautomakers.org>
Cc: Olechiw, Michael <olechiw.michael@epa.gov>; Fernandez, Antonio <fernandez.antonio@epa.gov>
Subject: Amandine and Giedrius -- More info about Industry/EPA meeting

Giedrius and Amandine...

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Sent: Thursday, January 11, 2018 4:54 PM
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Cc: Wysor, Tad <wysor.tad@epa.gov>; Olechiw, Michael <olechiw.michael@epa.gov>
Subject: RE: EPA Tier 3 fuel Impacts Test Program

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Thank you for your interest and support.

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From: Fernandez, Antonio [fernandez.antonio@epa.gov]
Sent: 2/6/2018 6:12:48 PM
To: Giedrius Ambrozaitis [gambrozaitis@autoalliance.org]; Wysor, Tad [wysor.tad@epa.gov]
CC: Amandine Muskus [amuskus@globalautomakers.org]; Olechiw, Michael [olechiw.michael@epa.gov]
Subject: RE: Amandine and Giedrius -- More info about Industry/EPA meeting

Good. We have the large conference room in the front lobby. If you are going to have people calling in, please arrange the call-in number with them ahead of Friday.

Thanks
Tad and Tony

From: Giedrius Ambrozaitis [mailto:gambrozaitis@autoalliance.org]
Sent: Tuesday, February 06, 2018 1:06 PM
To: Wysor, Tad <wysor.tad@epa.gov>
Cc: Amandine Muskus <amuskus@globalautomakers.org>; Olechiw, Michael <olechiw.michael@epa.gov>; Fernandez, Antonio <fernandez.antonio@epa.gov>
Subject: Re: Amandine and Giedrius -- More info about Industry/EPA meeting

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To: Wysor, Tad; Giedrius Ambrozaitis
Cc: Olechiw, Michael; Tony Fernandez
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Tony Fernandez

Appointment

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/28/2018 3:17:59 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Cook, Leila [cook.leila@epa.gov]; Charmley, William [charmley.william@epa.gov]
CC: Moran, Robin [moran.robin@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Caffrey, Cheryl [caffrey.cheryl@epa.gov]

Subject: Meet with Aluminum Association - Aluminum Transport Group Members (Confirmed)
Attachments: Aluminum Association Meeting Request; Confirmed 3/2 at 3pm: Aluminum Association Meeting Request; Confirmed 3/1 at 4pm: Aluminum Association Meeting Request; RE: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request
Location: WJC-N 5400 + Video with AA

Start: 3/1/2018 9:00:00 PM
End: 3/1/2018 9:45:00 PM
Show Time As: Tentative

Re: automotive GHG emissions and fuel economy regulations
To: Bill Wehrum, Mandy Gunasekara, Chris Grundler, Ben Hengst, Lee Cook, Bill Charmley
Outside Attendees (in person):

- Henry Gordinier, Tri-Arrows
- Ganesh Panneer, Novelis
- Delphine Dahan-Kocher, Constellium
- Dan Minwell, Constellium
- Mario Greco, Arconic
- Mike Belwood, Arconic
- Joe Quinn, Aluminum Association
- Matt Meenan, Aluminum Association
- John Fitzpatrick, Stratacomm

Aluminum Association Meet... | Confirmed 3/2 at 3pm: Aluminum ... | Confirmed 3/1 at 4pm: Aluminum ... | RE: Confirmed 3/1 at 4pm: Aluminu...

Message

From: Lauren Wilk [lwilk@aluminum.org]
Sent: 2/1/2018 5:05:48 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]
Subject: Aluminum Association Meeting Request

Emily and Josh --

Will Lovett suggested I connect with you on scheduling a meeting with Assistant Administrator Wehrum for a few representatives of the aluminum industry. We have availability on the following dates: February 16, 20, 21, 23, 26, 27, 28 or March 1 (but we can certainly be flexible if an alternative date is necessary).

The Aluminum Association is active with EPA on a number of issues -- and specifically, the members of our Aluminum Transportation Group (ATG) would very much like to hear directly from Mr. Wehrum about the Administration's priorities related to automotive GHG emissions and fuel economy regulations. The ATG represents the Association's member companies that produce aluminum for use in cars and trucks, including Alcoa, Arconic, Novelis, Rio Tinto and others.

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I'd be happy to answer any questions or provide additional background, if that's helpful.

Thanks so much,

Lauren

The Aluminum Association

Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/7/2018 8:01:58 PM
To: Lauren Wilk [lwilk@aluminum.org]
Subject: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request

Hi Lauren,
You are confirmed for 45 minute meeting on Thursday, March 1, 2018 at 4:00pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Wednesday, February 07, 2018 2:59 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Thanks so much, Emily. That's perfect.

I'll circle back, closer to the meeting, with a list of attendees. Let me know if you need anything else in the meantime.

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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
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Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Wednesday, February 07, 2018 11:01 AM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi, Emily. One of the technical experts I was hoping to bring in for our meeting with Mr. Wehrum will unfortunately be out of the country on Friday 3/2. Is there any chance that Mr. Wehrum would be available to meet on Thursday 3/1, or sometime March 12-16? If not, we'll keep our March 2 meeting and I'll have my colleague prepare his technical materials in advance.

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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Tuesday, February 06, 2018 9:25 AM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi Lauren,

Yes, we could accommodate a group of 8 attending this meeting.

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Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Monday, February 05, 2018 2:52 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Re: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Thanks, Emily. I appreciate your help in getting this nailed down.

I would like to invite a few member company representatives to join, so I'm curious if there's a hard limit on number of attendees — would 6-8 (as a total group size) be workable?

Best,

Lauren

Lauren Wilk
The Aluminum Association
Office: (703) 358-2981

On Mon, Feb 5, 2018 at 2:38 PM -0500, "Atkinson, Emily" <Atkinson.Emily@epa.gov> wrote:

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From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Monday, February 05, 2018 12:56 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Aluminum Association Meeting Request

Thanks, Emily. We'll take the meeting on March 2 at 3pm, and I'll firm up attendees on our end.

Let me know what details you need in advance of the meeting.

Much appreciated!

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Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Thursday, February 01, 2018 12:06 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Aluminum Association Meeting Request

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Message

From: Lauren Wilk [lwilk@aluminum.org]
Sent: 2/28/2018 3:13:28 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]
CC: Matt Meenan [mmeenan@aluminum.org]
Subject: RE: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request

Hi, Emily. I wanted to send you a list of attendees for tomorrow's meeting at EPA. My colleague Matt Meenan (copied here) will be with the group, if you need to reach him for any reason. Please let me know if you need any additional information from me in advance of the meeting.

- Henry Gordinier, Tri-Arrows
- Ganesh Panneer, Novelis
- Delphine Dahan-Kocher, Constellium
- Dan Minwell, Constellium
- Mario Greco, Arconic
- Mike Belwood, Arconic
- Joe Quinn, Aluminum Association
- Matt Meenan, Aluminum Association
- John Fitzpatrick, Stratacomm

Much appreciated!

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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, February 07, 2018 3:02 PM
To: Lauren Wilk <lwilk@aluminum.org>
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JOIN THE CONVERSATION:

Message

From: Dickinson, David [Dickinson.David@epa.gov]
Sent: 11/29/2017 9:04:30 PM
To: Magnall, Deena EOP/USTR [Ex. 6 - Personal Privacy]
CC: Trick, Bryant P. EOP/USTR [Ex. 6 - Personal Privacy]; Olechiw, Michael [olechiw.michael@epa.gov]
Subject: RE: Follow Up Info re USTR talks with S Korea re various emission standards, etc

Hi Deena –

I also wanted to follow up with you regarding the issue of diesel emissions from light and heavy-duty vehicles and real world test data of US06 vehicles versus Euro vehicles.

http://www.theicct.org/news/road-tested-sep2017-press-release

http://www.theicct.org/news/press-release-new-icct-study-shows-real-world-exhaust-emissions-modern-diesel-cars-seven-times

http://www.theicct.org/sites/default/files/publications/Euro-VI-versus-6_ICCT_briefing_06012017_revised.pdf

David

From: Magnall, Deena EOP/USTR [mailto: Ex. 6 - Personal Privacy]
Sent: Wednesday, November 22, 2017 12:33 PM
To: Dickinson, David <Dickinson.David@epa.gov>
Cc: Trick, Bryant P. EOP/USTR <Ex. 6 - Personal Privacy Olechiw, Michael <olechiw.michael@epa.gov>
Subject: RE: Follow Up Info re USTR talks with S Korea re various emission standards, etc

Hi David,

Looks like Emb Seoul managed to track down English versions from the KAIDA website for two of the regs. I've asked if they would be able to provide a translation for the third one, so I'll let you know what I hear back.

Happy Thanksgiving.

Thanks,
Deena

From: Dickinson, David [mailto:Dickinson.David@epa.gov]
Sent: Thursday, November 16, 2017 1:06 PM
To: Magnall, Deena EOP/USTR <Deena_Magnall@ustr.eop.gov>
Cc: Trick, Bryant P. EOP/USTR <Bryant_Trick@ustr.eop.gov>; Olechiw, Michael <olechiw.michael@epa.gov>
Subject: RE: Follow Up Info re USTR talks with S Korea re various emission standards, etc

Hi Deena –

I look forward to seeing the information the Koreans sent, once it is translated.

With regard to on-highway recreational vehicles (sometimes known as motorhomes – RVs), the certifying manufacturer sells a bare chassis or cab chassis to an RV buillder. This is known as an incomplete vehicle or incomplete chassis.

40 CFR Part 1036 and Part 1037 governs requirements for heavy-duty engines and heavy-duty vehicles. A vehicle under 1037 must use a certified engine from 1036, again the applicable standards are the heavy-duty engine standards as set forth in40 CFR Part 86. For example, 40 CFR 86.1948-01 prescibes the requirements for incomplete heavy-duty vehicles.

Depending upon the completed weight of the heavy-duty vehicle it would be subject to differing emission levels (e.g. HD 2b/3 requirements, etc).
>https://www.dieselnet.com/standards/us/hd.php<

1036.1 Does this part apply for my engines?

(a) Except as specified in §1036.5, the provisions of this part apply for engines that will be installed in heavy-duty vehicles (including glider vehicles) above 14,000 pounds GVWR for propulsion. These provisions also apply for engines that will be installed in incomplete heavy-duty vehicles at or below 14,000 pounds GVWR unless the engine is installed in a vehicle that is covered by a certificate of conformity under 40 CFR part 86, subpart S.

(b) This part does not apply with respect to exhaust emission standards for HC, CO, NO_x, or PM except as follows:

(1) The provisions of §1036.601 apply.

(2) 40 CFR parts 85 and/or 86 may specify that certain provisions apply.

(c) The provisions of this part also apply for fuel conversions of all engines described in paragraph (a) of this section as described in 40 CFR 85.502.

(d) Gas turbine heavy-duty engines and other heavy-duty engines not meeting the definition *compression-ignition* or *spark-ignition* are deemed to be compression-ignition engines for purposes of this part

I should be able to get you something re the US06 ve Euro 6 issue tomorrow or early next week,

David

From: Magnall, Deena EOP/USTR [mailto: Ex. 6 - Personal Privacy
Sent: Tuesday, November 14, 2017 10:57 AM
To: Dickinson, David <Dickinson.David@epa.gov>
Cc: Trick, Bryant P. EOP/USTR < Ex. 6 - Personal Privacy Olechiw, Michael <olechiw.michael@epa.gov>
Subject: RE: Follow Up Info re USTR talks with S Korea re various emission standards, etc

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Deena

From: Magnall, Deena EOP/USTR
Sent: Thursday, October 26, 2017 12:23 PM
To: 'Dickinson, David' <Dickinson.David@epa.gov>
Cc: Trick, Bryant P. EOP/USTR <Ex. 6 - Personal Privacy; Olechiw, Michael <olechiw.michael@epa.gov>
Subject: RE: Follow Up Info re USTR talks with S Korea re various emission standards, etc

Hi David,

Yes, your list seems in line with what we have on our end. I've asked Emb Seoul to help us track down the info from MOE on model family, assigned DF, and Econ Innovation Credits list. From EPA, it would be great if we could get more info for the Koreans on RVs and U.S. diesel standards as they compare to Euro 6 (believe they were looking for data or scientific papers).

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Deena

From: Dickinson, David [mailto:Dickinson.David@epa.gov]
Sent: Monday, October 23, 2017 2:23 PM
To: Magnall, Deena EOP/USTR <Ex. 6 - Personal Privacy>
Cc: Trick, Bryant P. EOP/USTR Ex. 6 - Personal Privacy Olechiw, Michael <olechiw.michael@epa.gov>
Subject: RE: Follow Up Info re USTR talks with S Korea re various emission standards, etc

Hello Deena and Bryant –

In this interest of following up on the call from last Friday with S. Korea, and because my notes are spotty, are there items you'd like from EPA?

1. The engine, vehicle, model family issue: Since EPA described the durability group and test group concepts for light-duty (LD) (we have slightly different concepts for heavy-duty (HD) but similar themes of grouping model lines with similar characteristics for engine and vehicle families). I believe S. Korea planned to follow up (e.g. provide USTR with English version of their regulation(s)).
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Sent: Thursday, October 19, 2017 1:35 PM

To: Dickinson, David <Dickinson.David@epa.gov>
Cc: Trick, Bryant P. EOP/USTR Ex. 6 - Personal Privacy Olechiw, Michael <olechiw.michael@epa.gov>
Subject: RE: Follow Up Info re USTR talks with S Korea re various emission standards, etc

Great, thanks David. Nice to meet you, Mike. Appreciate your joining our call so early.

I'll get back to you with the phone number. As for a call today, I have another conf call from 2pm to 3pm, and then another meeting at 315. I can chat any time after 345, however. Would that work?

From: Dickinson, David [mailto:Dickinson.David@epa.gov]
Sent: Thursday, October 19, 2017 1:30 PM
To: Magnall, Deena EOP/USTR Ex. 6 - Personal Privacy
Cc: Trick, Bryant P. EOP/USTR Ex. 6 - Personal Privacy Olechiw, Michael <olechiw.michael@epa.gov>
Subject: Follow Up Info re USTR talks with S Korea re various emission standards, etc

Deena –

I am including Mike Olechiw, a manager in OTAQ's office in Ann Arbor – he is available for the call tomorrow morning at 8 a.m. (I will attend in person). Please provide a call in number for Mike. Mike can cover both the Euro 6 test procedures vs US for light-duty and heavy-duty. He can also cover the curves for greenhouse gas for cars vs trucks.

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In addition to the 2 issues noted above, I believe 2 other issues remain – 1. How vehicles are grouped and certified in US system and 2. How on-road recreational vehicles are certified in the US system.

For issue 1 (vehicle groupings) EPA uses both durability groups and test groups (EPA certifies models under test groups), test groups tend to be a subset within durability groups – below are links to the relevant reg cites and reg language.

I will get back to you re issue 2, and we will be forwarding info pertaining to the Euro 6 issues and the GHG curves for cars and trucks.

David

>>>https://www.law.cornell.edu/cfr/text/40/86.1820-01<<<;;

>>>https://www.law.cornell.edu/cfr/text/40/86.1827-01<<<;;

§ 86.1820-01 Durability group determination.

This section applies to the grouping of vehicles into durability groups. Manufacturers shall divide their product line into durability groups based on the following criteria:

(a) The vehicles covered by a certification application shall be divided into groups of vehicles which are expected to have similar emission deterioration and emission component durability characteristics throughout

their useful life. Manufacturers shall use good engineering judgment in dividing their vehicles into durability groups. Such groups of vehicles are defined as durability groups.

(b) To be included in the same durability group, vehicles must be identical in all the respects listed in paragraphs (b) (1) through (7) of this section:

(1) Combustion cycle (e.g., two stroke, four stroke, Otto cycle, diesel cycle).

(2) Engine type (e.g., piston, rotary, turbine, air cooled versus water cooled).

(3) Fuel used (e.g., gasoline, diesel, methanol, ethanol, CNG, LPG, flexible fuels).

(4) Basic fuel metering system (e.g., throttle body injection, port injection (including central port injection), carburetor, CNG mixer unit).

(5) Catalyst construction (for example, beads or monolith).

(6) Precious metal composition of the catalyst by the type of principal active material(s) used (e.g., platinum based oxidation catalyst, palladium based oxidation catalyst, platinum and rhodium three-way catalyst, palladium and rhodium three way catalyst, platinum and palladium and rhodium three way catalyst).

(7) The manufacturer must choose one of the following two criteria:

(i) Grouping statistic:

(A) Vehicles are grouped based upon the value of the grouping statistic determined using the following equation:

GS = [(Cat Vol)/(Disp)] × Loading Rate
Where:
GS = Grouping Statistic used to evaluate the range of precious metal loading rates and relative sizing of the catalysts compared to the engine displacement that are allowable within a durability group. The grouping statistic shall be rounded to a tenth of a gram/liter.
Cat Vol = Total volume of the catalyst(s) in liters.
Disp = Displacement of the engine in liters.
Loading rate = The mass of total precious metal(s) in the catalyst (or the total mass of all precious metal(s) of all the catalysts if the vehicle is equipped with multiple catalysts) in grams divided by the total volume of the catalyst(s) in liters.

(B) Engine-emission control system combinations which have a grouping statistic which is either less than 25 percent of the largest grouping statistic value, or less than 0.2 g/liter (whichever allows the greater coverage of the durability group) shall be grouped into the same durability group.

(ii) The manufacturer may elect to use another procedure which results in at least as many durability groups as required using criteria in paragraph (b)(7)(i) of this section providing that only vehicles with similar emission deterioration or durability are combined into a single durability group.

(c) Where vehicles are of a type which cannot be divided into durability groups based on the criteria listed above (such as non-catalyst control system approaches), the Administrator will establish durability groups for those vehicles based upon the features most related to their exhaust emission deterioration characteristics.

(d) Manufacturers may further divide groups determined under paragraph (b) of this section provided the Administrator is notified of any such changes prior to or concurrently with the submission of the application for certification (preferably at an annual preview meeting scheduled before the manufacturer begins certification activities for the model year).

(e) Manufacturers may request the Administrator's approval to combine vehicles into a single durability group which would normally not be eligible to be in a single durability group. The petition should provide:

(1) Substantial evidence that all the vehicles in the larger grouping will have the same degree of emission deterioration;

(2) Evidence of equivalent component durability over the vehicle's useful life; and

(3) Evidence that the groups will result in sufficient In-Use Verification Program data, appropriate tracking in use, and clear liability for the Agency's recall program.

§ 86.1827-01 Test group determination.

This section applies to the grouping of vehicles into test groups within a durability group. The vehicles covered by an application within a durability group shall be divided into test groups based on the following criteria. The manufacturer shall use good engineering judgment in grouping vehicles into test groups.

(a) To be included in the same test group, vehicles must be identical in all following respects:

(1) Durability group;

(2) Engine displacement (within a total band width of 15 percent of the largest displacement or 50 CID, whichever is larger);

(3) Number of cylinders or combustion chambers;

(4) Arrangement of cylinders or combustion chambers (e.g. in-line, v-shaped);

(5) Subject to the same emission standards (except for CO2), or FEL in the case of cold temperature NMHC standards, except that a manufacturer may request to group vehicles into the same test group as vehicles subject to more stringent standards, so long as all the vehicles within the test group are certified to the most stringent standards applicable to any vehicle within that test group. Light-duty trucks and light-duty vehicles may be included in the same test group if all vehicles in the test group are subject to the same emission standards, with the exception of the CO2 standard and/or the total HC standard.

(b) Where vehicles are of a type which cannot be divided into test groups based on the criteria listed above (such as non-cylinder engines), the Administrator will establish test groups for those vehicles based upon the features most related to their exhaust emission characteristics.

(c) Manufacturers may further divide groups determined under paragraph (a) of this section providing the Administrator is notified in advance of any such changes in writing.

(d) Manufacturers may request the Administrator's approval to combine vehicles into a single test group which would normally not be eligible to be in a single test group. The petition should provide:

(1) Substantial evidence that all the vehicles in the larger grouping will have the similar levels of emissions;

(2) Evidence of equivalent component durability over the vehicle's useful life;

(3) Evidence that the groups will result in sufficient in-use verification program data, appropriate tracking in use, and clear liability for the Agency's recall program; and

(4) A statement that all vehicles within a test group are certified to the most stringent standards applicable to any vehicle within that test group.

(e) Unless otherwise approved by the Administrator, a manufacturer of hybrid electric vehicles must create separate test groups based on both the type of battery technology employed by the HEV and upon features most related to their exhaust emission characteristics.

(f) Unless otherwise approved by the Administrator, a manufacturer of electric vehicles must create separate test groups based on the type of battery technology, the capacity and voltage of the battery, and the type and size of the electric motor.

[64 FR 23925, May 4, 1999, as amended at 65 FR 6864, Feb. 10, 2000; 65 FR 59974, Oct. 6, 2000; 72 FR 8566, Feb. 26, 2007; 75 FR 25689, May 7, 2010]

Message

From: Dickinson, David [Dickinson.David@epa.gov]
Sent: 11/29/2017 8:52:59 PM
To: Magnall, Deena EOP/USTR [Ex. 6 - Personal Privacy]
CC: Trick, Bryant P. EOP/USTR [Ex. 6 - Personal Privacy]; Olechiw, Michael [olechiw.michael@epa.gov]
Subject: RE: Follow Up Info re USTR talks with S Korea re various emission standards, etc

Deena –

Thank you for sending the two attachments in your email below, including their write up on credits for eco-innovation.

I recall that the Auto manufacturers were expressing concern that Korea was not consistent with US regulatory practice for credits (Air conditioning performance, off-cycle CO2 reducing technologies) under the vehicle greenhouse gas program. I haven't seen a side by side comparison, but I am linking a fact sheet pertaining to the US rule, as well as a link to EPA's GHG regulation for light-duty vehicles.

40 CFR 86.1869-12 contains the AC provisions and 86.1869-12 are the off-cycle C)2 reducing technology credit provisions.

Hope your thanksgiving was good, talk with you soon.

https://www.gpo.gov/fdsys/pkg/FR-2012-10-15/pdf/2012-21972.pdf

https://nepis.epa.gov/Exe/ZyPDF.cgi/P100EZ7C.PDF?Dockey=P100EZ7C.PDF

David

From: Magnall, Deena EOP/USTR [mailto: Ex. 6 - Personal Privacy]
Sent: Wednesday, November 22, 2017 12:33 PM
To: Dickinson, David <Dickinson.David@epa.gov>
Cc: Trick, Bryant P. EOP/USTR <[Ex. 6 - Personal Privacy]; Olechiw, Michael <olechiw.michael@epa.gov>
Subject: RE: Follow Up Info re USTR talks with S Korea re various emission standards, etc

Hi David,

Looks like Emb Seoul managed to track down English versions from the KAIDA website for two of the regs. I've asked if they would be able to provide a translation for the third one, so I'll let you know what I hear back.

Happy Thanksgiving.

Thanks,
Deena

From: Dickinson, David [mailto:Dickinson.David@epa.gov]
Sent: Thursday, November 16, 2017 1:06 PM
To: Magnall, Deena EOP/UST[Ex. 6 - Personal Privacy]
Cc: Trick, Bryant P. EOP/USTR [Ex. 6 - Personal Privacy]; Olechiw, Michael <olechiw.michael@epa.gov>
Subject: RE: Follow Up Info re USTR talks with S Korea re various emission standards, etc

Hi Deena –

I look forward to seeing the information the Koreans sent, once it is translated.

With regard to on-highway recreational vehicles (sometimes known as motorhomes – RVs), the certifying manufacturer sells a bare chassis or cab chassis to an RV buillder. This is known as an incomplete vehicle or incomplete chassis.

40 CFR Part 1036 and Part 1037 governs requirements for heavy-duty engines and heavy-duty vehicles. A vehicle under 1037 must use a certified engine from 1036, again the applicable standards are the heavy-duty engine standards as set forth in40 CFR Part 86. For example, 40 CFR 86.1948-01 prescibes the requirements for incomplete heavy-duty vehicles.

Depending upon the completed weight of the heavy-duty vehicle it would be subject to differing emission levels (e.g. HD 2b/3 requirements, etc).
>https://www.dieselnet.com/standards/us/hd.php<

1036.1 Does this part apply for my engines?

(a) Except as specified in §1036.5, the provisions of this part apply for engines that will be installed in heavy-duty vehicles (including glider vehicles) above 14,000 pounds GVWR for propulsion. These provisions also apply for engines that will be installed in incomplete heavy-duty vehicles at or below 14,000 pounds GVWR unless the engine is installed in a vehicle that is covered by a certificate of conformity under 40 CFR part 86, subpart S.

(b) This part does not apply with respect to exhaust emission standards for HC, CO, NO_x, or PM except as follows:

(1) The provisions of §1036.601 apply.

(2) 40 CFR parts 85 and/or 86 may specify that certain provisions apply.

(c) The provisions of this part also apply for fuel conversions of all engines described in paragraph (a) of this section as described in 40 CFR 85.502.

(d) Gas turbine heavy-duty engines and other heavy-duty engines not meeting the definition *compression-ignition* or *spark-ignition* are deemed to be compression-ignition engines for purposes of this part

I should be able to get you something re the US06 ve Euro 6 issue tomorrow or early next week,

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(b) To be included in the same durability group, vehicles must be identical in all the respects listed in paragraphs (b) (1) through (7) of this section:

(1) Combustion cycle (e.g., two stroke, four stroke, Otto cycle, diesel cycle).

(2) Engine type (e.g., piston, rotary, turbine, air cooled versus water cooled).

(3) Fuel used (e.g., gasoline, diesel, methanol, ethanol, CNG, LPG, flexible fuels).

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(5) Catalyst construction (for example, beads or monolith).

(6) Precious metal composition of the catalyst by the type of principal active material(s) used (e.g., platinum based oxidation catalyst, palladium based oxidation catalyst, platinum and rhodium three-way catalyst, palladium and rhodium three way catalyst, platinum and palladium and rhodium three way catalyst).

(7) The manufacturer must choose one of the following two criteria:

(i) Grouping statistic:

(A) Vehicles are grouped based upon the value of the grouping statistic determined using the following equation:

GS = [(Cat Vol)/(Disp)] × Loading Rate
Where:
GS = Grouping Statistic used to evaluate the range of precious metal loading rates and relative sizing of the catalysts compared to the engine displacement that are allowable within a durability group. The grouping statistic shall be rounded to a tenth of a gram/liter.
Cat Vol = Total volume of the catalyst(s) in liters.
Disp = Displacement of the engine in liters.
Loading rate = The mass of total precious metal(s) in the catalyst (or the total mass of all precious metal(s) of all the catalysts if the vehicle is equipped with multiple catalysts) in grams divided by the total volume of the catalyst(s) in liters.

(B) Engine-emission control system combinations which have a grouping statistic which is either less than 25 percent of the largest grouping statistic value, or less than 0.2 g/liter (whichever allows the greater coverage of the durability group) shall be grouped into the same durability group.

(ii) The manufacturer may elect to use another procedure which results in at least as many durability groups as required using criteria in paragraph (b)(7)(i) of this section providing that only vehicles with similar emission deterioration or durability are combined into a single durability group.

(c) Where vehicles are of a type which cannot be divided into durability groups based on the criteria listed above (such as non-catalyst control system approaches), the Administrator will establish durability groups for those vehicles based upon the features most related to their exhaust emission deterioration characteristics.

(d) Manufacturers may further divide groups determined under paragraph (b) of this section provided the Administrator is notified of any such changes prior to or concurrently with the submission of the application for certification (preferably at an annual preview meeting scheduled before the manufacturer begins certification activities for the model year).

(e) Manufacturers may request the Administrator's approval to combine vehicles into a single durability group which would normally not be eligible to be in a single durability group. The petition should provide:

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§ 86.1827-01 Test group determination.

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(1) Durability group;

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(3) Number of cylinders or combustion chambers;

(4) Arrangement of cylinders or combustion chambers (e.g. in-line, v-shaped);

(5) Subject to the same emission standards (except for CO2), or FEL in the case of cold temperature NMHC standards, except that a manufacturer may request to group vehicles into the same test group as vehicles subject to more stringent standards, so long as all the vehicles within the test group are certified to the most stringent standards applicable to any vehicle within that test group. Light-duty trucks and light-duty vehicles may be included in the same test group if all vehicles in the test group are subject to the same emission standards, with the exception of the CO2 standard and/or the total HC standard.

(b) Where vehicles are of a type which cannot be divided into test groups based on the criteria listed above (such as non-cylinder engines), the Administrator will establish test groups for those vehicles based upon the features most related to their exhaust emission characteristics.

(c) Manufacturers may further divide groups determined under paragraph (a) of this section providing the Administrator is notified in advance of any such changes in writing.

(d) Manufacturers may request the Administrator's approval to combine vehicles into a single test group which would normally not be eligible to be in a single test group. The petition should provide:

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(3) Evidence that the groups will result in sufficient in-use verification program data, appropriate tracking in use, and clear liability for the Agency's recall program; and

(4) A statement that all vehicles within a test group are certified to the most stringent standards applicable to any vehicle within that test group.

(e) Unless otherwise approved by the Administrator, a manufacturer of hybrid electric vehicles must create separate test groups based on both the type of battery technology employed by the HEV and upon features most related to their exhaust emission characteristics.

(f) Unless otherwise approved by the Administrator, a manufacturer of electric vehicles must create separate test groups based on the type of battery technology, the capacity and voltage of the battery, and the type and size of the electric motor.

[64 FR 23925, May 4, 1999, as amended at 65 FR 6864, Feb. 10, 2000; 65 FR 59974, Oct. 6, 2000; 72 FR 8566, Feb. 26, 2007; 75 FR 25689, May 7, 2010]

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Guideline for the approval of greenhouse gas emission reduction and fuel economy improvement of motor vehicles achieved by eco-innovation technology (MOE Notification No 567, 2015.12.30)

Article 1 (Purpose) The purpose of this guideline is to specify details such as the scope, criteria, and the approval application procedure and designation of the technology which attributes to greenhouse gas(CO2) emission reduction and fuel economy(FE) improvement pursuant to Article 9, Clause 3(hereinafter, eco-innovation technology) of the "Regulations for motor vehicle average fuel economy standards, greenhouse gas emission standards, and their application and management" (hereinafter, "Fuel economy, greenhouse gas regulation").

Article 2 (Definition)

① "Eco-innovation technology" shall mean the technology which attributes to CO2 reduction or FE improvement, which is not measurable by the measurement method (hereinafter, "Measurement method according to Fuel economy, greenhouse gas regulation") according to Article 7, clause 1 of "Fuel economy, greenhouse gas regulation"

② "Deterioration" shall mean the deteriorated degree of the reduced CO2 emission or the improved FE during the period of warranty, if eco-innovation technology applied, and a coefficient to represent how deteriorated is "Deterioration Factor".

③ "Usage Frequency" shall mean, in the normal driving condition, the frequency of using the technology which is not constantly used by drivers and a coefficient to represent how frequent is "Usage frequency Factor".

Article 3 (Eligibility criteria of Eco-innovation technology)

A technology that satisfies all of the following item shall be approved as eco-innovation technology:

1. The technology shall be related to the performance or safety of vehicles.
2. Greenhouse gas emission reduction or fuel economy improvement achieved by the technology shall not be measurable by the measurement method specified in "Fuel economy, greenhouse gas regulation".
3. Possible to explain the driver's affect and the technology, and if drivers are not required to use the technology constantly, such shall be applied by determining the usage factor.

Article 4 (Approval procedure of Eco-innovation technology)

① A manufacturer which manufactures (including import, same hereinafter) the vehicles fitted with eco-innovation technology pursuant to Article 3 and intends to be approved (hereinafter, Applicant manufacturer) shall submit the approval application for eco-innovation technology of Attachment 1 with the required documents in each items of Table 1. The chief of NIER shall notify the non-conforming to the applicant

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manufacturer within 20days, if the technology does not satisfy the eligibility criteria of Article 3.

② The minister of MOE may request the technical assessment for the approval application for a technology to the chief of NIER. Within 60 days, the chief of NIER shall organize the technology committee to assess eco-innovation technology, and assess whether the technology can be approved as eco-innovation or not, provided that the period may be extended by 30 days if necessary.

③ The chief of NIER shall submit the approval report for the technology to the minister of MOE in writing, based on the assessment result of technology committee.

④ The minster of MOE shall, based on the approval report for technology, determine whether or not to be approved, in consultation with the minister of MOTIE. The minister of MOE shall issue 'Approval certificate for eco-innovation technology' in Attachment 2, including reduced CO2 emission or improved FE (hereinafter, "Certified credits"), and disclose the approval certificate of eco-innovation technology. However the part which needs to be protected, in terms of intellectual property, may be excluded from the disclosure, at the request of the applicant manufacturer.

⑤ If the certified credits are changed by the significant modification of applicable model (the modification of parts to affect greenhouse gas emission or fuel economy), the applicant manufacturer shall re-apply for the approval of eco-innovation technology.

Article 5 (Assessment of reduced CO2 emission or improved FE)

① The reduced CO2 emission or improved FE achieved by eco-innovation technology shall be calculated according to Table 2. The combined mode according to 'Fuel economy, greenhouse gas regulation' shall apply to the test mode of eco-innovation technology measurement. However, the reduced CO2 emission or improved FE, if allowed by technology committee, may be calculated by a theoretical formula or be measured by the different mode from the combined mode of 'Fuel economy, greenhouse gas regulations'.

② The minimum unit of reduced CO2 emission shall be 0.1g/km and the overall standard deviation of reduced CO2 which is measured repeatedly 5 times or more shall not exceed 0.5g/km. In the case of fuel economy, the minimum unit and the standard deviation of CO2 shall be satisfied as well.

③ The list of eco-innovation technology and the method for calculating the reduced CO2 emission are specified in Table 3. The vehicle manufacturer willing to receive more CO2 emission reduction than the reduction listed in Table 3, shall calculate the reduction amount under Clause 1 and 2.

④ The annual total amount of CO2 reduction based on application of eco-innovation technology shall be calculated as Item 1 and it may be converted into the total amount of fuel economy improvement as Item 2.

1. Total amount of CO2 emission reduction = Σ(Amount of CO2 emission reduction per unit of technology x Sales volume of vehicle with the application of technology)

2. Total amount of fuel economy improvement

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a. PC and buses with seating capacity of 10 persons or less = Total amount of CO2 emission reduction x 24.3 ÷ 97

b. Buses with seating capacity of 11 persons or more and 15 persons or less and trucks = Total amount of CO2 emission reduction x 15.6 ÷ 166

Article 6 (Certification method of reduced CO2 emission or improved FE)

① The certified credits shall be calculated by a vehicle model, if the applicant technology is applied to several vehicle models and the reduced CO2 emission and improved FE are different by vehicle models.

② The applicant manufacturer shall suggest the reasonable UF and DF, in the case that UF needs to be set out for the applicant technology, or its performance is deteriorated, when used during the period of warranty.

③ The applicant manufacturer shall submit the reduced CO2 emission or improved FE by the each technology considering the mutual interference between technologies, if two or more technologies are applied.

④ The applicable technology shall apply limited to the scope of model family, provided the technology committee shall review whether or not a vehicle falls into the model family if several models are classified with one family.

⑤ The eco-innovation technology and its credits shall be valid, provided that there shall exist no modification of applicant models (Weight, Output and Where it is approved as no modification of reduced greenhouse gas emission or improved fuel economy) while being constantly manufactured. However, every 3 years the applicant manufacturer shall submit the information of technical modification to the minister of MOE and the minister shall determine whether the certification is extended or needs to be re-verified.

Article 7 (Eco-innovation technology committee)

① The technology committee pursuant to Article 4, Clause 2 shall consist of within 10 committee members including the chairman. The committee shall consist of internal members recommended by the minister of MOE and MKE as well as experts from the academic and industrial circles. The chief of the Transportation Pollution Research Center shall serve as chairman.

② The technology committee shall assess and review the eligibility of technology, the appropriateness of test measurement and matters pursuant to Article 6, Clause 1 thru 4 and matters on amending the list of eco-innovation technology in Table 3.

③ The president of NIER may skip the assessment and review of the technology committee where a vehicle manufacturer is to have an eco-innovation technology listed in Table 3 accredited.

Article 8 (Assessment of eco-innovation validity)

The minister of MOE may check and assess the certified credits of eco-innovation

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technology, the variation of DF and UF and whether valid or not (hereinafter, "validity evaluation"). The applicant manufacture shall submit the information necessary for validity evaluation, at the request of the minister of MOE.

Article 9 (Disregard of certified credits)
The minister of MOE may cancel the eco-innovation technology approval for the applicable models, if vehicles are manufactured inconsistent with the approval certificate of eco-innovation technology as the result of validity evaluation. From the date of cancellation, certified credits shall be disregarded.

Addendum <2012-469, 2012.09.14>
This guideline shall be enforced from the date of promulgation.

Addendum <567, 2015.12.30>
Article 1(Date of enforcement) This regulation shall be enforced from the date of promulgation.
Article 2 (Retroactive application) The reduced CO2 emission, for which a vehicle manufacturer is accredited, may be retroactively applied from the application date of subject technology. However, the reduced CO2 emission accredited according to Table 3 till 2016.12.31 may be retroactively applied to the vehicles delivered from 2016.1.1.

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[Table 1] Items to be included in the approval application of eco-innovation technology

1. Detailed explanation on the applied technology (parts manufacturer, specification, construction, principal, drawing and reduction effect etc.)
2. Explanation data to satisfy the eligibility criteria of Article 3
3. Detailed explanation on the evaluation method of reduced amount
4. Calculation method of DF,UF (if applied)
5. Applied vehicle model
 - Vehicle name, vehicle type, engine type, vehicle class, fuel, manufacturer, displacement, max output, transmission, gross vehicle weight, curb weight and the method of checking the applied vehicle models and its sales volume.
6. Test report
 - In-house test report (limited to the case where the ministry of MOE and MOTIE approve their facilities and staffs) for the items relevant with the applied technology among followings, including the test report measured by the test agency pursuant to Article 2, Clause 2 of 'Greenhouse gas and fuel economy regulation', provided the calculation value or general data (public accessible) may replace the test report, if an item's appropriateness is approved.
 • Engine(type, displacement, number of cylinders, number of strokes, idle speed, maximum speed, moment of inertia, thermal capacity, full-load performance), coolant temperature rise after engine start, greenhouse gas emission engine map, fuel consumption engine map, fuel density, generator efficiency map, transmission(type, number of gears, gear ratio), transmission efficiency map, axle (gear ratio, efficiency), curb weight, driving resistance variables, frontal area, drag coefficient, clutch (maximum transfer torque), wheels (moment of inertia, radius of dynamic gyration), generator (moment of inertia, rated voltage, maximum current, efficiency curve, voltage during idling, torque loss), battery (rated voltage, charging capacity, voltage during idling, internal resistance), assessment result of reduced amount, etc.

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[Table 2] Calculation method for reduced CO2 or improved FE

1. Reduced CO2 emission (g/km)

$$C_{greenhouse\ gas}=((B_{MC}-E_{MC})-(B_{TA}-E_{TA}))\cdot UF$$

$C_{greenhouse\ gas}$: Reduced greenhouse gas emission [g/km]
B_{MC}: CO2 emission measured with modified test mode before fitting eco-innovation technology [g/km]
E_{MC}: CO2 emission measured with modified test mode after fitting eco-innovation technology [g/km]
B_{TA}: CO2 emission measured with the test mode specified in 'Fuel economy, greenhouse gas regulation' before fitting eco-innovation technology [g/km]
E_{TA}: CO2 emission measured with the test mode specified in 'Fuel economy, greenhouse gas regulation' after fitting eco-innovation technology [g/km]
UF: Usage factor
(B_{MC} – E_{MC}): Difference of reduced CO2 emission measured with modified test mode
(B_{TA} – E_{TA}): Difference of reduced CO2 emission measured with the test mode specified in "Fuel economy, greenhouse gas regulation'.

2. Improved fuel economy (km/l)

$$C_{FC}=((E_{MC}-B_{MC})-(E_{TA}-B_{TA}))\cdot UF$$

C_{FC}: Improved FE [km/l]
B_{MC}: FE measured with modified test mode before fitting eco-innovation technology [km/l]
E_{MC}: FE measured with modified test mode after fitting eco-innovation technology [km/l]
B_{TA}: FE measured with the test mode specified in 'Fuel economy, greenhouse gas regulation' before fitting eco-innovation technology [km/l]
E_{TA}: FE measured with the test mode specified in 'Fuel economy, greenhouse gas regulation' after fitting eco-innovation technology [km/l]
UF: Usage factor
(B_{MC} – E_{MC}): Difference of improved FE measured with modified test mode
(B_{TA} – E_{TA}): Difference of improved FE measured with the test mode specified in "Fuel economy, greenhouse gas regulation'.

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[Table 3] The list of eco-innovation technology and calculation of its credit

1. Overview
This regulation shall apply to the vehicle delivered from 2016.1.1.

2. The list of eco-innovation technology and calculation of its credit

A. Technology for reducing leakage of air conditioning refrigerant.

(1) If HFC-134a, HFO-1234yf refrigerant applied, the rate of refrigerant leakage from an air conditioning system shall be calculated in 0.1 grams according to the procedures specified in SAE J2727. In doing so, the refrigerant permeation rates for hoses shall be determined using the procedures specified in SAE J2064. Manufacturers, if applying other refrigerants, should be approved by the Minister of MOE regarding procedures for other refrigerants.

(2) The CO2 credit (g/km) for reducing leakage of air conditioning refrigerant shall be calculated as below. HileakDis in the following formula shall apply from the vehicles delivered from 2017.1.1.

(a) PC and buses with seating capacity of 10 persons or less

$$Leakage\,Credit = Max\,Credit \times \left[1 - \left(\frac{LeakScore}{16.6}\right) \times \left(\frac{GWP_{REF}}{1430}\right)\right] - HiLeakDis$$

Where,

- Max Credit is 7.0 for air conditioning systems using HFC-134a, and 7.9 for air conditioning systems using a refrigerant with a lower global warming potential.
- Leak Score means the refrigerant leakage rate determined according to the paragraph (1). If the calculated rate is less than 8.3, the rate shall be 8.3 or shall be 4.1 for systems using electric compressors.
- GWP_{REF} means the global warming potential of the refrigerant
- $$HiLeakDis = 1.1 \times \left(\frac{LeakScore - LeakThreshold}{3.3}\right)$$

* If GWP_{REF} is greater than 150 or if the calculated result of the equation is less than zero, HiLeakDis shall be set to zero, or if the calculated result of the equation is greater than 1.1, HiLeakDis shall be set to 1.1.

- LeakThreshold = 11.0 for air conditioning systems with a refrigerant capacity less than or equal to 733 grams; or 1.5 percent of Refrigerant Capacity for air conditioning systems with a refrigerant capacity greater than 733 grams,

(b) Buses with seating capacity of 11 persons or more and 15 persons or less and trucks

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$$Leakage\ Credit = Max\ Credit \times \left[1 - \left(\frac{LeakScore}{20.7}\right) \times \left(\frac{GWP_{REF}}{1430}\right)\right] - HiLeakDis$$

Where,

- Max Credit is 8.6 for air conditioning systems using HFC-134a, and 9.9 for air conditioning systems using a refrigerant with a lower global warming potential.
- LeakScore means the refrigerant leakage rate determined according to the paragraph (1). If the calculated rate is less than 10.4, the rate shall be 10.4. or shall be 5.2 for systems using electric compressors.
- GWP_{REF} means the global warming potential of the refrigerant
- $$HiLeakDis = 1.3 \times \left(\frac{LeakScore - LeakThreshold}{3.3}\right)$$

  * If GWP_{REF} is greater than 150 or if the calculated result of the equation is less than zero, HiLeakDis shall be set equal to zero, or if the calculated result of the equation is greater than 1.3, HiLeakDis shall be set to 1.3
- LeakThreshold = 11.0 for air conditioning systems with a refrigerant capacity less than or equal to 733 grams; or 1.5% of Refrigerant Capacity for air conditioning systems with a refrigerant capacity greater than 733 grams,

(3) The following values for refrigerant global warming potential (GWPREF) shall be used in the calculations of the paragraph (2).

(a) HFC-134a: 1430

(b) HFC-152a: 124

(c) HFO-1234yf: 4

(d) CO2: 1

B. Technology for improving the efficiency of air conditioning systems

(1) The class of technology for improving the efficiency of air conditioning system and its credit(g/km) is as below.

Improved air conditioning technology	PC and buses with seating capacity of 10 persons or less	Buses with seating capacity of 11 persons or more and 15 persons or less and trucks
Reduced reheat, with externally-controlled, variable-displacement compressor	0.9	1.4

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Reduced reheat, with externally-controlled, fixed-displacement or pneumatic variable displacement compressor	0.6	0.9
Default to recirculated air with closed-loop control of the air supply (sensor feedback to control interior air quality) whenever the ambient temperature is 24°C or higher with closed-loop control of the air supply	0.9	1.4
Default to recirculated air with open-loop control air supply (without sensor feedback to control interior air quality) whenever the ambient temperature is 24°C or higher with open-loop control of the air supply	0.6	0.9
Blower motor controls which reduce wasted electrical energy	0.5	0.7
Internal heat exchanger	0.6	0.9
Improved condensers and/or evaporators of performance improvement for the system of greater than 10% when compared to previous industry standard designs	0.6	0.9
Oil separator.	0.3	0.4

(2) For each air conditioning system that applies simultaneously two or more of the items listed in the above Table, the total credit value is the sum of CO2 credit for each item that applies to the air conditioning system. But the max credit shall not exceed the following values
  (a) PC and buses with seating capacity of 10 persons or less: 3.1g/km
  (b) Buses with seating capacity of 11 persons or more and 15 persons or less and trucks: 4.5g/km

(3) The technology listed in the above table shall meet the following requirements.
  (a) Reduced reheat, with externally-controlled, variable-displacement compressor
    1) Compressor displacement shall be controlled via an electronic signal, using sensor signal.
    2) Sensor signal shall include position or setpoint of interior temperature control, interior temperature, evaporator outlet air temperature, or refrigerant temperature.
    3) Air temperature at the outlet of the evaporator can be controlled to a level at 5°C, or higher.
  (b) Reduced reheat, with externally-controlled, fixed-displacement or pneumatic variable displacement compressor
    1) The output of either compressor shall be controlled by cycling the compressor clutch off-and-on via an electronic signal, using sensor signals.

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2) Sensor signal shall include position or setpoint of interior temperature control, interior temperature, evaporator outlet air temperature, or refrigerant temperature.
3) Air temperature at the outlet of the evaporator can be controlled to a level at 5°C, or higher.

(c) Default to recirculated air
1) It means that the default position of the mechanism which controls the source of air supplied to the air conditioning system shall change from outside air to recirculated air when the operator or the automatic climate control system has engaged the air conditioning system,
2) except under those conditions where dehumidification is required for visibility
3) In vehicles equipped with interior air quality sensors (e.g., humidity sensor, or carbon dioxide sensor), the controls may determine proper blend of air supply sources to maintain freshness of the cabin air and prevent fogging of windows while continuing to maximize the use of recirculated air.
4) The vehicle operator may manually select the non-recirculated air setting during vehicle operation but the system must default to recirculated air mode on subsequent vehicle operations (i.e., next vehicle start).
5) The climate control system may delay switching to recirculation mode until the interior air temperature is less than the outside air temperature, at which time the system must switch to recirculated air mode.
6) Notwithstanding paragraph 5) if a vehicle manufacturer files to the Minister of MOE the analysis data which are technically feasible, a separate ambient temperature may be set for a default to recirculated air mode.

(d) Blower motor controls which reduce wasted electrical energy
1) For controlling fan and blower speeds, it shall not use resistive elements to decrease the voltage supplied to the motor.

(e) Internal heat exchanger
1) It shall transfer heat from the high-pressure, liquid-phase refrigerant entering the evaporator to the low-pressure, gas-phase refrigerant exiting the evaporator

(f) Improved condensers and/or evaporators
1) The vehicle manufacturer shall prove that the coefficient of performance (COP) of air conditioning system using improved evaporator and condenser designs is 10 percent higher, when compared to an existing system using standard component design, through system analysis of components.
2) The standard component design specified in 1) shall be subjected to the test procedures of SAE J2765 for a unit component.
3) The manufacturer must submit to the Minister of MOE an engineering analysis demonstrating the increased improvement of the system relative to

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the baseline design, where the baseline component(s) for comparison is the version which a manufacturer most recently had in production on the same vehicle design or in a similar or related vehicle model.

4) It shall be proved that the dimensional characteristics (e.g., tube configuration/thickness/spacing, and fin density) of the baseline component(s) be compared to the new component(s) to demonstrate the improvement in coefficient of performance.

(g) Oil separator

1) It shall remove at least 50 percent of the oil entrained in the oil/refrigerant mixture exiting the compressor and return it to the compressor housing or compressor inlet, or a compressor design which does not rely on the circulation of an oil/refrigerant mixture for lubrication shall be applied.

2) The manufacturer must submit to the Minister of MOE an engineering analysis demonstrating the increased improvement of the system relative to the baseline design, where the baseline component(s) for comparison is the version which a manufacturer most recently had in production on the same vehicle design or in a similar or related vehicle model.

3) It shall be proved that the characteristics of the baseline component(s) be compared to the new component(s) to demonstrate the improvement in coefficient of performance.

(4) The vehicle manufacturer willing to have the CO2 credit for improving the efficiency of air conditioning systems accredited, shall verify the effect of CO2 reduction according to the procedures specified in paragraph 3 and, if necessary, adjust the CO2 credit.

C. Waste heat recovery

(1) Waste heat recovery means a system that captures heat that would otherwise be lost through the engine, exhaust system, or the radiator or other sources and converting that heat to electrical energy that is used to meet the electrical requirements of the vehicle or used to augment the warming of other load reduction technologies (e.g., cabin warming, active engine or transmission warm-up technologies). The amount of energy recovered is the average value over 5-cycle testing.

(2) CO2 credit shall be calculated according to the following formula

$$Credit = ELR \times 0.004$$

Where:

ELR = the electrical load reduction of the waste heat recovery system (Watts) and it is calculated as the average of 5-cycle test results.

D. High efficiency exterior lights.

(1) It means a lighting technology that, when installed on the vehicle, is expected to

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reduce the total electrical demand of the exterior lighting system when compared to conventional lighting systems

(2) Credits for high efficiency lighting are the sum of the credits for the applicable lighting locations in the following table or, if all lighting locations in the table are equipped with high efficiency lighting, the total credit for high efficiency lighting shall not exceed 0.6g/km. Lighting components that result in credit levels less than those shown in the following table are not eligible for credits.

Lighting Component	Credit (g/km)
Low beam	0.24
High beam	0.03
Parking/position	0.06
Turn signal, front	0.04
Side marker, front	0.04
Tail	0.06
Turn signal, rear	0.04
Side marker, rear	0.04
License plate	0.05

E. Solar panels

(1) The external installation of horizontally-oriented solar panels shall be direct and unimpeded solar exposure to an overhead sun. On an electric vehicle, a plug-in hybrid electric vehicle, a fuel cell vehicle, or a hybrid electric vehicle the solar energy shall be used to provide energy to the electric drive system of the vehicle by charging the battery or directly providing power to the electric motor or to essential vehicle systems (e.g., cabin heating or cooling/ventilation). If solar panels applied to internal combustion engines, the separate battery shall be equipped which can save the electric energy generated from using solar panel. The rated power of the solar panels used to determine the credit value must be determined under the standard test conditions of 1,000 W/m^2 direct solar irradiance at a panel temperature of 25 ±2 °C with an air mass of 1.5 spectrum (AM1.5).

(2) CO2 credit shall be calculated as follows.

(a) Solar panels used solely for charging the battery of a vehicle

$$Credit = 0.02431 \times P_{panel}$$

(b) Solar panels used both for active cabin ventilation and for charging the battery of

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a vehicle

$$Credit = C_{vent} + 0.02431 \times (P_{panel} - P_{vent})$$

Where,

P_{panel} is the is the rated power of the solar panel, in Watts

C_{vent} is the CO2 credit attributable to active cabin ventilation (g/km)

P_{vent} is the amount of power, in Watts, required to run the active cabin ventilation system.

F. Active aerodynamic improvements

(1) It means technologies that are automatically activated under certain conditions to improve aerodynamic efficiency while preserving other vehicle attributes or functions.

(2) CO2 credit shall be calculated as follows.

(a) PC and buses with seating capacity of 10 persons or less:

$$Credit = 12.03 \times CD_{reduced}$$

(b) Buses with seating capacity of 11 persons or more and 15 persons or less and trucks:

$$Credit = 20.61 \times CD_{reduced}$$

Where,

$CD_{reduced}$ is the percent reduction in the coefficient of drag (Cd) and it shall be determined in consistent with standard industry test methods and practices (SAE J2881).

G. Engine idle start-stop

(1) It means a technology which enables a vehicle to automatically turn off the engine when the vehicle comes to a rest and restarts the engine when the driver applies pressure to the accelerator, or controls the brake or clutch pedals. Where engine start-stop is the predominant operating mode for the vehicle, CO2 credit is accredited.

(2) Main driving mode means a single driving mode which is always selected for next driving regardless with the previous driving mode which was selected. The set of main driving mode shall not be changed arbitrarily and the main driving mode can be converted to other mode only with the intentional switch of a driver.

(3) CO2 credit shall be calculated as follows.

(a) PC and buses with seating capacity of 10 persons or less: if equipped with an electric heater circulation system (or a technology that provides a similar function): 2.3 g/km, For vehicles not equipped with such systems the credit is 1.6 g/km

(b) Buses with seating capacity of 11 persons or more and 15 persons or less and trucks: if equipped with an electric heater circulation system (or a technology that provides a similar function): 4.0 g/km, For vehicles not equipped with such systems the credit is 3.1 g/km

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(c) The electric heater circulation system pursuant to paragraph (a) and (b) or a similar system must keep the engine off for a minimum of one minute when the external ambient temperature is 0 °C and when cabin heating is operated.

H. Active transmission warm-up

(1) It means a system that uses waste heat from the vehicle to quickly warm the transmission fluid to an operating temperature range using a heat exchanger, increasing the overall transmission efficiency by reducing parasitic losses associated with the transmission fluid, such as losses related to friction and fluid viscosity.

(2) CO2 credit shall be calculated as follows.

(a) PC and buses with seating capacity of 10 persons or less: 0.9g/km

(b) Buses with seating capacity of 11 persons or more and 15 persons or less and trucks: 2.0g/km

I. Active engine warmup

(1) It means a system that uses waste heat from the vehicle to warm up targeted parts of the engine so that it reduces engine friction losses and enables the closed-loop fuel control more quickly. It allows a faster transition from cold operation to warm operation, decreasing CO2 emissions, and increasing fuel economy.

(2) CO2 credit shall be calculated as follows.

(a) PC and buses with seating capacity of 10 persons or less: 0.9g/km

(b) Buses with seating capacity of 11 persons or more and 15 persons or less and trucks: 2.0g/km

J. Thermal control technologies

If the thermal control technologies below applied, the maximum credit shall not exceed 1.9g/km for PC and buses with seating capacity of 10 persons or less and 2.7g/km for Buses with seating capacity of 11 persons or more and 15 persons or less and trucks.

(1) Glass or glazing

(a) It means the technology to prevent the temperature increase inside the vehicle by decreasing the solar energy penetrated into the vehicle.

(b) CO2 credit shall be calculated as follows.

1)

$$Credit = \left[Z \times \sum_{i=1}^{n} \frac{T_i \times G_i}{G} \right] / 1.609$$

Where,

Z = 0.3 (PC and buses with seating capacity of 10 persons or less) and 0.4 (Buses with seating capacity of 11 persons or more and 15 persons or less and trucks);

G_i = the measured glass area of window i, (m^2)

G = the total glass area of the vehicle, (m^2)

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T_i = the estimated temperature reduction for the glass area of window i, determined using the following formula:

$T_i = 0.3987 \times (T_{tsbase} - T_{tsnew})$

T_{tsnew} = the total solar transmittance of the glass, measured according to ISO 13837,

T_{tsbase} = 62 for the windshield, side-front, side-rear, rear-quarter, and backlite locations, and 40 for rooflite locations.

2) CO2 credit for PC and buses with seating capacity of 10 persons or less shall not exceed 1.8g/km and CO2 for buses with seating capacity of 11 persons or more and 15 persons or less and trucks shall not exceed 2.4 g/km.

(2) Active seat ventilation

(a) It means a device which transfers heat from the seating surface which is in contact with the seat occupant and exhausts it to a location away from the seat. At a minimum, the driver and front passenger seat must utilize this technology for a vehicle to be eligible for credit.

(b) CO2 credit shall be calculated as follows.

1) PC and buses with seating capacity of 10 persons or less: 0.6g/km

2) Buses with seating capacity of 11 persons or more and 15 persons or less and trucks: 0.8g/km

(3) Solar reflective surface coating

(a) It means a vehicle paint or other surface coating which reflects at least 65 percent of the impinging infrared solar energy, as determined using one of ASTM standards E903, E1918-06, and C1549-09. The coating must be applied at a minimum to all of the approximately horizontal surfaces of the vehicle that border the passenger and luggage compartments of the vehicle.

(b) CO2 credit shall be calculated as follows.

1) PC and buses with seating capacity of 10 persons or less: 0.2g/km

2) Buses with seating capacity of 11 persons or more and 15 persons or less and trucks: 0.3g/km

(4) Passive cabin ventilation

(a) It means ducts or methods which utilize convective airflow to move heated air from the cabin interior to the exterior of the vehicle.

(b) CO2 credit shall be calculated as follows.

1) PC and buses with seating capacity of 10 persons or less: 1.1g/km

2) Buses with seating capacity of 11 persons or more and 15 persons or less and trucks: 1.4g/km

(5) Active cabin ventilation

(a) It means devices which mechanically move heated air from the cabin interior to the exterior of the vehicle.

(b) CO2 credit shall be calculated as follows.

1) PC and buses with seating capacity of 10 persons or less: 1.3g/km

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2) Buses with seating capacity of 11 persons or more and 15 persons or less and trucks: 1.7g/km

K. Efficient generation alternator

(1) It means the alternator technology which has the higher electric efficiency than an existing alternator by improving the components and its system of vehicle alternators. The existing efficiency of alternator is set as 65% and the test procedures are subjected to ISO 8854:2012. The reduction of electrical load, which is caused by efficient alternator, is determined by using 5-cycle.

(2) CO2 credit is calculated according to the following formula.

$$Credit = ELR \times 0.004$$

Where, ELR: the electrical load reduction of the efficient alternator (Watts) and it is calculated as the average of 5-cycle test results.

(3) The efficiency of alternators are tested according to the following procedures.

(a) The set-up of the test bench and the testing procedure is to fulfil the precision requirements specified in ISO 8854:2012.

(b) The efficiency is calculated at a speed of 1800/3000/6000/10,000 rpm and at a load of 50 %, and the weight factors shall be 0.25/0.40/0.25/0.1 for each rpm and the weighted average value shall be the final efficiency.

L. Technology for engine compartment encapsulation system

(1) It means an engine compartment encapsulation system which permits the reduction of heat loss after the vehicle is turned off by sealing the engine compartment and by the closing of grille openings by a radiator shutter. The stored heat yields a delayed cool-down of the powertrain. After restarting the fuel consumption of the vehicle is increased and CO2 emissions of the vehicle is decreased due to lower friction caused by the higher powertrain temperature.

(2) CO2 credit is calculated as below.

(a) Determining the cool-down curves

1) The cool-down curves shall be determined experimentally for the baseline and the vehicle equipped with engine compartment encapsulation system. The change of coolant temperatures by means of a thermocouple at a constant ambient temperature of at least 14 °C over 24 hours shall be measured. The preconditioning is performed using UDDS and it may be repeated for heating the engine up to the maximum coolant temperature.

2) After preconditioning, for deactivation of all pumps and fans, the ignition shall be switched off and the dash key pulled out. The car's bonnet shall be closed completely. Any artificial ventilation systems inside the test cell shall be switched off.

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3) The cool-down curves is converged by the mathematical approach described by following formula. The least squares method shall be used for the fitting of the two curves. To do that, the temperature measurement data of the first 20 minutes after engine cut-off is not to be considered because of the untypical behavior of the coolant temperature after switching off the coolant system.

$$T(t) = (T_O - T_A) \cdot e^{(-dt)} + T_A$$

Where,
T(t) : temperature over time (℃)
T_O : temperature of the operating engine (℃)
T_A : ambient temperature (℃)
d : decay constant

(b) Determining the hot start benefit

1) The difference of CO2 emissions between a cold start and a hot start CO2 test mode is calculated as below.

$$HSB = 1 - \frac{CO_2(hot)}{CO_2(14℃)}$$

Where
CO2 (hot): CO2 emissions of hot start CO2 test (g/km)
CO2 (14°C): CO2 emissions of cold start CO2 test (g/km)

2) The coolant temperature at the beginning of the cold start test and the ambient temperature in the test cell shall not exceed 14 °C. The state of charge (SOC) variation of the starter battery after each test shall be within 5 %.

(c) Calculation of CO2 reduction

1) The potential of CO2 reduction is calculated as following formula.

$$\Delta CO_2 = 1443 \ln\left(\frac{e^{-d_B t}+1}{e^{-d_E t}+1}\right) \cdot HSE$$

Where,
d_B: decay constant of vehicle without an engine compartment encapsulation (1/h). This value is calculated according to paragraph (a)
d_E: decay constant of vehicle with an engine compartment encapsulation (1/h). This value is calculated according to paragraph (a)
HSB: Hot Start Benefit: HSB. This value is calculated according to paragrahp (b).

2) Relative CO2 reduction potential ΔCO 2 (t) for different parking times is identified as below table.

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Parking time (h)	0.5	1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5
ΔCO2 (%)												
Parking time (h)	12.5	13.5	14.5	15.5	16.5	17.5	18.5	19.5	20.5	21.5	22.5	23.5
ΔCO2 (%)												

3) The total CO2 credit, weighted by the parking times (pt) shall be calculated using following formula.

$$C_{CO_2} = TA_{CO_2} \cdot \sum_{pt=1}^{24} \Delta CO_2(t)_{pt} \cdot SVS_{pt}$$

Where, TA_{CO2} means CO2 emission value of the eco-innovation vehicle without an engine compartment encapsulation. And the values for parking time [pt] and SVS [%] shall be those in following Table.

Parking time (h)	0.5	1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5
SVS (%)	36	13	6	4	2	2	1	1	3	4	3	1
Parking time (h)	12.5	13.5	14.5	15.5	16.5	17.5	18.5	19.5	20.5	21.5	22.5	23.5
SVS (%)	1	3	3	2	1	1	1	1	1	1	1	1

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3. Test procedures for improving the efficiency of air conditioning systems

A. The vehicle manufacturers shall perform "B. Air Conditioning Idle Test" or "AC17 test" for validating the credits for technology for improving the efficiency of air conditioning system in paragraph 2.B and, if necessary, the credit shall be adjusted.
   (1) For vehicles delivered till 2019.12.31, the Air Conditioning Idle Test shall be performed and, if necessary, the credit is adjusted or AC17 test report shall be submitted.
   (2) For vehicles delivered after 2020.1.1, AC17 test shall be performed with and without the technology for improving the efficiency of air conditioning system and if necessary the credit is adjusted.

B. Air Conditioning Idle Test and AC 17 test is as below.
   (1) Air conditioning system category
      (a) Air conditioning system shall be categorized, if following designs characteristics are different.
         1) Compressors: fixed displacement vs. variable displacement compressors,
         2) Expansion valve: orifice tube vs. thermostatic expansion valve
         3) Evaporator: single vs. dual evaporator
         4) Component designs or types and/or system control strategies
      (b) Air conditioning system designs which have similar cooling capacity, component types, and control strategies, may be considered to be same system designs, even if the following items are different.
         1) compressor pulley ratios
         2) or condenser or evaporator surface areas
      (c) The manufacturer shall also report the following information for each vehicle tested:
         1) The test vehicle name, curb weight, engine displacement, transmission types and gear ratio
         2) Interior volume, climate control system type
         3) Refrigerant type, compressor type, and evaporator/condenser characteristics.
   (2) Air Conditioning Idle Test
      (a) Test vehicle selection
         1) The manufacturer must select the vehicle configuration to be tested that is expected to result in the greatest increased CO2 emissions as a result of the operation of the air conditioning system among the vehicles equipped with the same air conditioning system.
         2) Test vehicle for PC and buses with seating capacity of 10 persons or less and Buses with seating capacity of 11 persons or more and 15 persons or less and trucks shall be selected separately.
      (b) Test cell ambient conditions

1) Ambient humidity within the test cell during all phases of the test sequence shall be controlled to an average of 5.7~8.6 (grains of water / kg of dry air).
2) Ambient air temperature within the test cell during all phases of the test sequence shall be controlled to 23~27 °C on average and 24 ±3 °C as an instantaneous measurement. Air temperature shall be recorded continuously at intervals of not more than 30 seconds.

(c) Test sequence.

1) Test the vehicle in a fully warmed-up condition. If the vehicle has soaked for two hours or less since the last exhaust test element, preconditioning may consist of a 1st section of UDDS, 2nd section of UDDS, US06, or SC03. For soak periods longer than two hours, precondition the vehicle using one full Urban Dynamometer Driving Schedule. Ensure that the vehicle has stabilized at test cell ambient conditions such that the vehicle interior temperature is not substantially different from the external test cell temperature. Windows may be opened during preconditioning to achieve this stabilization.
2) Immediately after the preconditioning, turn off any cooling fans and close all the vehicle's windows. If preconditioning a vehicle with its hood open, close the hood. Ensure that all the vehicle's air conditioning systems are set to full off, start the CO2 sampling system, and then idle the vehicle for not less than 1 minute and not more than 5 minutes to achieve normal and stable idle operation.
3) Measure and record the continuous CO2 concentration for 600 seconds. Measure the CO2 concentration continuously using raw or dilute sampling procedures. Multiply this concentration by the continuous (raw or dilute) flow rate at the emission sampling location to determine the CO2 flow rate. Calculate the CO2 cumulative flow rate continuously over the test interval. Alternatively, CO2 may be measured and recorded using a constant velocity sampling system.
4) Within 60 seconds after completing the measurement described in paragraph 3) of this section, turn on the vehicle's air conditioning system. Set automatic air conditioning systems to a temperature 5 °C below the ambient temperature of the test cell. Set manual air conditioning systems to maximum cooling with recirculation turned off, except that recirculation shall be enabled if the air conditioning system automatically defaults to a recirculation mode when set to maximum cooling. Continue idling the vehicle while measuring and recording the continuous CO2 concentration for 600 seconds. Air conditioning systems with automatic temperature controls are finished with the test after this 600 second idle period.
5) Within 60 seconds after completing the measurement described in paragraph 4) of this section, leave the vehicle's air conditioning system on and set as

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described in paragraph 4) of this section but set the fan speed to the lowest setting that continues to provide air flow. Recirculation shall be turned off except that if the system defaults to a recirculation mode when set to maximum cooling and maintains recirculation with the low fan speed, then recirculation shall continue to be enabled. After the fan speed has been set, continue idling the vehicle while measuring and recording the continuous CO2 concentration for a total of 600 seconds.

(d) Calculations.

1) For the measurement with no air conditioning operation, calculate the CO2 emissions (grams/minute) by dividing the total mass of CO2 by 10.0 (the duration in minutes for which CO2 is measured). Round this result to the nearest tenth of a gram per minute.
2) For the measurement with air conditioning in operation for automatic air conditioning systems, calculate the CO2 emissions (grams/minute) by dividing the total mass of CO2 by 10.0. Round this result to the nearest tenth of a gram per minute.
3) For the measurement with air conditioning in operation for manually controlled air conditioning systems, calculate the CO2 emissions (grams/minute) by summing the total mass of CO2 from paragraphs (c) 4) and 5) of this section and dividing by 20.0. Round this result to the nearest tenth of a gram per minute.
4) Calculate the increased CO2 emissions due to air by subtracting the results with no air conditioning operation from the results in operation for automatic air conditioning.

(e) Adjustment of CO2 reduction

1) The manufacturer may choose one of the following idle test threshold (ITT) values for an air conditioning system:
   a) 14.9 grams per minute
   b) 20.5 - (1.58 x Displacement)
      Where, displacement = the engine displacement of the test vehicle, expressed in liters and rounded to the nearest one tenth of a liter.
2) If the CO2 emissions value determined in (d) is less than or equal to the idle test threshold (ITT) determined in paragraph 1) of this section, the total CO2 efficiency credit value (Credit) shall be the applicable value determined in paragraph 2. B. (1) of this section.
3) If the CO2 emissions value determined in (d) is greater than the idle test threshold (ITT) determined in paragraph 1) of this section, the total CO2 efficiency credit value (Credit) shall be adjusted as follows:

$$Credit = TCV \times \left[1 - \frac{(ITP - ITT)}{6.4}\right]$$

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Where, Credit = The adjusted CO2 credit value

TCV = The total CO2 efficiency credit value determined according to paragraph B. (1) of this section; and

ITP = the increased CO2 emissions determined from the Idle Test Procedure in paragraph (d).

ITT = the idle test threshold determined in paragraph 1) of this section

4) If test results in paragraph (d) exceeds the idle test threshold (ITT) determined in paragraph 1) plus 6.4 grams per minute, the credit shall be 0g/km.
5) In case of air conditioning systems with compressors that are powered by electricity CO2 credit from paragraph (1) of this section shall be applied, as long as the engine remains off for a period of at least 2 minutes during the air conditioning on portion of the Idle Test Procedure in (c).

(3) AC17 test

(a) Test vehicle selection

1) The vehicle manufacturer, willing to receive the CO2 credit for technology for improving the efficiency of air conditioning systems, shall submit the class of air conditioning system by the platform of vehicle. The manufacturer must test at least one unique air conditioning system within each vehicle platform in a model year. For the first model year for which an air conditioning system is expected to generate credits, the manufacturer must select for testing the projected highest-selling configuration among vehicle platform.
2) When all unique air conditioning system designs within a platform have been completed for AC17 test, no additional testing is required within that platform, and credits may be carried over to subsequent model years. However, AC17 test shall be performed if air conditioning system is added or changed.
3) A platform means a vehicle classification as having the identical characteristics for structure (mainly body structure, chassis design) of a vehicle manufacturer. The platform is not classified by the vehicle model name and the rate of accessories, etc. as well as the combination of powertrain, roof line and a number of door, seat and window in general. A vehicle platform may include a multiple Fuel economy grades (including the case being categorized as "PC and buses with seating capacity of 10 persons or less" and "Buses with seating capacity of 11 persons or more and 15 persons or less and trucks").

(b) Test cell.

1) Environmental chamber

a) The chamber shall be sized 6 meters in width, 12 meters in length and 3 meters in height.
b) The ambient temperature and humidity within the chamber shall be controlled and recorded pursuant the provision specified in paragraph (c).

2) Cooling fan
a) Cooling fan shall be variable to vehicle speed.
b) The air flow emitted from cooling fan in the axial direction shall be distributed uniformly.
c) The flow area of air emitted from cooling fan shall not be less than $1.7m^2$
d) Approximately $45m^3/s$ of air flow shall be provided at 96km/h of vehicle speed.
e) If only cooling fan is used for controlling ambient temperature or impossible to control it mechanically, cooling fan speed is allowed up to 6.4 km/h at 0km/h of vehicle speed.
f) If ambient temperature and humidity condition within environmental chamber or test cell is controlled and sufficient air is provided for test vehicles, the cooling fan meeting only the condition of paragraph. a) and b) may be used.

3) Device simulating solar radiant energy
a) Acceptable types of lamp are Metal halide, Sodium iodide and Quartz halogen.
b) The property of spectral distribution shall be as follows.

Band width(nm)	Percent of total spectrum	
	Lower limit (%)	Upper limit (%)
<320		0
320~400	0	7
400~780	45	55
>780	35	53

c) The radiant energy intensity shall be determined as an average of two points measured at centerline of the test vehicle at the base of the windshield and at centerline of the test vehicle at the base of the rear window. The radiant energy intensity set point shall be 850 ±45 W/m^2.
d) Radiant energy uniformity must be checked at least every 500 hours of emitter usage or every six months. The uniformity of radiant energy intensity shall be measured at each point of a 0.5 meter grid over the vehicle's footprint at an elevation of 1 meter above the floor and shall be 722~978W/m^2 in all measuring points.

4) The test cell for CVS-75 may be applied instead of 1) thru 3). In this case,

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the operation of air conditioner shall be set as the condition pursuant to paragraph (e), 2)

(c) Ambient conditions.

1) The ambient temperature during emission sampling shall be kept as 21.0~29.0°C throughout the test and 23.5~28.0°C on average.
2) The ambient temperature target in 1) for both the air conditioning on and off portions of emission sampling shall be met.
3) Control ambient temperature during the preconditioning cycle and 30 minute soak to 25.0 ± 5.0 °C.
4) Target the specified ambient humidity levels shall be set as 50% or 9.86g water/kg, air.
5) The temperature and humidity inside the test cell shall be measured every 30 seconds during emission gas sampling. Test data may be measured from moving-averaging with an interval of 30 seconds, if measuring interval is 12 seconds or less.

(d) Interior air temperature measurement.

1) Measure and record the vehicle's interior air temperature at least once every 5 seconds during the sampling period.
2) Measure temperature at the outlet of the center-most duct on the dashboard, and approximately 30 mm behind the driver's headrest and passenger's headrest.

(e) Air conditioning system settings.

1) For testing pursuant to paragraph (b) 1)~3)

a)For automatic systems, set the temperature control to 22 °C.

b)For manual systems, set the temperature as below.

① Set the temperature to full cold and "maximum", set airflow to "recirculate" and select the highest fan setting.

② During the first idle period of the SC03 driving schedule (between 186 and 204 seconds), reduce the fan speed setting to nominally 50% of maximum fan speed, set airflow to "fresh air", and adjust the temperature setting to target a temperature of 13 °C at the dashboard air outlet. Maintain these settings for the remainder of the test. If the system is unable to meet the 13 °C target, you may instead set airflow to "fresh air" and temperature to full cold.

③ If the vehicle is equipped with technology that defaults to recirculated air at ambient temperatures above 22 °C, that technology should remain enabled throughout the test;

④ Except as specified in paragraph ① thru ③ of this section, use good engineering judgment to apply the settings described after approved by the Minister of MOE.

2) If applying test equipment for CVS-75 mode in paragraph (b) 4), the manufacturer shall set the driving condition as maximum load condition and shall apply it after approved by the Minister of MOE.

(f) Test procedure.

1) Perform an additional UDDS preconditioning cycle that concludes with a 12 to 36 hour soak. You may use a forced cooldown system to bring transmission oil, engine oil, engine coolant, and cabin air temperatures to within soak temperature limits.
2) Open the vehicle's windows and operate the vehicle over a preconditioning UDDS with no solar heating and with the air conditioning off. At the end of the preconditioning drive, turn off the test vehicle and all cooling fans.
3) Turn on solar heating within one minute after turning off the engine. Once the solar energy intensity reaches 805 W/m^2, let the vehicle soak for 30 ± 1 minutes. Close the vehicle's windows at the start of the soak period.
4) Turn the air conditioning control to the "on" position before testing so the air conditioning system is active whenever the engine is running. Place the vehicle in gear 15 seconds after engine starting, which is 3 seconds before the first acceleration. At the end of the driving schedule (SC03), simultaneously switch all the sampling, recording, and integrating from SC03 to HFET. Indicate the end of the SC03 test cycle in the recorded data.
5) Directly following the SC03 driving schedule, operate the vehicle over the HFET driving schedule. Turn the vehicle off at the end of the driving schedule and simultaneously stop all sampling, recording, and integrating. Indicate the end of the test cycle in the recorded data. Turn off the solar heating.
6) Allow the vehicle to remain on the dynamometer for (10 to 15) minutes after emission sampling has concluded. Repeat the testing described in paragraphs 2) thru 5) of this section and turn off the vehicle's air conditioner and the solar heating throughout the test run. The windows may be open or closed.

(g) Calculations.

1) The mass of CO2 emissions shall be measured and reported for each of SC03 and HFET with operation of air conditioner and with no operation of air conditioner.
2) Calculate the composite mass-weighted emissions of CO2 due to the operation of air conditioner, using the following equation.

$$e_{CO2-ACOnComp} = 0.6\left(\frac{m_{SC03}}{D_{SC03}}\right) + 0.6\left(\frac{m_{HFET}}{D_{HFET}}\right)$$

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Where:

mS_{C03} = mass emissions from the SC03 test interval, in grams.
DS_{C03} = measured driving distance during the SC03 test interval, in km.
m_{HFET} = mass emissions from the HFET test interval, in grams.
D_{HFET} = measured driving distance during the HFET test interval, in km.

(h) Adjustment of CO2 credit

1) For vehicles delivered from 2020, the manufacturers must calculate air conditioning credits according to the provisions of this paragraph (a) thru (g) for the vehicles with application of technology for improving air conditioning efficiency and with no application of the technology, if necessary, the CO2 credit shall be adjusted.
2) The manufacturer shall, upon selecting the vehicle with no application of the technology for improving the efficiency of air conditioning system, select the similar vehicle using good engineering judgment. If the manufacturer cannot select the similar vehicle, they may submit to the Minister of MOE an engineering analysis that describes why an appropriate vehicle is not available, and calculate the CO2 credit values from technical analysis and data. And it shall be approved by the Minister of MOE.
3) CO2 credits is adjusted as below by comparing the CO2 emission between the application of technology for improving the efficiency of air conditioning systems and no application of this technology.

CO2 from no application of technology – CO2 from application of technology (g)	CO2 credit(g)
0 or less	0
0 or more and less than the value of list specified in paragraph 2. B	CO2 from no application of technology – CO2 from application of technology
More than the value of list specified in paragraph 2. B	the value of list specified in paragraph 2. B

4) The manufacturer willing to receive the CO2 credit for technology for improving the efficiency of air conditioning system for the vehicles delivered from 2020, shall submit the type of air conditioning system with each vehicle platform, and shall adjust the CO2 credit for at least one air conditioning system with each vehicle platform in a year according to the procedures specified in 1) thru 3). However, in the first year of receiving the CO2 credit, the tested vehicle configuration shall be the highest production

vehicle configuration within each platform.

5) Credits may continue to be generated by the air conditioning system installed in a vehicle platform if the air conditioning system components do not change in any way that could be expected to cause a change in its efficiency;

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Attachment 1>

Approval application for eco-innovation technology					Duration Technical review 60days (Max 90 days)
Applicant	① Company name				
	② President name		③ Business No.		
	④ Address				(Tel. No. :)
⑤ Address of facility					(Tel. No. :)
⑥ The name of applied eco-innovation technology					
⑦ Reduced CO2 emission or Improved FE					(g/km) Or (km/L)

Apply for the eco-innovation technology according to Article 4, Clause 1 of 'Guideline for the approval of the greenhouse gas emission reduction and fuel economy improvement effect of motor vehicles by eco-innovation technology'

year month day

Applicant (Signature or seal)

To the minister of MOE

※ Required documents	
1. Detailed explanation on applied technology	Fee
2. Explanation data to satisfy the approval criteria of Article 3	
3. Detailed explanation data on the evaluation method for reduced amount	
4. Calculation method of DF & UF (if applied)	
5. Applied vehicle model	0
6. Test report	

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Attachment 2>

Approval No.	**Approval certificate for eco-innovation technology**		
② Company name		②President name	
③ Address	(Tel. No. :)		
④ Address of facility	(Tel. No. :)		
⑤ The name of applied eco-innovation technology			
⑥ Certified credits reduced CO2 emission or improved FE	(g/km) or (km/L)		

Approved as the eco-innovation technology, according to Article 4 clause 5 of 'Guideline for the approval of the greenhouse gas emission reduction and fuel economy improvement effect of motor vehicles by Eco-innovation technology'.

Year Month Date

Ministry of MOE (Seal)

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(Back)

⑦ Applied vehicle model								
Vehicle name (Type)	Engine Type	Displace -ment	Max Output	Transmission (Gear)	Option	Curb Weight	Gross Vehicle Weight	Base of Additional certification

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Regulations for Certification, Test Method and Procedure of Manufactured Motor Vehicles
MOE Notification 2016-197 (2016.10.14)

Chapter 1; General

Article 1 (Purpose)
The regulations(called "the Regulation" hereinafter) are set forth to specify the necessary provisions for the enforcement of the certification method and procedure of manufactured motor vehicles and their tests pursuant to the following provisions: Article 48 and Article 50 Clause 5 of the Atmospheric Environment Preservation Act (called "AEPA" hereinafter), Article 47 Clause 2, Article 48 Clause 1, Article 50 Clause 1 of the Enforcement Ordinance(called "AEPA Ordinance" hereinafter) of the AEPA, Article 62, Article 64 Clause 1, Clause 3 and Clause 4, Article 65 Clause 1 and Clause 3, Article 66 Clause 1, Article 67 Clause 2, Article 68, Article 70 Clause 2, Table 5, Table 17 and Table 19 of the AEPA Enforcement Regulation(called "the AEPA Regulation" hereinafter), Article 31 of the Noise and Vibration Control Act(called "NVCA" hereinafter), Article 5 Clause 2, Article 6 Clause 1 of the Enforcement Ordinance(called "NVCA Ordinance" hereinafter) of the NVCA, Article 29, Article 30 Clause 1 and Clause 3, Article 31 Clause 1 and Clause 3, Article 33 Clause 1, Article 34 Clause 2, Article 36 Clause 2, Article 37, Table 3, Table 13 and Table 14 of the NVCA Enforcement Regulation(called "the NVCA Regulation" hereinafter), and Article 30 Clause 1 of the Enforcement Ordinance of Special Act on Capital Region Air Quality Improvement..

Article 2 (Definitions) The definitions of the terms used in the Regulation are as follows:

1. "Individual vehicle" means a vehicle imported from a party who is not a manufacturer. In this case, used cars mean the vehicles specified as used cars on the import licenses pursuant to the Foreign Trade Act.
2. "Model family" means a group of vehicles which meets the requirement set forth in Table 1 in terms of emission and noise characteristics for each class of vehicles, or Table 2 for On-Board Diagnostic (OBD) family of vehicles designated and notified by the minister of Ministry of Environment (MOE) pursuant to Article 64 Clause 1 Item 7 of the AEPA Regulation.
3. "A vehicle of a basic model" means a vehicle representing a model family which is used for emission and noise tests.

3-2. "A vehicle of a representative model" means a vehicle representing a model family which is used for emission and noise tests for the omission of certification for new

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individual model

4. "Chassis dynamometer" means equipment which enables driving of a vehicle suitable to the road driving conditions.
5. "Engine dynamometer" means equipment on which an engine is mounted and which enables operation of an engine suitable to the output and road driving conditions.
6. "Maintenance" means to adjust, repair, remove, disassemble, clean or replace parts or systems of a vehicle in order to prevent malfunction of parts or deterioration of functions.
7. "Fuel system" means fuel tank, fuel pump, fuel line, and carburetor or fuel injection system, and includes inlet/outlet of the system and evaporative emission control system.
8. "Curb weight" means a weight of a vehicle fully filled with fuel, lubricant and coolant, loaded with a spare wheel and standard parts, and equipped with optional items which are installed in more than 50% of vehicles and driven by the engine power such as air conditioner or power steering, and "Curb weight" of a diesel fueled vehicle tested in ECE15 and EUDC mode means a weight of a vehicle fully filled with fuel, lubricant and coolant, loaded with a spare wheel and standard parts, and added by a driver's weight of 75kg.
9. "Gross Vehicle Weight (GVW)" means a weight of a vehicle loaded with occupants of the designated seating capacity and the loads of maximum loading capacity. "Gross Vehicle Weight" of a diesel fueled vehicle tested in ECE15 and EUDC mode means a technically permissible weight of a vehicle which is loaded with passengers of a maximum seating capacity (75kg/person) and maximum cargo loading on top of the curb weight.
10. "Run-in" means driving of a manufactured vehicle for stabilization of an engine.
11. "Evaporative emission" means fuel evaporated directly into the atmosphere from the fuel system of a vehicle.
12. "Deterioration Factor" means a coefficient used to estimate the change of emission from a vehicle by model family when it is operated up to its useful life.
13. "Diurnal" means evaporative emission emitted from the fuel system by the ambient temperature during daytime.
14. "Hot soak" means evaporative emission emitted after driving according to the predefined driving mode.
15. "Production" means to manufacture (including import) vehicles in order to sell after the acquisition of certification.
16. "Lot size" means the total number of vehicles of the same family deemed to be produced under the same condition or produced during a certain period.
17. "Sample size" means the number of vehicles sampled from an inspection lot for a test.
18. "Periodically regenerating system" means the exhaust after-treatment device (e.g. catalytic converter, particulate trap) that requires a periodical regeneration process in less

than 4 000 km of normal vehicle operation. During cycles where regeneration occurs, emission standards can be exceeded. If regeneration occurs at least once per ECE15 and EUDC mode and that has already regenerated at least once during vehicle preparation cycle, it will not be considered as periodically regenerating system. At the request of manufacturer, the test for periodically regenerating factor may be omitted in case emissions remain below the standard during cycles where regeneration occurs

19. "Defeat device" means any element of design (which senses temperature, vehicle speed, engine rotational speed, transmission gear, manifold vacuum or any other parameter) for the purpose of modulating, delaying or deactivating the operation of any part of the emission control system, that reduces the effectiveness of the emission control system under the condition of normal vehicle operation and use, unlike the emission test mode. Such an element of design may not be considered a defeat device if the device is used to protect the engine against damage or accident and to ensure the safe operation of the vehicle, if the device does not function beyond the requirements of engine starting, or if conditions are substantially included in the emission test mode.

Article 3 (Detailed classification of motor vehicles)

1. "Construction equipment pursuant to Table 3 1. Remark 3 and 2. Remark 3 of the NVCA Enforcement Regulations" means each dump truck, concrete mixer truck and concrete pump truck.
2. "Multi-purpose passenger vehicle pursuant to Table 5 Remark 8 of the AEPA Enforcement Regulations" and "off-road type vehicle pursuant to Table 13 1.D of the NVCA Enforcement Regulations Remark 3" means each vehicle designed for off-road driving which is built on a frame or each vehicle equipped with 4-wheel-drive mechanism or limited slip differential.
3. "Bus pursuant to Table 5 Remark 8 of the AEPA Enforcement Regulations" means each vehicle designed to carry mainly passengers and whose rear side is of box shape.
4. "Van pursuant to Table 5 Remark 8 of the AEPA Enforcement Regulations" means each special purpose vehicle with a roof structure and with a driver's compartment and an isolated cargo compartment, which is used for carriage of goods, or which is equipped with special purpose devices for funeral coach, blood donation, emergency aid, broadcasting etc.
5. "City bus pursuant to Table 17 sub-para. 2.C) Remark 4 of the AEPA Regulation" means each vehicle of general purpose type, seating type and nonstop seating type pursuant to Passenger Vehicle Transportation Business Act Enforcement Ordinance Article 3 Item 1 A. However, for nonstop seating type city bus this provision is applied effective 2003.1.1.

Article 4 (Omission of Certification)

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"Each vehicle recognized by the Minister of MOE as omission of certification necessary" pursuant to Article 47 Clause 2 Item 7 of the AEPA Ordinance, or "each vehicle notified by the Minister of MOE" pursuant to Article 5 Clause 2 Item 7 of the NVCA Ordinance means any one of the following vehicles:

1. Each vehicle used in a confined area such as steel mill, shipbuilding yard, mine, quarry, harbor, airport etc., and not used on a public road. ~~In this case, the emission from the vehicle, if the test method notified by the minister of MOE pursuant to Article 65 Clause 3 of the AEPA Regulation is identical, shall be within the emission standards pursuant to Article 62. If the test method is different, the applicant must prove the test result is same or more stringent than the standards.~~
2. Each manufactured or imported vehicle used for public purposes such as snow-removing, broadcasting, road maintenance, recovery of electricity or telecommunication etc.; maximum 5 units of the same model family manufactured locally or imported for each custom clearance. ~~However, the emission from the vehicle, if the test method is identical, shall be less than the emission standards. If the test method is different, the applicant must prove the test result is same or more stringent than the standards.~~
3. Each vehicle on a public auction pursuant to Article 326 of the Customs Act (limited to newly manufactured vehicles); maximum 5 units of the same model family for each auction.
4. Each electricity-driven vehicle(fueled by other fuels such as gasoline or diesel as a supplementary source of power), CNG vehicle, alcohol-fueled vehicle etc. manufactured for performance test to reduce vehicle emission or manufactured for test operation; maximum 50 units of the same model family)
5. Each vehicle of the same model family with same specifications as the individual vehicle certified pursuant to Article 66 Clause 1 of the AEPA Regulation, and imported by a member of a motor vehicle import organization (non-commercial) authorized by the Minister of MOE pursuant to Article 32 of the Civil Law: 99 units imported, and limited to custom clearance of maximum 10 times, within 1 year from the date of certification (or, in case of two-wheeled motor vehicles, 500 units imported, and limited to custom clearance of maximum 5 times)
6. 9 units custom-cleared by the identical importer at the same time, and of the same specifications as the individual vehicle certified pursuant to Article 66 Clause 1 of the AEPA Regulation, or 19 units in case of two-wheeled motor vehicle with a displacement not exceeding 50cc custom-cleared at the same time as and of the same specifications as the one for individual certification, or all units in case of electricity-driven two-wheeled motor vehicles customs-cleared at the same time as and of the same specifications as the one for individual certification.

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7. The rest of the two-wheeled motor vehicles custom-cleared at the same time as and of the same specifications as the one for individual certification pursuant to Article 13 Clause 2
8. One unit of vehicle, brought in by a Korean national (including the one holding a foreign residence permit), classified as household moving goods set forth in Duty Law Article 96 and Article 1-2 Clause 2 of Notification for custom clearance of household moving goods, except those whose model year has passed 10 years with reference to the year of application
9. vehicles tested in IM240 mode by a testing agency appointed by the minister MOE or Korea Environment Corporation (KECO) ("testing agency") and test report issued (limited to in-use vehicles pursuant to the proviso of Article 2 Clause 1)
10. Individual vehicles powered by electricity only
11. Vehicles purchased from the vehicle manufacturers and rebuilt to be powered by electricity only

Article 5 (Vehicles subject to OBD installation)
Each vehicle set forth in Table 3 shall be equipped with OBD pursuant to Article 64 Clause 1 item 7 of the AEPA Regulation . Table 3-2 illustrates special provisions for vehicles to be equipped with OBD.

Article 6 (Vehicles subject to IM240 mode test)
(1) Each vehicle which may be tested in IM-240 mode pursuant to Table 17 sub-para. 1.D.1) Remark 9 or sub-para. 1.E. Remark 10 or sub-para 1.F. Remark 15 of the AEPA Regulation means individual vehicles which are not used for omission of certification pursuant to Article 4 Item 5 and Item 6.
(2) The Chief of NIER shall specify IM240 on a certificate if tested in IM240 mode (the simplified mode to test used cars).

Chapter 2 Application for Certification and Handing Procedure

Article 7 (Application for certification by vehicle manufacturer)
(1) Anyone who elects to manufacture (including import) vehicles ("vehicle manufacturer") shall submit the application documents for certification or omission of certification pursuant to Article 64 of the AEPA Regulation and Article 30 of the NVCA Regulation through Korea Emission and Noise Certification Information System (KENCIS). Off-line submission may be allowed if access through KENCIS is deemed difficult.
(2) A manufacturer who elects to apply for the certification and the omission of certification pursuant to Clause 1 shall be equipped with the staffs and facilities for the test pursuant to

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Article 50, Clause 2 of AEPA and Article 33, Clause 2 of NVCA or the certification test pursuant to Article 65, Clause 2 of AEPA Enforcement Regulation and Article 31, Clause 2 of NVCA Enforcement Regulation, and shall be checked by the Minister of MOE if they are controlled properly. However, the following cases are exempted.

1. Large or extra-large vehicles manufacturer equipping with the engine manufactured in the approved facility of engine manufacturer.
2. Electric vehicle or electric two-wheeled vehicle manufacturer

(3) Documentation for emission and noise certification shall be made according to Table 4, Table 4-2 for electric vehicles, Table 5 for two-wheeled motor vehicles, Table 5-2 for two-wheeled electric vehicles and Table 7 for OBD or emission reduction devices, and filed according to Table 8 for documentation for emission and noise certification and Table 9 for OBD or emission reduction devices.

(4) The vehicle manufacturer shall submit all information (different design strategies between certification test mode and driving conditions other that test mode, OBD algorithm, calibration, details of designs, test procedures, technical evaluation, etc.) to prove that it is necessary to reduce the performance of the emission reduction system for protecting the engine from its damage or accident and the safe operation of vehicle, and to prove that the defeat device does not apply.

(5) A vehicle manufacturer may submit the documents attached to the request for certification directly to the Chief of NIER. In case of OBD family, information for each monitored component or system of the emission control system and in-house emission test data may not be submitted.

(6) Emission test report and noise test report pursuant to Article 64 Clause 1 Item 4 of the AEPA Regulation and Article 31 Clause 1 Item 2 of the NVCA Regulation shall be submitted as follows:

1. a vehicle manufacturer whose facility and staffs have been confirmed by MOE (validated manufacturer): submit in-house test data at the time of application for (modified) certification
2. a vehicle manufacturer whose facility and staffs have not been confirmed by MOE (non-validated manufacturer): to be replaced by test data tested by testing agency. In this case, OBD confirmation may be replaced by the manufacturer's in-house test data.
3. a vehicle manufacturer who has conducted a witness test after approval by the Minister of MOE: to be replaced by test data tested at the manufacturer
4. However, in the case of electric vehicles, the test report may be replaced by the test results approved by the Minister of MOTIE or by the testing agency appointed by the Minister.

(7) The Chief of NIER shall review the application documents for certification according to

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the procedure and defeat device set forth in Table 10, and, in case of a domestic manufacturer, notify the Minister of MOE of evaluation results.

(8) If the Chief of NIER, upon reviewing the application documents for certification, deems that the documents related to Clause (3) are not submitted, and the details such as vehicle specification is not identical to the application data, and the standard for OBD function is not met, and the details relevant with the function of emission related components are not enough to check the identity of vehicle, and defeat device needs to be checked, the supplementary data may be requested to the vehicle manufacturer.

Article 8 (Application for Certification or Omission of Certification for Individual Vehicle)

(1) An importer who elects to import individual vehicles ("individual vehicle importer") shall submit the application documents for certification or omission of certification through KENCIS. In this case, the test report issued by the testing agency shall also be submitted along with the application documents.(2) An individual vehicle importer may submit the application documents for certification to the Chief of NIER or omission of certification to KECO in one of the following cases:

1. access through KENCIS is deemed difficult
2. less than 10 units a year are imported

(3) "Documents notified by the Minister of MOE" specified in Article 64 Clause 3 of the AEPA Regulation means one of the following documents. In this case, the certificate shall include contents of warranty obligation during the warranty period:

1. emission warranty certificate issued by an insurance company pursuant to Article 5 of the Insurance Act for replacement of the emission related components specified in Table 20 of the AEPA Regulation
2. certificate issued by the importers' association for replacement of the emission related components

(4) An individual vehicle importer may not submit an emission warranty certificate and the necessary documents except those showing condition of engine, odometer reading, catalytic converter, noise reduction device, external view photographs including VIN which justify the identical specifications with the individual vehicle for which omission of certification has been granted if more than one unit a year are imported.

(5) If an individual vehicle importer applies again for certification for a vehicle which failed the test the attached documents do not need to be submitted.

(6) An individual vehicle importer may submit test data issued by the foreign recognized testing agency at the time of application for certification if it is not possible to test at the testing agency. In this case, the emission or noise, if the test method notified by the minister of MOE pursuant to Article 65 Clause 3 of the AEPA Regulation or Article 31 Clause 3 of the NVCA Regulation is identical, shall be within the emission standards pursuant to Article

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62 of the AEPA Regulation or the noise standards pursuant to Article 29 of the NVCA Regulation. If the test method is different, the applicant must prove the test result is same or more stringent than the standards.

(7) Documentation for individual vehicle certification for emission and noise shall be according to Table 11, or Table 12 for omission of certification.

(8) The testing agency shall, within 5 days from the date of application for test (Form No. 28-2), notify the applicant of information further necessary or emission and noise test schedule together with information as follows:

1. the test must happen within 90 days from the test date notified
2. the applicant shall be responsible for common damage which may be experienced during the emission, noise or OBD tests.

(9) The Chief of NIER may, upon requested for certification according to Clause 2, request KECO to evaluate the application if appropriate.

(10) The Chief of NIER shall, within 5 days from the date of application for certification, notify the applicant of information further necessary, if any.

(11) KECO may confirm identity of individual vehicle and the test vehicle for omission of certification. However, this requirement does not apply if a certificate issued by a motor vehicle import organization is submitted for omission of certification pursuant to Article 4 Item 5.

(12) A certificate issued according to the proviso of Clause 11 shall be logged in the Form 29.

Article 9 (Modification of Certification)

(1) Items subject to modified certification pursuant to Article 67 Clause 1 of the AEPA Regulation and Article 34 Clause 3 of the NVCA Regulation mean those shown in Table 13.

(2) In the event that a modification of certification is requested to the Minister of MOE pursuant to Article 67 Clause 2 of the AEPA Regulation and Article 34 Clause 2 of the NVCA Regulation, each of the following documents shall be submitted:

1. document which can prove belonging to the same model family
2. details of the modification for certification

Article 10 (Changing a modified model to a basic model)

(1) In the event that the production of the basic model certified is discontinued the manufacturer may select one of the modified models for a new basic model.

(2) If changing a basic model according to Clause 1 above falls in any case of Table 13, the applicable documents stated in Article 67 Clause 1 of the AEPA Regulation, or documents stated in Article 9 Clause 2 Item 1 if not applicable.

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Chapter 3 Emission and Noise Tests

Article 11 (Selection of Emission Test Vehicle)

(1) The Minister of MOE, KECO or a validated manufacturer ("the Minister of MOE etc.") shall select a test vehicle among the same model family for emission test done on a chassis dynamometer pursuant to Article 65 Clause 2 Item 1 of the AEPA Regulation in the following order:

1. a vehicle with a highest equivalent loaded vehicle weight
2. a vehicle with a highest road load. However, if the tires of test vehicles have three RRC or less, the highest RRC tires shall be chosen. In case of 4 RRC or more, the 2nd highest RRC tires shall be chosen.
3. a vehicle with a biggest engine displacement
4. a vehicle with a transmission of a highest final drive ratio(including overdrive)
5. a vehicle with a highest axle ratio
6. a vehicle with a highest fuel tank capacity

(2) The Minister of MOE etc. shall select a test engine among the same engine family for emission test done on an engine dynamometer in the following order:

1. diesel engine
   A. an engine with a highest fuel distribution rate for each cycle at an engine speed developing a highest torque
   B. an engine with a highest fuel distribution rate for each cycle at a maximum engine speed
2. gas or gasoline engine
   A. an engine with a biggest engine displacement
   B. an engine with a highest fuel distribution rate for each cycle at a maximum engine speed
   C. an engine with fastest ignition timing
   D. an engine with a smallest EGR ratio
   E. an engine having no induction air pump or smallest pump in capacity

(3) The Minister of MOE etc. shall select a test vehicle which has the smallest canister absorption capacity among the evaporative family for evaporative emission test, or a vehicle which has largest evaporative emission due to characteristics of evaporative emission related components.

(4) The Minister of MOE etc. shall select a test model among the family for certification test of large/extra-large PC and Trucks which are subjected to the in-use compliance test according to Table 17 of AEPA Enforcement Regulation, and perform Real Driving Emission. However, a vehicle which has largest Real Driving Emission due to technical characteristics of emission related components may be selected, except CNG vehicles for which annual production is less than 50 units per for same emission family.

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(5) In the event that the test vehicle fails the certification test pursuant to Article 65 Clause 2 of the AEPA Regulation, the testing agency shall sample the emission test vehicle two times the previous size, limited to two times.

Article 12 (Selection of Noise Test Vehicle)

(1) The Minister of MOE etc. shall select a test vehicle for a noise test pursuant to Article 31 Clause 2 of the NVCA Regulation in the following order:

1. a vehicle with a highest curb weight
2. a vehicle with a biggest engine displacement
3. a vehicle with a transmission of a highest final drive ratio(including overdrive)
4. a vehicle with a highest axle ratio

(2) In the event that the test vehicle fails the certification test pursuant to Article 31 Clause 2 of the NVCA Regulation, the testing agency shall sample the noise test vehicle two times the previous size, limited to two times

(3) The specification of test vehicle shall be identical to the specification of manufactured and imported vehicle (structure, device, and performance shall be identical to those in specification table). Otherwise, the test can be refused.

Article 13 (Selection of Emission and Noise Test Vehicle for Individual Certification)

(1) The testing agency shall select an emission and noise test vehicle for omission of certification which has covered not more than 6,400km (or 1,000km in case of two-wheeled motor vehicle, or 200km if less than 50cc and electricity-driven two-wheeled motor vehicles), and confirm if the test vehicle is identical to the application document at the time of selecting it:

(2) The testing agency shall select the test vehicles according to Table 13-2 for individual certification pursuant to Article 8 for 21 units or more of the two-wheeled motor vehicles of the same specifications and custom-cleared at the same time. However, electric two-wheeled motor vehicles shall be exempted.

(3) The testing agency shall select test vehicles of the same specifications and custom-cleared at the same time two times the number of initial test vehicles which have been judged fail at the certification test pursuant to Article 65 Clause 2 of the AEPA Regulation or Article 31 Clause 2 of the NVCA Regulation, and confirm if the test vehicles are identical at the time of selecting it.

Article 14 (Run-in of Emission Test Vehicle)

(1) The testing agency or a validated manufacturer shall conduct an emission test on a chassis dynamometer after the vehicle is run-in for 3,000km or more according to the durability

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driving schedule in Table 14 or in a similar manner.
(2) The testing agency or a validated manufacturer shall conduct an emission test on an engine dynamometer after the engine is run-in for 100 hours which includes 50 hours of operation in full load.
(3) An emission test for individual certification or modified certification does not require run-in except that evaporative emission test for modified certification is necessary:

Article 15 (Omission of emission test or noise test in partial)
(1) A cold CO test may be omitted for modified certification, and an evaporative emission test may be omitted if none of the items related to the evaporative emission has been modified.
(2) Any of the pass-by noise test, exhaust noise test or horn noise test may be omitted if it is not affected by the modification.
(3) An evaporative emission test and a cold CO test may be omitted for individual certification, and an evaporative emission test and OBD test may be omitted for individual certification for two-wheeled vehicles.

Chapter 4 Durability Tests

Article 16 (Selection of Durability Test Vehicle)
(1) The Minister of MOE etc. shall select test vehicles for a durability test("Durability test", hereinafter) pursuant to Article 65 Clause 2 Item 2 of the AEPA Regulation whose estimated sales volume is biggest with a same engine displacement among the model family, in consideration of type of gearbox, fuel system and inertia weight class. However, in case of diesel fueled vehicles, a test vehicle may be selected according to Item 5 in Table 1.
(2) The Minister of MOE etc. may additionally select vehicles identical to the test vehicles selected according to Clause 1.
(3) The Minister of MOE etc. may randomly select test vehicles from the production line if it is needed to update the durability data for a model under mass-production.

Article 17 (Driving of Durability Test Vehicle and Operation of Durability Test Engine)
(1) In the case of durability test using a chassis dynamometer the durability test vehicle shall be driven up to the mileage of the emission warranty period specified in Table 18, according to the driving schedule specified in Table 14 and the driving schedule for durability test on the chassis dyno or the road in Table 14-2 for two-wheeled vehicles. In case of two-wheeled vehicles, however, the vehicle may be driven, upon the request of manufacturer, up to 50% of emission warranty period.

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(2) The weight of the test vehicle shall not exceed the curb weight more than 45kg throughout the durability test.
(3) In the case of durability test using an engine dynamometer the engine shall be operated as much as the warranty period.
(4) In the event that modification of the details for certification within the scope of model family occurs during the durability test, the details of the modification and the attachment after modification shall be submitted at the time of application for certification or at the time of final reporting of the durability test.

Article 18 (Maintenance of Durability Test Vehicle and Submission of Data)
(1) A vehicle manufacturer may service durability test vehicles according to the maintenance schedule within the scope of service items specified in Table 15. However, before reaching 8,000km, readjustment of idle speed or air fuel ratio may be done one more time than the frequency specified in the maintenance schedule.
(2) A vehicle manufacturer may conduct unscheduled maintenance in addition to the scheduled maintenance in one of the following cases:
1. replacement of spark plug or injection system if misfire is repeated
2. readjustment of choke for cold start if engine stalls repeatedly or visible smoke is emitted
3. readjustment of idle control if idle speed defers more than 300rpm from the rated speed or engine stalls repeatedly
4. maintenance (limited to one time) during the durability test if catalytic converter is defective or service warning lamp for periodic maintenance is lit
5. maintenance of defective components or system which does not affect representation of a test vehicle, or maintenance which does not cause direct effect to combustion chamber (except removal or replacement of spark plug, fuel injection system, or removable preheater
6. maintenance to repair repeated misfire, engine stall, overheat, fuel leaking, low oil pressure, malfunction of low battery voltage alarm
7. maintenance of evaporative emission control system due to smell of fuel, leakage of fuel or lubricant etc.
8. maintenance (up to three times) of EGR system upon detection of malfunction
9. maintenance of EGR which is understood not affecting representation of emission test results
(3) A vehicle manufacturer shall keep the records of the service performed pursuant to Clause (1) and (2) above, and submit them when applying for certification.

Article 19 (Emission Test for DF calculation)
(1) In the case of emission tests using a chassis dynamometer for calculation of DF, the test

including the first test at 6,400km shall be done as much as the following frequencies with proper intervals. In this case, evaporative emission tests shall be done at least 3 times; for diesel vehicles, the test may be done more than times according to warranty period with proper intervals.

1. 5 times for warranty period of 100,000km or less
2. 7 times for warranty period of 120,000km
3. 9 times for warranty period of 160,000km
4. 10 times for warranty period of 192,000km
5. 12 times for warranty period of 240,000km.

(2) Emission test in ECE15+EUDC mode may be done one time only at the above test timing.

(3) In the case of emission tests using an engine dynamometer for calculation of DF, the test shall be done 6 times with proper intervals during the operating hours specified in Article 17 Clause 3.

(4) In the case of emission testing for calculation of DF for two-wheeled vehicles, the test may be performed as specified in Table 14-2 by separating the driving schedule pursuant to Article 17 Clause 1.

Article 20 (DF Calculation)

(1) In the case of Article 19 Clause 1 and Clause 3 in order to determine a DF, a regression line obtained by the method of least squares using the overall data of the emission tests shall be drawn and a DF shall be calculated in each of the following methods:

1. DFs for CO, tail pipe HC, NOx and PM shall be calculated by dividing or deducting the emission at the warranty period by the emission at 6,400km.
2. DFs for evaporative HC and smoke shall be calculated by deducting the emission at 6,400km from the emission at the warranty period.
3. For diesel vehicles, DFs for CO, tail pipe HC, NOx and PM may be calculated by deducting the emission at 6,400km from the emission at the warranty period

(2) In the case of Article 19 Clause 3, in order to determine a DF, a regression line obtained by the method of least squares using the overall data of the emission tests shall be drawn and a DF shall be calculated in each of the following methods:

1. DFs for CO, tail pipe HC, NOx and PM shall be calculated by dividing or deducting the emission at the initial driving point by the final driving point of emission warranty.
2. DFs for evaporative HC and smoke shall be the test results from installing the bench-aged parts specified in Table 17-3.

(3) The emission test value for calculation of a DF shall be adjusted according to KSA3521-1 in each of the following method. However, a DF for smoke may be rounded to an integer.

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1. rounded to 4 decimal places for Clause 1 Item 1, or 1 if a DF calculated by dividing is less than 1 0 and 0 if a DF calculated by deducting is less than 0
2. rounded to 2 decimal places for Clause 1 Item 2, or 0 if a DF calculated is less than 0.

Article 21 (Assigned DF)
The assigned DF pursuant to the proviso of Article 65 Clause 2 Item 2 of the AEPA Enforcement Regulation are set forth in Table 16.

Article 22 (Bench Aging for Emission Related Components)
(1) Bench aging for emission related components (ERCs) defined by the Minister of MOE pursuant to the proviso of Article 65 Clause 2 Item 2 of the AEPA Enforcement Regulation are set forth in Table 17 and Table 17-2 or its equivalent method, approved by the Minister of MOE, may be applied.
(2) A test vehicle for calculation of DFs according to Article 19 using bench aged ERCs shall be driven more than 6,000km, and then be tested at least two times each before and after the bench aged ERCs are replaced. Additional emission test may be performed in consideration of more precise characteristics for durability. However, for diesel vehicle, a test vehicle is driven more than 3,000Km and then may be tested.
(3) DFs obtained utilizing bench aging shall be calculated such that the average of emission before replacement of bench aged ERCs are divided by the average of emission after replacement, except that the assigned DF for evaporative HC may be used instead of (3) DFs obtained utilizing bench aging shall be calculated such that the average of emission before replacement of bench aged ERCs are divided or deducted by the average of emission after replacement, except that the assigned DF for evaporative HC may be used instead of calculating it utilizing bench aging.
(4) DFs, for diesel vehicle, obtained utilizing bench aging shall be calculated by deducting the average of emission before replacement of bench aged ERCs obtained according to Clause 2 from the average of emission after replacement or by dividing the average of emission after replacement of bench aged ERCs by the average of emission before replacement.

Chapter 5 On-Board Diagnostics (OBD) and Emission Reduction Devices

Article 23 (Selection and test of OBD test vehicle)
(1) A vehicle manufacturer shall select a vehicle whose OBD monitoring test is most complicated among the OBD family set forth in Table 2.
(2) A vehicle manufacturer shall test the vehicle selected according to Clause 1, complete the

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Form 26, and submit it at the time of application for certification.
(3) The testing agency shall review the test results submitted according to Clause 2, and if it is deemed necessary to confirm OBD operation the testing agency may visit the vehicle manufacturer to verify the malfunction parts or malfunction simulators.

Article 24 (Performance of Emission Reduction Devices)
The following information shall be included in the application document for certification in Form 7 (Performance of Emission Reduction Devices) if Selective Catalytic Reduction (SCR) or Exhaust Gas Recirculation (EGR) is installed:

1. malfunction alarming system for urea charge or reduction devices
2. feature limiting the vehicle driving or output to encourage service of urea or reduction devices
3. feature monitoring use of urea of poor quality or arbitrary removal of reduction devices
4. prevention of freeze or melting of urea
5. substitution if EGR not using NOx sensor is fitted
6. tamper protection

Chapter 6 Certification Test and Disposition of Test Results

Article 26 (Classification of Certification Tests)
(1) Pursuant to the proviso of Article 65 Clause 3 of the AEPA Enforcement Regulation and the proviso of Article 31 Clause 3 of the NVCA Enforcement Regulation a certification test shall be done by the testing agency in one of the following cases:
1. a non-validated manufacturer has applied for certification
2. a validated manufacturer requests a test by the testing agency
(2) Pursuant to the proviso of Article 65 Clause 3 of the AEPA Enforcement Regulation and the proviso of Article 31 Clause 3 of the NVCA Enforcement Regulation a certification test may be done by the manufacturer but witnessed by the testing agency in each of the following cases:

1. it is necessary to use manufacturer's facility due to non-availability of it with the testing agency. In this case, in-house witness test shall be requested to the Minister of MOE
2. a foreign vehicle manufacturer requests the testing agency for in-house witness test (limited to the case using assigned DF).

(3) A validated manufacturer may conduct a test for (modified) certification or durability test in house using the facilities and staffs confirmed by the Minister of MOE.
(4) In the event that it is deemed necessary by the Minister of MOE to verify the result of the in-house certification test by the manufacturer, the chief of NIER may conduct a test

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Article 27 (Calculation of Emission Test Results)

① The Testing Agency or a vehicle manufacturer shall calculate the emission test results in the following method:

1. CO, tail pipe HC, NOx, particulate number and particulate matter:
   (measured value from the emission test) x (DF for each pollutant) or
   (measured value from the emission test) + (DF for each pollutant)
2. evaporative HC and smoke:
   (measured value from the emission test) + (DF for each pollutant) or emission test results from installing bench-aged parts (limited to two-wheeled vehicle)
3. CO, tail pipe HC, NOx and particulate matter for diesel vehicles with periodically regeneration system:
   ((measured value from the emission test) x (periodically regeneration factor)) x (DF for each pollutant) or
   ((measured value from the emission test) x (periodically regeneration factor)) + (DF for each pollutant)

② Periodically regeneration factor shall be calculated in accordance with Table 17-3

Article 28 (Reporting Test Results)

The test results according to Article 27 shall be reported to the Minister of MOE (or the chief of NIER in case of an importer) in Form 15 through Form 27-2, however, this is not applicable if the test results are reported through KENCIS.

Article 29 (Judgment of Emission and Noise Certification)

(1) In the event that the certification test results are judged in compliance, the certification shall be released by the Minister of MOE or Chief of NIER after evaluating if the emission related components are technically feasible according to Table 10.

(2) The Minister of MOE or Chief of NIER shall judge the test acceptable only when all the test vehicles sampled two times the initial size pursuant to Article 11 Clause 4, Article 12 Clause 2 and Article 13 Clause 2 pass the test.

(3) In the event that any model subject to the omission of certification falls in the case defined in Article 47 Clause 2 Item 5 of the AEPA Ordinance, KECO shall determine the omission of certification after checking if vehicles have been made to a different classification of vehicle (exceeding 2.5 tons of curb weight and 3.5 tons of GVW) set forth in Table 5 of AEPA Regulation

(4) In the event that it is discovered that vehicles in production do not meet the requirement specified in Clause 3, the Minister of MOE may request the vehicle manufacturer to submit a

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corrective action plan and recommend to implement it.
(5) KECO may specify in Form 33 the usage of a vehicle presented for omission of certification for after-sales management.

Article 30 (Exemption of Issuance of Certificate of Omission)
A certificate of omission may be replaced by its copy for vehicles whose Specification Control Number or Type Approval Number is same.

Article 31 (Waiver for OBD monitoring items) (1) The Minister of MOE or Chief of NIER may judge the test acceptable although two or less monitoring items would not meet the criteria of the test regulation if it is deemed that the best available technology have been implemented for the non-complying item, a good-faith effort to meet the requirements in full have been demonstrated, and the manufacturer has explained the details about the deficiency and submitted a plan for improvement to meet the requirements within 2 years after certification, with the exception of one of the following cases:

1. the deficiency is for oxygen sensor, catalyst or misfire in case of gasoline vehicles,
2. monitoring of the emission related components is disabled or the deficiency causes emission to exceed the malfunction criteria limit in case of diesel vehicles

(2) If the manufacturer discovers any deficiency within 160 days after the start of production and request for a waiver, the Minister of MOE or Chief of NIER shall regard it as requested before the certification.
(3) If the manufacturer submits a plan for improvement according to Clause 2, the emission certification is considered valid for 2 years from the date of production, except the cases in Clause 1.

Article 32 (Reapplication for Certification of Non-compliance Vehicle)
(1) In the event that a vehicle manufacturer elects to reapply for certification for a vehicle which has been judged unacceptable according to Article 29, the manufacturer shall implement corrective actions prior to reapplication. However, the manufacturer may reapply for certification with a new vehicle using the durability data obtained from the initial test vehicle if it is recognized by the Minister of MOE that the vehicle tested cannot represent the model family.
(2) If a vehicle imported by an individual vehicle importer has met the emission standards but failed OBD test, the applicant may apply for a retest of OBD only.

Article 33(Identification of Certification)
(1) A vehicle manufacturer shall identify the contents of the certification on a label according

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to Table 18 on each manufactured vehicle certified pursuant to Article 48 of the AEPA. However, the requirement is not applicable to individual vehicles for which certification are omitted.

(2) The label according to Clause 1 shall be attached permanently inside the engine room where easily visible. However, the label for two-wheeled vehicles, and large-sized or extra large-sized passenger cars and trucks may be attached on an engine.

Article 34 (Provision of Owner's Manual)

(1) A manufacture shall provide each purchaser of a vehicle with an owner's manual written in Korean which illustrates guidelines for operation and service for the systems and components related to the emission and noise for the normal operation and which illustrates guidelines when the malfunction indication lamp (MIL) by OBD system is lit.

(2) An individual vehicle importer shall provide each purchaser of a vehicle with a document related to the warranty of the emission related components.

(3) The owner's manual shall include the warranty period for the emission related components pursuant to Article 76 of the AEPA Regulation.

Article 35 (Technical Staffs and Facilities Management for Certification Test)

(1) Technical staffs and facilities for foreign manufacturers pursuant to Table 19 Remark 2 of the AEPA Enforcement Regulations means the facilities certified according to the regulations set forth by the foreign certification agency and the persons who have serviced in the related field for not less than 3 years.

(2) A vehicle manufacturer shall report the status of technical staffs and facilities in Form 30 pursuant to Article 70 of the AEPA Regulation and Article 36 of the NVCA Regulation.

(3) A vehicle manufacturer shall promptly report the changes in one of the following cases to the Minister of MOE in Form 31:

1. staffs newly joined, dismissed or transferred
2. facilities expanded, voided or relocated

(4) By the end of February of each year the Minister of MOE shall make a plan to visit the manufacturers, which must be checked if their emission facilities and staffs are properly controlled in accordance with Article 70-2 of AEPA Enforcement Regulation, grouping them by region, to confirm on site if the manufacturers maintain the qualification for test. In this case, the staffs and facilities for noise test pursuant to Clause 2 are included.

(5) The minister of MOE (including the testing agency appointed by the minister of MOE) shall confirm the followings for the technical staffs and test facilities to be equipped by a manufacturer set forth in Table 19 of the AEPA Regulation and Table 14 of the NVCA Regulation:

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1. check if the structure and performance of the test facilities is same as or superior to those type-approved pursuant to Article 9 of the Environmental Test and Inspection Act("ETIA").
2. check if calibration of the test facilities and maintenance of preciseness of the calibration devices is done according to the standard and procedure specified by Article 9 of ETIA.
3. check if the pass-by noise test track conforms to the Korean Standard (KS) requirement.
4. for domestic manufacturers check if technical staffs set forth in Table 19 of the AEPA Regulation and Table 14 of the NVCA Regulation are available, or for foreign manufacturers check if working experience, training experience, academic background etc. of the technical staffs are same as or more than the domestic requirement.

(6) The minister of MOE shall issue a certificate (Form No. 32) if the staffs and facilities reported pursuant to Clause 4 conform to the requirements set forth in Clause 5.

(7) The minister of MOE shall withdraw the certificate (Form No. 32) in one of the following cases:

1. test data for certification test or periodic test submitted have been forged
2. a case coming under Article 55 (Cancellation of Certification) of the AEPA

(8) Vehicle manufacturers which import vehicles from EU shall be deemed to have received the certification for emission facility of diesel vehicles and two-wheeled vehicles, noise facility for vehicles and two-wheeled vehicles (limited to facilities in EU) in accordance with clause 6 if they received the type approval for facilities from the UN.

Chapter 8 Spot Test

Article 36 (Vehicles subject to Spot test and instruction for test)

(1) A spot test pursuant to Article 48 Clause 1 Item 1 of the AEPA Ordinance and Article 6 Clause 1 Item 1 of the NVCA Ordinance may be executed by NIER in each of the following cases:

1. it has been less than 4 years since the vehicles for sale have been manufactured(including imported) after the basic or modified certification.
2. it is deemed necessary by the minister of MOE to verify the conformance of the standard after reviewing the number of or the rate of warranty claims for rectification of defective components pursuant to Article 53 of the AEPA, customer complaints relating to the emission related components, examples of recall in other countries, and the result of various tests such as periodic test and in-use vehicle test.

(2) <Deleted>

(3) The chief of NIER shall notify the vehicle manufacturer of Instruction for Spot Test (Form 33) which includes following matters:

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1. transportation and storage of a sampled vehicle
2. test of a sampled vehicle and submission of the test result

Article 37 (Sampling of vehicles)

(1) NIER shall sample vehicles randomly according to the Table 19 based on the number of annual production by model family, except that 1 unit shall be sampled in one of the following cases:

1. spot test pursuant to Article 36 Clause 1 Item 1 or Item 3
2. the number of production in the previous year is less than 50
3. noise test.

(2) A form (Form 34) identifying a spot test shall be affixed at the easily visible location such as front windshield or engine by the chief of NIER.

(3) The chief of NIER may seal the bonnet of the vehicle or the engine control unit of the vehicle sampled (including engine sampled) pursuant to Clause 1.

Article 38 (Testing of a sampled vehicle)

(1) The chief of NIER shall conduct emission and noise tests according to the test procedures determined by the Minister of MOE pursuant to Article 50 Clause 2 of the AEPA and Article 33 Clause 2 of NVCA, except that the test in ECE15 and EUDC mode and the test for a two-wheeled motor vehicle may be concluded at the first test if the emission measures less than the emission standards.

(2) A spot test pursuant to Article 36 Clause 1 shall be done at the testing institute (hereinafter, "Testing institute") designated by the Minister of MOE in accordance with Article 71 of AEPA Enforcement Regulation, and a test using an engine dynamometer may be done at the manufacturer witnessed by an officer appointed by the chief of NIER or testing institute.

(3) In the event that the chief of NIER is supposed to perform the test at the testing institutes pursuant to Clause 2, he/she shall notify a vehicle model subject to spot test to each relevant institutes and request them to perform the test.

(4) Run-in may be omitted or shortened if the manufacturer elects to do so.

(5) OBD and defeat device may be included to the test items necessary for spot test as well as test items of [Table 17] 'Exhaust Emission Standards of Motor Vehicles' of AEPA enforcement regulation. However, an evaporative emission test and a cold CO test may be excluded considering the strengthened emission standard and revised test method.

Article 39 (Submission of test result)

Upon completion of emission and noise test done pursuant to Article 38 Clause 2, the vehicle

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manufacturer shall complete the Form No. 15 through Form No. 27-2 and submit to the chief of NIER.

Article 40 (Judgment of Pass/Fail)

(1) The chief of NIER shall judge the vehicle as 'fail' if the result of the test pursuant to Article 39 shows that one or more pollutants exceed the emission standards.

(2) If the number of units failed pursuant to Clause 1 is equal to or less than the number for 'pass' shown in Table 19, the lot from which the test vehicle has been sampled shall be accepted, and if the number units failed is equal to or greater than the number for 'fail' the lot shall be rejected.

(3) If only one unit has been sampled pursuant to the proviso of Article 37 Clause 1, the lot shall be accepted if the sample passes the test, or further sampling shall be done according to Table 19 but a vehicle failed in the 1st test is included to the counting of test vehicle units.

(4) If the number of units failed pursuant to Clause 1 is equal to or greater than the number for 'pass' of Table 19 or equal to or less than the number for 'fail', more units shall be sampled gradually until 'pass' or 'fail' judgment according to Clause 2 is made. In this case, the gradual sample size shall be the accumulative numbers. However, if the manufacturer admits 'fail' of the lot, the lot shall be rejected and the test shall be concluded.

(5) Notwithstanding Clause 3 and Clause 4, if determining the pass or fail for the spot test for large or extra-large sized vehicles and trucks subjected to the in-use compliance test pursuant to Table 17 of AEPA enforcement regulation, the method of determining the result for in-use compliance test pursuant to Article 74 of AEPA enforcement regulation shall be applied.

Article 41 (Retest)

(1) A manufacturer which has been rejected pursuant to Article 40 and instructed by MOE Minister to hold selling and delivery may apply for the retest in accordance with Article 68 of AEPA Enforcement Regulation and Article 37 of NVCA Enforcement Regulation.

(2) In the event that a retest is done pursuant to Clause 1, the chief of NIER shall sample units from the same lot according to Article 37 Clause 1 and shall perform the retest according to Article 38. However, if break-in, etc. is necessary, the vehicle failed may be retested.

(2) The judgment of pass or fail after a retest pursuant to Clause 1 shall be made according to Article 40.

(3) In the event that a retest is done pursuant to Clause 1, one unit of the samples shall be run in for 6,400km pursuant to Article 4. However, if the manufacturer elects not to do so, or if it is the case of the exceptional provision of Article 8 Clause 1, run-in may be omitted.

Article 42 (Disposition of rejected lot)

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(1) In the event that the vehicle manufacturer elects to sell the sampled vehicles which have been rejected pursuant to Article 40 Clause 1, each unit shall be tested for individual judgment by NIER or testing institutes.
(2) In the event that the vehicle manufacturer elects to sell the vehicles which have been rejected pursuant to Article 40 and instructed by MOE Minister to hold selling and delivery, the manufacturer shall rectify the vehicles of the relevant lot and be judged as 'Pass', and the manufacturer shall establish the defect-rectification plan for the vehicles already sold and be approved by the Minister of MOE. However, if a manufacturer is to sell the vehicle prior to retest pursuant to Article 41 or prior to the implementation after approved for defect-rectification plan, each unit shall be tested by NIER or testing institutes and shall be judged as 'Pass",
(3) In the event that each unit is tested by testing institutes pursuant to Clause 1 and Clause 2, the test results shall be reported to a chief NIER.

Article 43 (Void of certification)
(1) The Minister of MOE or Chief of NIER shall void certification of the vehicles if the lot rejected according to Article 40 is rejected again despite a retest pursuant to Article 41 and if it falls in the case of Article 55 of the AEPA or Article 34 of the NVCA.
(2) In the event that the Minister of MOE or Chief of NIER is to void the certification pursuant to Clause 1, the Minister shall file a lawsuit against the manufacturer (or the importer) pursuant to Article 89 Item 6 of the AEPA or Article 56 Item 2 of the NVCA.

Chapter 9 Periodic Test

Article 44 (Lot for Periodic Test)
(1) A lot for a periodic test shall be the monthly production (or units custom cleared for imported vehicles) of model family. If a lot size is less than 501 units, a lot shall be formed in the month or quarter in which accumulated total reaches 501.

Article 45 (Test Vehicle Selection and Test)
(1) Test vehicles shall be sampled from a lot based on the 'proportional sampling' method as follows, or 1 unit shall be sampled for a noise test:

1. a lot size is equal to or greater than 501, and equal to or less than 10,000: 1 unit (2 units for two-wheeled motor vehicles)
2. a lot size is equal to or greater than 10,001, and equal to or less than 25,000: 2 units (3 units for two-wheeled motor vehicles)
3. a lot size is equal to or greater than 25,001: 3 units (5 units for two-wheeled motor

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vehicles)
(2) A vehicle manufacturer shall randomly sample the vehicles of a model of the largest production among the model family, or sample the vehicles of a model for which periodic test is deemed necessary.
(3) Each test vehicle sampled pursuant to Clause 2 shall be identified by a form (Form No. 34) indicating a periodic test which shall be affixed at the easily visible location such as front windshield or engine until the test is over.
(4) The vehicle manufacturer shall conduct the test for the vehicles sampled according to the test procedure, except that the test in ECE15 and EUDC mode and the test for a two-wheeled motor vehicle may be concluded at the first test if the emission measures less than the emission standards.

Article 46 (Judgment of pass/fail)
A vehicle manufacturer shall reject the lot if the result of the test pursuant to Article 45 Clause 4 shows that one or more pollutants exceed the emission standards.

Article 48 (Reporting of test result)
(1) Upon completion of emission and noise tests, a vehicle manufacturer shall report the result to the chief of NIER pursuant to Article 70 Clause 2 of the AEPA Regulations and Article 30 Clause 2 of the NVCA Regulations.
(2) For emission test except smoke test in no load wide-open-throttle test mode, a manufacturer shall report the test results on-line operated by KECO, in Form No. 35, monthly test results within 15 days after the start of the next quarter. However, if a lot is rejected pursuant to Article 19, it shall be reported promptly to the chief NIER.
(3) A vehicle manufacturer shall keep the record of the test in Clause 1 in Form No. 15 through Form No. 27 for 5 years.

Article 49 (Disposition of rejected lot)
(1) A vehicle manufacturer shall handle vehicles of a lot rejected pursuant to Article 46 according to the provision of Article 42.
(2) The chief of NIER, if deemed necessary to verify in-house periodic test report after reviewing the test result pursuant to Article 48 Clause 1, may perform the test.

Chapter 10 Nomination of Certification Testing Agency and Management

(not translated – not applicable to a manufacturer)

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Article 53 (Due Date of Reevaluation) The Notification shall be reviewed for discontinuance or revision, if any, by 2017.6.30, in consideration of the changes of the laws or circumstances pursuant to the Regulations for Announcement and Administration of the Notification (Presidential Notification No. 248).

Addendum<08.07.01>

Article 1 (Date of Enforcement) The Regulation is enforced from the date of promulgation, except that the proviso of Article 4 Item 6 shall be enforced from 2009.1.1.

Article 2 (Interim Measures for Emission Reduction Devices)
(1) The requirements about emission reduction devices according to Article 24 and Article 25 shall be applicable to large-sized or extra large-sized passenger cars and trucks fitted with the devices and manufactured after 2008.8.1.
(2) (not translated)

Article 3 (Interim Measures for engines for construction equipment)
(not translated)

Article 4 (Interim measures for on-going activities according to the previous Regulation) Any activities according to the previous Regulation are regarded conforming to this Regulation.

Addendum<09.01.05>

Article 1 (Date of Enforcement) The Regulation is enforced from the date of promulgation.

Article 2 (Interim measures for DF for evaporative emission test) Vehicles certified prior to application of Table 17 sub-para. 1.F of the AEPA Enforcement Regulations for evaporative emission standard may use the DF applied to the previous standard.

Addendum<09.07.17>

Article 1 (Date of Enforcement)
The Notification shall be enforced from the date of promulgation.

Article 2 (Interim measure for certification test)
Any certification test being done according to the previous regulation at the time of promulgation of this Notification shall be governed by the previous regulation.

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Addendum<2009.12.31>

Article 1 (Date of Enforcement)
The Notification shall be enforced from 2010.1.1.

Addendum<10.07.02>

Article 1 (Date of Enforcement)
The Notification shall be enforced from the date of promulgation.

Article 2 (Interim measure for vehicles subject to omission of certification)
If the individual certification has been granted pursuant to Article 66 Clause 1 for an importer who is a member of a motor vehicle import organization (non-commercial) pursuant to Article 4 Clause 5, omission of certification shall be in effect for vehicles of the same specifications as the one for individual certification until 2010.12.31.

Article 3 (Application for selection of two-wheeled motor vehicles of the same specifications and custom-cleared at the same time)
The selection of test vehicles according to the revised provision of Article 13 Clause 2 shall be done from the two-wheeled motor vehicles for which individual certification is applied after the enforcement of this Regulation.

Article 4 (Application of emission label)
The revised provisions of Table 18 Item 8 shall be enforced from the vehicles manufactured (imported) from 2011.1.1. In the event that remanufacturing of the labels are needed due to use-up etc. the new labels according to the revised provisions may be used.

Addendum<11.02.25>

Article 1 (Date of Enforcement) The Notification shall be enforced from 2011.3.1.

Article 2 (Application for omission of certification) The revised provision of Article 4 Item 5, Item 9 through Item 11 shall apply to the vehicles for which omission of certification is applied after the enforcement of the Notification.

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Addendum<11.12.30>

Article 1 (Date of Enforcement) The notification shall be enforced from 2012.1.1.

Article 2 (Application) The notification shall apply to the vehicles for which certification is applied after the enforcement of the Notification.

Addendum<12.02.15>

Article 1 (Date of Enforcement) The notification shall be enforced after the promulgation

Article 2 (Application) The notification shall apply to the vehicles for which certification is applied after the enforcement of the Notification.

Addendum<13.04.16 >

Article 1 (Date of Enforcement) The notification shall be enforced after the promulgation

Addendum<14.08.18 >

Article 1 (Date of Enforcement) The notification shall be enforced after the promulgation

Addendum <15.1.22>

Article 1 (Enforcement date) This regulation shall be enforced from the promulgation date.

Addendum <2016.10.14>

Article 1 (Enforcement date) This regulation shall be enforced from the promulgation date.

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[Table 1]

Scope of Model Family (Article 2 Item 2)

1. To be classified in the same model (engine) family (except evaporative emission),, engines must be identical in all respects listed below (applicable items only depending on fuel or vehicle class):
   A. the cylinder bore center-to-center dimensions
   B. the cylinder block configuration (air-cooled or water-cooled: L6, 90 deg., V-8 etc.)
   C. the location of the intake and exhaust valves or ports
   D. the method of air aspiration
   E. the combustion cycle
   F. displacement (engines of different displacement within 15% of the largest displacement for gasoline or gas fueled vehicle or within 820cc of the largest displacement for diesel fueled vehicle are included in the same engine family)
   G. catalytic converter characteristics
   H. the dimension from the center line of the crankshaft to the center line of the camshaft
   I. the dimension from the center line of the crankshaft to the top of the cylinder block head face
   J. the size of the intake and exhaust valves (within 3.2mm of the valve head diameter) or ports (within 10% of the port size)
2. Engines identical in all respects listed in Item 1 may be further divided into different engine families (except evaporative emission) if the Minister of MOE determines that they may be expected to have different emission characteristics based on a consideration of the following sub-items of each engine. However, engines with 4 or more sub-items below not identical shall be classified as different engines:
   A. the bore and stroke
   B. the surface-to-volume ratio of the nominally dimensioned cylinder at the top dead center positions
   C. the intake and exhaust manifold port sizes and configuration
   D. the intake and exhaust valve sizes
   E. the fuel system
   F. the camshaft timing and ignition or injection timing characteristics
3. Vehicles identical in all respects listed in Item 1 may be further divided into different model families if the Minister of MOE determines that they may be expected to have different noise characteristics based on a consideration of the following sub-items of each vehicle. However, vehicles with 3 or more sub-items below not identical shall be classified

as different vehicles:

A. overall shape of vehicle(bus, cargo etc.)

B. major structure and performance of the engine

C. type, major structure and performance of the power train(transmission excluded) affecting the vehicle speed

D. major structure and size of the running gear such as axles

E. type, major structure and performance of the exhaust system and noise reduction system

4. To be classified in the same evaporative family, vehicles must be similar with respect to the items listed below:

A. type of vapor storage device (e.g., canister, air cleaner, crankcase)

B. basic canister design (working capacity – grams absorption within a 10g range, system configuration – number of canisters and method of connection, canister geometry, construction and materials)

C. fuel system

D. fillpipe seal mechanism

E. vapor control system (type of valve, vapor control strategy)

F. purge control system (type of valve, purge control strategy)

G. vapor hose material

H. fuel tank material

5. To be classified in the same evaporative family for two-wheeled vehicles, vehicles must be similar with respect to the items listed below:

A. type of evaporative control device

B. principal for operating evaporative control device (active, passive, mechanical or electric control)

C. fuel system (Carburetor, SPI, MPI, air-fuel ratio control)

D. fuel tank material

E. fuel line material and its surface area (shall be smaller than the representative vehicle)

F. fuel tank capacity (within +10/-50% compared to representative vehicle)

G. set value of fuel storage pressure (shall not be lower than the representative vehicle)

H. vapor storage method (canister, storage material and air filter)

I. carbon canister capacity (shall not be smaller than the representative vehicle)

J. vapor purge method (air circulation, purge capacity during a cycle)

K. method of seals and circulation in fuel system

6. To be classified in the same durability family, vehicles must be similar with respect to

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the items listed below:

A. Equivalent inertial weight (not exceeding the inertia weight in two highest groups)

B. Road load power (80km/h, +5% or less)

C. Engine displacement (±15%)

D. Control method and numbers of intake and exhaust valves

E. Fuel system

F. Engine cooling system

G. Engine combustion method

H. Catalytic converter and DPF

(1) Type, Number, Capacity (±10%), Location

(2) Amount of precious metal (equivalent or more), Composition and ratio (±15%)

(3) Casing (Structure, Material), Cell density

(4) Temperature change in inlet of catalytic converter (not exceeding 50K, checking the temperature under the certification test and stabilized condition in 120km/h)

I. Air injection equipped or not and its type

J. EGR equipped or not and it type

7. Whether or not vehicles are classified in the same model family according to Item 1 through Item 3, the vehicle shall be classified as a new model if it is a used car being imported.

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[Table 2]

Scope of OBD family (Article 2 Item 2)

1. combustion process
2. method of engine fuelling (carburetor or fuel injection)
3. type of catalytic converter (oxidation, three-way, heated catalyst, other)
4. type of particulate trap
5. secondary air injection (i.e. with or without)
6. exhaust gas recirculation (i.e. with or without)
7. OBD functioning (malfunction detection method, method of malfunction light indication etc.)

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[Table 3]
Vehicles to be equipped with OBD (Article 5)

1. Gasoline fueled vehicles
   a. light-weight vehicle certified after 2006.1.1 or light-weight vehicle delivered after 2007.1.1
   b. small-sized passenger car (PC1, PC2) delivered after 2005.1.1 with a phase-in schedule below by vehicle manufacturer:

Year	2005	2006	2007
Delivery ratio	=> 10%	=> 30%	100%

   c. mid-sized PC, small-sized truck and mid-sized truck certified after 2006.1.1, or mid-sized PC, small-sized truck and mid-sized truck delivered after 2007.1.1
   d. large-sized PC, extra large-sized PC, large-sized truck and extra large-sized truck certified after 2009.1.1, or large-sized PC, extra large-sized PC, large-sized truck and extra large-sized truck delivered after 2010.1.1
2. Diesel fueled vehicles
   a. light-weight vehicle and small-sized PC certified after 2006.1.1 or light-weight vehicle and small-sized PC delivered after 2007.1.1
   b. mid-sized PC, small-sized truck and mid-sized truck certified after 2007.1.1, or mid-sized PC, small-sized truck and mid-sized truck delivered after 2008.1.1
   c. large-sized PC, extra large-sized PC, large-sized truck and extra large-sized truck certified after 2009.1.1, or large-sized PC, extra large-sized PC, large-sized truck and extra large-sized truck delivered after 2010.1.1
3. Gaseous fueled vehicles
   a. light-weight vehicle, small-sized PC, small-sized truck, mid-sized PC and mid-sized truck certified after 2012.1.1, or small-sized PC, small-sized truck, mid-sized PC and mid-sized truck delivered after 2014.1.1 and light-weight vehicle after 2016.1.1.
   b. large-sized PC, large-sized truck, extra large-sized PC and extra large-sized truck certified after 2011.1.1, or large-sized PC, large-sized truck, extra large-sized PC and extra large-sized truck delivered after 2012.1.1
4. Two-wheeled vehicles
   a. two-wheeled vehicle with a max speed not less than 45km/h, among those with a displacement of 50cc or more for which the application is applied after 2017.1.1 and two-wheeled vehicle with a max speed not less than 45km/h, among those with a displacement of 50cc or more delivered after 2018.1.1.

b. two-wheeled used vehicle imported after 2018.1.1 and two-wheeled vehicle with a max speed not less than 45km/h, among those with a displacement of 50cc or more which are imported from non-vehicle manufacturer.

Remark:

1. AEPA Enforcement Regulations Table 5 and Table 17 shall apply for vehicle classification and classification of fuel.
2. For the delivery ratio of gasoline- small-sized PC any surplus over the delivery ratio, if any, shall be carried over to the next year, and for any deficit below the ratio the deficit ratio shall be doubled and added to the ratio for the next year. However, before 2004.12.31 if the manufacturer voluntarily builds and delivers vehicles equipped with OBD those units shall be acknowledged as the delivery quantity for 2005. For a manufacturer whose annual sales volume of the gasoline- small-sized PC is not more than 10,000 units, 50% or more may be applied in 2007, 75% or more in 2008 and 100% in 2009, and for a manufacturer whose annual sales volume is not more than 1,000 units, 100% may be applied in 2009.
3. For imported used cars of gasoline- small-sized PC pursuant to Article 6 and gasoline-small-sized PC imported from a party other than a manufacturer, 100% may be applied at the final year of the phase-in period.
4. For small-sized PC whose GVW exceeds 2.5 tons the standards for mid-sized PC, small-sized truck and mid-sized truck shall apply.
5. The standards at the time of manufacture shall apply to vehicles which have been confirmed to be manufactured before the application date shown in Item 1 for gasoline vehicles or in Item 2 for diesel vehicles and which are delivered within 90 days from the application date shown in Item 1 for gasoline vehicles or in Item 2 for diesel vehicles.
6. The standards at the time of manufacture shall apply to the diesel fueled vehicles which have been confirmed as manufactured before the application date shown in Item 2 which are delivered within 180 days from the application date in case of Item 2.c, and the standards at the time of manufacture shall apply to vehicles which have been confirmed as manufactured before the application date shown in Item 3 for gaseous fueled vehicles and which are delivered within 90 days from the application date in case of Item 3.a or delivered within 180 days from the application date in case of Item 3.b.
7. In case that the OBD test method pursuant to Article 5 of the Regulations for Test Procedure of Manufactured Motor vehicles has been revised, the test method at the time of manufacture shall apply to vehicles which are delivered within 90 days from the application date. However, in the case of large, extra-large sized vehicles and large, extra-large sized trucks, the emission standard test method at the time of manufacture shall

apply to vehicles which are delivered within 180 days from the application date.

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[Table 3-2]
Special provisions for vehicles to be equipped with OBD (Article 5)

1. In case of gasoline fueled vehicles imported from manufacturers in the EU region which are applied by Table 15-2 (Special Provisions for OBD test method for gasoline fueled motor vehicles) pursuant to Article 5 Item 1 of the Regulations for Test Procedure of Manufactured Motor Vehicles, vehicles equipped with Euro 6 OBD may be imported from 2014 (or earlier if ready), and vehicles equipped with Euro 5 OBD may be imported according to the following scheme:

A. each manufacturer whose sales of vehicles with Euro OBD during the year 2008 exceeded 800 vehicles will be allowed to sell the following number of vehicles; the year 2010: 1,200, the year 2011: 1,500, the year 2012: 1,800 and the year 2013: 1,800;

B. each manufacturer whose total sales of vehicles with Euro OBD during the year 2005 to 2008 exceeded an average of 750 vehicles per year will be allowed to sell 1,000 vehicles per year and brand; and

C. other manufacturers not covered under subparagraphs A or B above will be allowed to sell vehicles within an overall limit of 1,500 such vehicles per year. This quantity will be distributed among those manufacturers in accordance with principles to be determined by the Working Group on Motor Vehicles and Parts.

2. In the event that the ratification of the Korea-EU FTA is delayed past the year of application, the quantity for the corresponding year will be deducted from the quantity for the following year.

3. The following quantity applies to individual vehicles subject to the special provisions imported from a party who is not a vehicle manufacturer. In this case, it shall be based on the date of certificate or certificate for omission.

Year	2010	2011	2012	2013	2014	Remark
Quantity	6,700	7,000	7,300	7,300	-	Type I OBD: Euro 5 OBD
	-	-	-	-	All vehicles	Type II OBD: Euro 6 OBD

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[Table 4]

Documentation of Application for Exhaust Emission and Noise Certification (Article 7 Clause 2)

No.	Composition of Application for Certification	Form No.
1	Emission System Information Sheet(ESIS)	1
2	Vehicle Information Data Sheet(VIDS)	2
3	Noise System Information Sheet	3
4	Details	4
5	Emission/Noise Test Reports	
	5-1 Mfr's Durability Test Data Sheet(MTDS)	14
	5-2 Emission Test Analysis Report	15-21
	5-3 Evaporative Emission Test Report	23
	5-4 Noise Test Report	27 thru 27-2
6	Manufacturer's Emission Warranty Certificate or the contract between the manufacturer or importer (which shall include the mfr's obligation for the manufactured vehicles and in-use vehicles with regards to the emission standards and performance of the related parts during the warranty period pursuant to Article 48 and Article 51 of the AEPA and together with the contract between the manufacturer and a dealer for parallel importation. In this case, the requirement may be replaced by the certificate specified in Article 8.)	* In the event that a copy of the contract is submitted, the original contract shall be shown to the Administrator for confirmation.

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[Table 4-2]
Documentation of Application for Exhaust Emission and Noise Certification for Electric Vehicle (Article 7 Clause 3)

No.	Composition of Application for Certification	Form No.
1	Documents regarding the detailed plan necessary for the certification	4-2
5	Emission/Noise Test Reports 2-1 Driving range test report with full charge 5-4 Noise test Report	 15-2 27, 27-2
6	Manufacturer's Emission Warranty Certificate or the contract between the manufacturer or importer (which shall include the mfr's obligation for the manufactured vehicles and in-use vehicles with regards to the emission standards and performance of the related parts during the warranty period pursuant to Article 48 and Article 51 of the AEPA and together with the contract between the manufacturer and a dealer for parallel importation.) In this case, the requirement may be replaced by the certificate specified in Article 8.	* In the event that a copy of the contract is submitted, the original contract shall be shown to the Administrator for confirmation.

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[Table 5]

Documentation of Application for Two-Wheeled Motor Vehicle Exhaust Emission and Noise Certification (Article 7 Clause 3)

No.	Composition of Application for Certification	Form No.
1	Documents regarding the detailed plan necessary for the certification	4
2	Emission and noise reduction measures	5
3	Emission test report	18, 18-2
4	Noise test report	27, 27-2
5	Evaporative test report	23
6	Manufacturer's Emission Warranty Certificate or the contract between the manufacturer or importer (which shall include the mfr's obligation for the manufactured vehicles and in-use vehicles with regards to the emission standards and performance of the related parts during the warranty period pursuant to Article 48 and Article 51 of the AEPA and together with the contract between the manufacturer and a dealer for parallel importation.) In this case, the requirement may be replaced by the certificate specified in Article 8 Clause 3.	* In the event that a copy of the contract is submitted, the original contract shall be shown to the Administrator for confirmation.

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[Table 5-2]

Documentation of Application for Two-Wheeled Electric Vehicle Exhaust Emission and Noise Certification (Article 7 Clause 3)

No.	Composition of Application for Certification	Form No.
1	Documents regarding the detailed plan necessary for the certification	4-2 Item 1
2	Tet facility and measurement device (if submitting in-house test report)	4-2 Item 3
3	Emission label	4-2 Item 6
4	Main components of electric vehicle	4-2 Item 7
5	Emission and noise reduction measures for two-wheeled EV	5 Item 6
6	Driving range test report with full charge (if submitting in-house test report)	18-2
7	Noise test report(if submitting in-house test report)	27, 27-2
8	Manufacturer's Emission Warranty Certificate or the contract between the manufacturer or importer (which shall include the mfr's obligation for the manufactured vehicles and in-use vehicles with regards to the emission standards and performance of the related parts during the warranty period pursuant to Article 48 and Article 51 of the AEPA and together with the contract between the manufacturer and a dealer for parallel importation.) In this case, the requirement may be replaced by the certificate specified in Article 8 Clause 3.	* In the event that a copy of the contract is submitted, the original contract shall be shown to the Administrator for confirmation.

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[Table 6]

(deleted 09.01.05)

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[Table 7]

Documentation of Application for OBD and Emission Reduction Devices (Article 7 Clause 3)

1. OBD

Composition of Application for Certification		Form No.
No.	Contents	
01.00.00	OBD general information	9
02.00.00	OBD family	
03.00.00	Test vehicle selection	

2. Emission Reduction Devices (except two-wheeled vehicle)

Composition of Application for Certification		Form No.
No.	Contents	
01.00.00	General information	10
02.00.00	Operating theory and mechanism	

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[Table 8]

Format and Binding of Application for Certification (Article 7 Clause 2)

Filing shall be as below:

	Company Name	Exhaust Emission Certification
	Certification No. 0 0 1.5LPG	(xx Company 1.5LPG) 1998
	98.10	

A detailed index shall appear on the first page and each page shall bear the page number at the center of the bottom area.

Binder size: A4-S-2

A4(210 x 290mm) papers shall be used with a page number and model family code marked on each page.

Each section shall be clearly identified by a number:
01.00.00 Introduction
01.01.00 Descriptions about the Application for Certification
01.01.01

Language used shall be Korean, and together with an English in (ex, 삼원촉매 (3way Catalyst)) for technical terms. Any foreign documents submitted shall also be translated.

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[Table 9]

Format and Binding of Application for OBD Certification(Article 7 Clause 2)

Filing shall be as below:

	Company Name	OBD Certification
	Certification No. 0 0 1.5LPG	(xx Company 1.5LPG) 1998
	98.10	

A detailed index shall appear on the first page and each page shall bear the page number at the center of the bottom area.

Binder size: A4-S-2

A4(210 x 290mm) papers shall be used with a page number and model family code marked on each page.

Each section shall be clearly identified by a number:
01.00.00 Certification documentation
01.01.00 OBD general description
01.01.01

Language used shall be Korean, and together with an English in (ex, 삼원촉매 (3way Catalyst)) for technical terms. Any foreign documents submitted shall also be translated.

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[Table 10]
Evaluation of Certification Application Documents (Article 7 Clause 5)

(not translated – not applicable to applicants)

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[Table 11]

Documentation of Application for Exhaust Emission and Noise Certification for Individual Vehicle (Article 8 Clause 7)

Composition of applications for certification		Form No.
No.	Details	
01.00.00	Detailed specifications	11 (motor vehicle) 12 (two-wheeled motor vehicle)
02.00.00	Emission warranty	* In the event that a copy of the contract is submitted, the original contract shall be shown to the Administrator for confirmation.
03.00.00	Test data of the testing agency (including the data for OBD)	

Remark:

1. The availability of OBD may be confirmed by submitting data, such as copy or photograph of service manual or emission label which shows On-Board Diagnostic or OBD, along with the VIN and fuel used.
2. Manufacturer's confirmation certificate on OBD shall be the one issued by the manufacturer which includes VIN and fuel used.
3. The OBD certification level shall also be stated in the manufacturer's confirmation certificate.

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[Table 12]
Documentation of Application for Omission of Certification (Article 8 Clause 7)

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~~[Table 12-2]~~

~~Selection of test vehicles for omission of certification of two-wheeled motor vehicles (Article 8 Clause 11)~~

(deleted)

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[Table 13]

Items Subject to Test for Modification of Certification (Article 9 Clause 1)

1. Emission (in case emission related component(s) specified in Table 20 of the AEPA Regulation is(are) changed)

2. Noise

A. change of power train(gear ratio, reduction ratio, number of axles)
B. change of silencer in terms of volume, material, structure)
C. change of max. output or change of rpm at max. output
D. increase of curb weight by 30% or more
E. change of parts relating to noise control system

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[Table 13-2]

Selection of test vehicles for individual certification (Article 13 Clause 2)

No. of units custom cleared		21 - 50	51 - 100	101 - 300	301 – 500
No. of test vehicles	≥ 50cc	3	4	5	6
	< 50cc	2	3	4	5

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[Table 14]

Durability Driving Schedule (Article 14 Clause 1)

1. Basic durability driving schedule

a. Basic durability driving schedule may apply to all small-sized vehicles.

b. Driving Schedule

1) The schedule consists basically of 9 laps, and during each lap accelerations and decelerations without cruising are repeated.

2) The top speed (km/h), average speed(km/h), driving distance(km) and driving time(sec.) are shown in Table below and the detailed driving schedule is shown in Figure below. The first five laps represent city and major routes driving with a top speed of 98.8km/h, an average speed of 66.2km/h for 1,135 seconds. The 6th lap through the 9th lap represent highway driving with a top speed of 133.1km/h, an average speed of 100.6km/h for 2,307 seconds.

3) If the maximum speed of a test vehicle is less than the top speed in the table, the vehicle shall be driven at the maximum speed in that particular lap.

Lap	Top Speed (km/h)	Average Speed (km/h)	Distance (km)	Time (Seconds)
1	91.6	60.2	3.5	211
2	82.1	64.1	3.0	166
3	98.8	71.1	5.2	264
4	70.0	52.7	3.2	218
5	97.8	77.7	6.0	276
6	132.8	112.5	27.9	892
7	113.4	83.5	2.8	123
8	133.1	108.6	25.8	857
9	98.3	65.4	7.9	435

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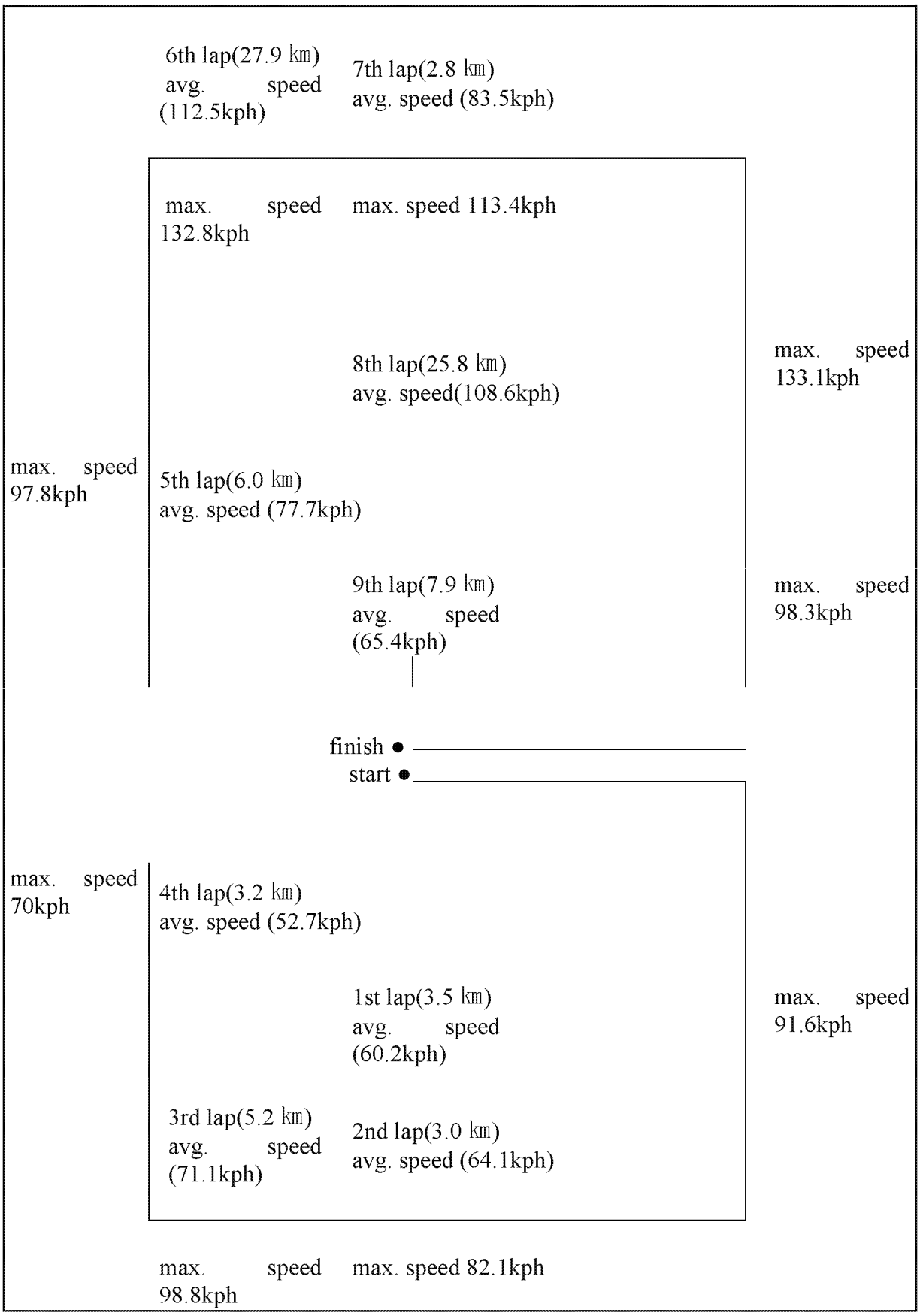
6th lap(27.9 km)
avg. speed (112.5kph)
7th lap(2.8 km)
avg. speed (83.5kph)
max. speed 132.8kph
max. speed 113.4kph
8th lap(25.8 km)
avg. speed(108.6kph)
max. speed 133.1kph
max. speed 97.8kph
5th lap(6.0 km)
avg. speed (77.7kph)
9th lap(7.9 km)
avg. speed (65.4kph)
max. speed 98.3kph
finish
start
max. speed 70kph
4th lap(3.2 km)
avg. speed (52.7kph)
1st lap(3.5 km)
avg. speed (60.2kph)
max. speed 91.6kph
3rd lap(5.2 km)
avg. speed (71.1kph)
2nd lap(3.0 km)
avg. speed (64.1kph)
max. speed 98.8kph
max. speed 82.1kph

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c. Driving requirements

1) In the 1st lap there are 3 accelerations up to the top speed and one long deceleration(38km/h), and at the top speed there are 2 decelerations(33, 40km/h) and 1 acceleration(81km/h).
2) In the 2nd lap there are 3 long accelerations(68, 80, 65km/h) up to the top speed and 3 long decelerations(30, 28, 28km/h) until the lap finishes.
3) In the 3rd lap there is one long acceleration up to the top speed, followed by repeated deceleration and acceleration down to 78km/h, and one long deceleration from 78km/h down to 28km/h.
4) In the 4th lap there are 5 long accelerations(70, 63, 61, 59, 64km/h) and 5 long deceleration(26, 25, 23, 30, 28km/h).
5) In the 5th lap there are 4 long deceleration(90, 93, 98, 84km/h) and 4 long deceleration(30, 66, 31, 30km/h).
6) In the 6th lap there is 1 acceleration up to the top speed, followed by repeated deceleration and acceleration down to 120km/h, and one deceleration(26km/h) from 120km/h.
7) In the 7th lap there are 2 long accelerations(73, 113km/h) up to the top speed and 1 short deceleration(89km/h). At the top speed there are 2 short decelerations and 1 long deceleration(32km/h).
8) In the 8th lap there are 4 long accelerations(over 100km/h) and 4 long deceleration(37km/h).
9) In the 9th lap there are 6 long accelerations and 6 decelerations followed by a stop.

2. SRC durability driving schedule

a. SRC durability driving schedule may apply to all small-sized vehicles.

b. The cycle consists of 7 laps of a 6 km course according to following Table. The length of the lap may be changed to accommodate the length of the mileage accumulation test track.

Lap	Description	Typical acceleration rate (m/s^2)
1-1	(start engine) idle 10 seconds	0
1-2	Moderate acceleration to 48 km/h	1.79
1-3	Cruise at 48 km/h for 1.5km(¼ lap)	0

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1-4	Moderate deceleration to 32 km/h	-2.23
1-5	Moderate acceleration to 48 km/h	1.79
1-6	Cruise at 48 km/h for 1.5km(¼ lap)	0
1-7	Moderate deceleration to stop	-2.23
1-8	Idle 5 seconds	0
1-9	Moderate acceleration to 56 km/h	1.79
1-10	Cruise at 56 km/h for 1.5km(¼ lap)	0
1-11	Moderate deceleration to 40 km/h	-2.23
1-12	Moderate acceleration to 56 km/h	1.79
1-13	Cruise at 56 km/h for 1.5km(¼ lap)	0
1-14	Moderate deceleration to stop	-2.23
2-1	idle 10 seconds	0
2-2	Moderate acceleration to 64 km/h	1.34
2-3	Cruise at 64 km/h for 1.5km(¼ lap)	0
2-4	Moderate deceleration to 48 km/h	-2.23
2-5	Moderate acceleration to 64 km/h	1.34
2-6	Cruise at 64 km/h for 1.5km(¼ lap)	0
2-7	Moderate deceleration to stop	-2.23
2-8	Idle 5 seconds	0
2-9	Moderate acceleration to 72 km/h	1.34
2-10	Cruise at 72 km/h for 1.5km(¼ lap)	0
2-11	Moderate deceleration to 56 km/h	-2.23
2-12	Moderate acceleration to 72 km/h	1.34
2-13	Cruise at 72 km/h for 1.5km(¼ lap)	0
2-14	Moderate deceleration to stop	-2.23
3-1	idle 10 seconds	0
3-2	Hard acceleration to 88 km/h	1.79
3-3	Cruise at 88 km/h for 1.5km(¼ lap)	0

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3-4	Moderate deceleration to 72 km/h	-2.23
3-5	Moderate acceleration to 88 km/h	0.89
3-6	Cruise at 88 km/h for 1.5km(¼ lap)	0
3-7	Moderate deceleration to 72 km/h	-2.23
3-8	Moderate acceleration to 97 km/h	0.89
3-9	Cruise at 97 km/h for 1.5km(¼ lap)	0
3-10	Moderate deceleration to 80 km/h	-2.23
3-11	Moderate acceleration to 97 km/h	0.89
3-12	Cruise at 97 km/h for 1.5km(¼ lap)	0
3-13	Moderate deceleration to stop	-1.79
4-1	idle 10 seconds	0
4-2	Hard acceleration to 129 km/h	1.34
4-3	Coastdown to 113 km/h	-0.45
4-4	Cruise at 113 km/h for 3.0km(½ lap)	0
4-5	Moderate deceleration to 80 km/h	-1.34
4-6	Moderate acceleration to 105 km/h	0.89
4-7	Cruise at 105 km/h for 3.0km(½ lap)	0
4-8	Moderate deceleration to 80 km/h	-1.34
5-1	Moderate acceleration to 121 km/h	0.45
5-2	Cruise at 121 km/h for 3.0km(½ lap)	0
5-3	Moderate deceleration to 80 km/h	-1.34
5-4	Light acceleration to 113 km/h	0.45
5-5	Cruise at 113 km/h for 3.0km(½ lap)	0
5-6	Moderate deceleration to 80 km/h	-1.34
6-1	Moderate acceleration to 113 km/h	0.89
6-2	Coastdown to 97 km/h	-0.45
6-3	Cruise at 97 km/h for 3.0km(½ lap)	0
6-4	Moderate deceleration to 80 km/h	-1.79

6-5	Moderate acceleration to 104 km/h	0.45
6-6	Cruise at 104 km/h for 3.0km(½ lap)	0
6-7	Moderate deceleration to stop	-1.79
7-1	idle 45 seconds	0
7-2	Hard acceleration to 88 km/h	1.79
7-3	Cruise at 88 km/h for 1.5km(¼ lap)	0
7-4	Moderate deceleration to 64 km/h	-2.23
7-5	Moderate acceleration to 88 km/h	0.89
7-6	Cruise at 88 km/h for 1.5km(¼ lap)	0
7-7	Moderate deceleration to 64 km/h	-2.23
7-8	Moderate acceleration to 80 km/h	0.89
7-9	Cruise at 80 km/h for 1.5km(¼ lap)	0
7-10	Moderate deceleration to 64 km/h	-2.23
7-11	Moderate acceleration to 80 km/h	0.89
7-12	Cruise at 80 km/h for 1.5km(¼ lap)	0
7-13	Moderate deceleration to stop	-2.23

3. Durability driving schedule for diesel vehicles

a. The durability driving schedule for diesel vehicles may apply to small-sized PC fueled by Diesel.

b. Driving schedule

1) The durability test schedule is composed of 11 cycles covering 6 kilometers each,
2) The maximum speed for each cycle is specified in the table below and the detailed driving schedule is as following figure.
3) During the first thru ninth cycles, the vehicle is stopped four times in the middle of the cycle, with the engine idling each time for 15 seconds,
4) Five decelerations in the middle of each cycle, dropping from cycle speed to 32 km/h, and the vehicle is gradually accelerated again until cycle speed is attained,
5) The 10th cycle is carried out at a steady speed of 89 km/h,
6) The 11th cycle begins with maximum acceleration from stop point up to 113 km/h. At half-way, braking is employed normally until the vehicle comes to a stop. This is followed by an idle period of 15 seconds

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Cycle	Max speed (km/h)
1	64
2	48
3	64
4	64
5	56
6	48
7	56
8	72
9	56
10	89
11	113

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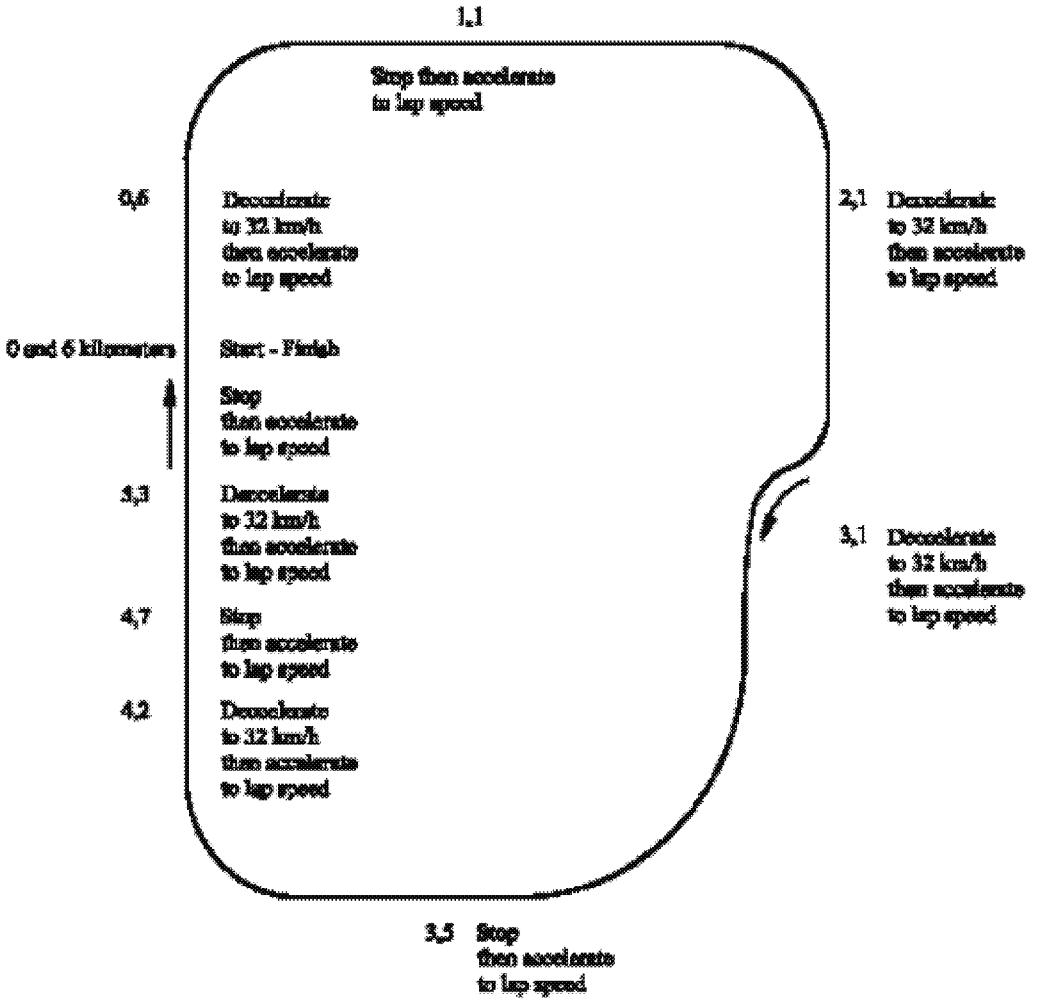
1,1
Stop then accelerate
to lap speed
0,6
Decelerate
to 32 km/h
then accelerate
to lap speed
2,1
Decelerate
to 32 km/h
then accelerate
to lap speed
0 and 6 kilometers
Start - Finish
Stop
then accelerate
to lap speed
3,3
Decelerate
to 32 km/h
then accelerate
to lap speed
3,1
Decelerate
to 32 km/h
then accelerate
to lap speed
4,7
Stop
then accelerate
to lap speed
4,2
Decelerate
to 32 km/h
then accelerate
to lap speed
3,5
Stop
then accelerate
to lap speed

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[Table 14-2]

Durability Driving Schedule (Article 14 Clause 1) for two-wheeled vehicle
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[Table 15]

Scope of service items (Article 18 Clause 1)

1. ignition system
2. cold start enrichment system
3. idle speed and air-fuel mixture rate
4. drive belt tension
5. valve spacing
6. intake-exhaust control valve
7. torque of bolt mounted on engine
8. spark plug and ignition timing
9. fuel filter and air filter
10. crankcase emission control system
11. evaporative emission system
12. injection timing adjustment
13. governor adjustment
14. fuel injector nozzle cleaning and service
15. fuel injection system
16. engine and gearbox oil
17. oil filter

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[Table 16]

Assigned DF (Article 21)

1. Gasoline, alcohol or gas fueled vehicles (including bi-fuel/dual-fuel vehicles fueled by gasoline, alcohol, or gas, and electric vehicles fueled by gasoline or gas as a supplementary motive power)

Warranty period / Pollutant	GVW < 3.5 tons				GVW >= 3.5 tons
	100,000km	160,000km	192,000km	240,000km	
CO	1.2	1.4	1.5	1.6	1.2(1.1)(1.3)*
Tailpipe HC	1.2	1.3	1.4	1.5	1.2(1.05)(1.4)*
Methane	-	-	-	-	(1.4)*
Evaporative HC	0.1(0.2)	0.2(0.25)	0.25(0.3)	0.3(0.35)	-
NOx	1.1	1.4	1.5	1.6	1.0(1.05)(1.15)*

Remark:

1. DFs in ( ) applies to vehicles governed by Table 17 sub-para.1.F of the AEPA Regulation and DF in ( )* applies to vehicles governed by Table 17 sub-para.1.G of the APEA Regulation.
2. Assigned DFs for 100,000km shall be used for vehicles with warranty period of 100,000km or less.
3. DF shall be '0' for the vehicle for which evaporative HC standard is 0.35g/test or less.

2. Diesel fueled vehicles(including bi-fuel/dual-fuel vehicles and electric vehicles fueled by diesel as a supplementary motive power)

Warranty period / Pollutant	GVW < 3.5 tons		GVW >= 3.5 tons
	80,000km	160,000km	
CO	1.1	1.5	1.2(1.1)(1.3)*
Tailpipe HC	-	-	1.2(1.05)(1.3)*
NOx	1.0	1.1	1.0(1.05)(1.15)*
particulate matter (PM)	1.2	1.0	1.1(1.05)*
particulate number (PN)	1.0	1.0	1.0
NOx + tailpipe HC	1.0	1.1	-

Remark:

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1. Bi-fuel/dual-fuel vehicles and electric vehicles fueled by diesel as a supplementary motive power shall be included.
2. DFs for vehicles with GVW less than 3.5 tons shall not apply to vehicles governed by Table 17 sub-para.2. G of the AEPA Regulation
3. DFs in ( ) applies to vehicles governed by Table 17 sub-para.2.F of the AEPA Regulation and DF in ( )* applies to vehicles governed by Table 17 sub-para.2.G of the AEPA Regulation.

3. Two-wheeled vehicle

Gas	Two-wheeled vehicle
CO	1.3(1.3)
Tail pipe HC	1.2(1.3)
NOx	1.2(1.3)
PM	1.1(1.0)
Evaporative HC	0.3(0.3)

Remark

DF applies to vehicles governed by Table 17 sub-para.3. D of the AEPA Regulation and DF in ( ) applies to vehicles governed by Table 17 sub-para.3.E of the AEPA Regulation.

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[Table 17]

Bench Aging for Emission Related Components (Article 22)

1. General
   (1) The bench aging procedure is applicable to gasoline or gas fueled vehicles.
   (2) The bench aged components mean a catalyst and an oxygen sensor.
   (3) Exhaust gas is used as the source for bench aging.

2. Aging bench equipment
   (1) The aging bench consists of an engine, engine controller, and engine dynamometer.
   (2) The aging bench must provide the appropriate exhaust flow rate, temperature, air-fuel ratio, exhaust constituents and secondary air injection at the inlet face of the catalyst.
   (3) A single aging bench may have the exhaust flow split into several streams so that multiple catalyst-oxygen-sensor systems may be aged simultaneously.
   (4) The entire catalyst(s)-plus-oxygen-sensor(s) system will be installed on the bench. However, each catalyst-oxygen-sensor system may be aged separately if a manufacturer controls exhaust flow and temperature separately in consideration of the actual driving conditions.

3. Standard bench cycle (SBC)
   A. Composition of SBC
   (1) The SBC is composed as follows:

Lap	Time (sec.)	A/F ratio	Temp. condition	Secondary air injection
1	1-40	Stoichiometric	Load, spark timing, and engine speed controlled to achieve a minimum catalyst temperature	None
2	41-45	Rich	A/F ratio selected to achieve 90°C higher than low control temperature	None
3	46-55	Rich	A/F ratio selected to achieve 90°C higher than low control temperature	3% (+-0.1%)
4	56-60	stoichiometric	Load, spark timing, and engine speed controlled to achieve a minimum catalyst temperature	3% (+-0.1%)

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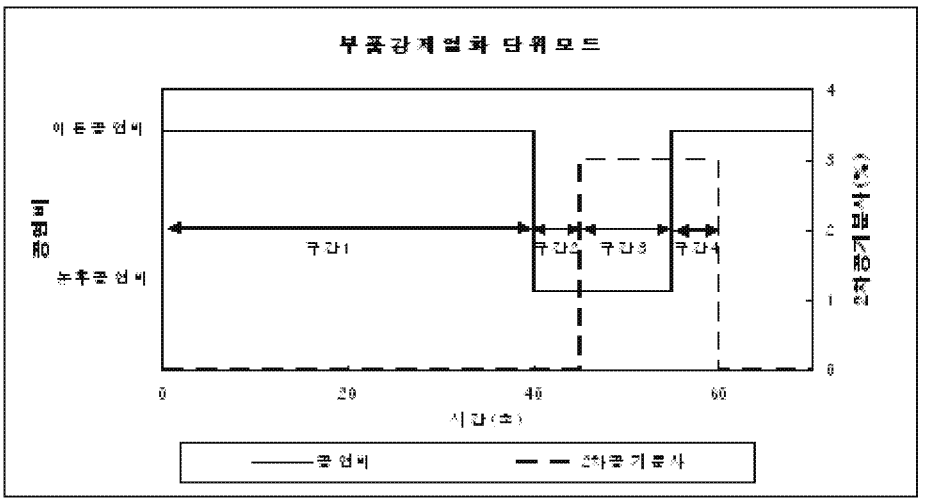

(2) The SBC is repeated as necessary on the aging bench to conduct aging for the required period of time calculated according to sub-para. 4.

B. Aging procedures

(1) The temperature of exhaust during aging shall be controlled within +-10°C of the temperature required in each lap shown in A(1).

(2) Care should be taken to assure that the maximum catalyst temperature for rapid deterioration does not occur during startup or shutdown. Special low temperature startup and shutdown procedures may be used to alleviate this concern.

(3) The temperatures and A/F ratio information shall be reviewed periodically every 50 hours during aging. Necessary adjustments shall be made to assure that the SBC is being appropriately followed throughout the aging process.

(4) The proper flow rate is determined based upon the exhaust flow that would occur in the original vehicle's engine at the steady state engine speed and load selected for the bench aging. The flow rate is measured in grams/second at stoichiometry, with a tolerance of +-5 grams/second.

(5) Catalyst temperature shall be measured using a thermocouple placed in the catalyst bed at the location where the highest temperature occurs in the hottest catalyst and stored at the speed of 1Hz. Alternatively, the feed gas temperature just before the catalyst inlet face may be measured and converted to catalyst bed temperature using a linear transform calculated from manufacturer's data.

(6) Provisions must be made for the measurement of the A/F ratio (such as a wide-range oxygen sensor) as close as possible to the catalyst inlet and outlet flange. The information from these sensors must be stored at the speed of 1Hz.

(7) After the aging has been completed, the catalyst time-at-temperature collected during the aging process shall be tabulated into a histogram with temperature bins of no larger

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than 10°C.

4. Bench aging conditions

A. Catalyst temperature information

(1) The catalyst temperature shall be measured according to sub-para. 3.B.(5)

(2) Catalyst temperature data is measured during at least two replicates of the standard road cycle (SRC). If the maximum speed of a test vehicle is less than the top speed in the table, the vehicle shall be driven at the maximum speed in that particular lap.

(3) The temperature results are tabulated into a histogram with temperature bins of no larger than 25°C.

Description of the SRC

Lap	Description	Typical accel rate (m/s^2)
1-1	(start engine) Idle 10 sec	0
1-2	Mod accel to 48km/h	1.79
1-3	Cruise at 48km/h for 1.5km (1/4 lap)	0
1-4	Mod decel to 32km/h	-2.23
1-5	Mod accel to 48km/h	1.79
1-6	Cruise at 48km/h for 1.5km (1/4 lap)	0
1-7	Mod decal to stop	-2.23
1-8	Idle 5 sec	0
1-9	Mod accel to 56km/h	1.79
1-10	Cruise at 56km/h for 1.5km (1/4 lap)	0
1-11	Mod decel to 40km/h	-2.23
1-12	Mod accel to 56km/h	1.79
1-13	Cruise at 56km/h for 1.5km (1/4 lap)	0
1-14	Mod decal to stop	-2.23
2-1	Idle 10 sec	0
2-2	Mod accel to 64km/h	1.34
2-3	Cruise at 64km/h for 1.5km (1/4 lap)	0
2-4	Mod decel to 48km/h	-2.23
2-5	Mod accel to 64km/h	1.34
2-6	Cruise at 64km/h for 1.5km (1/4 lap)	0
2-7	Mod decal to stop	-2.23
2-8	Idle 5 sec	0

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2-9	Mod accel to 72km/h	1.34
2-10	Cruise at 72km/h for 1.5km (1/4 lap)	0
2-11	Mod decel to 56km/h	-2.23
2-12	Mod accel to 72km/h	1.34
2-13	Cruise at 72km/h for 1.5km (1/4 lap)	0
2-14	Mod decal to stop	-2.23
3-1	Idle 10 sec	0
3-2	Hard accel to 88km/h	1.79
3-3	Cruise at 88km/h for 1.5km (1/4 lap)	0
3-4	Mod decel to 72km/h	-2.23
3-5	Mod accel to 88km/h	0.89
3-6	Cruise at 88km/h for 1.5km (1/4 lap)	0
3-7	Mod decel to 72km/h	-2.23
3-8	Mod accel to 97km/h	0.89
3-9	Cruise at 97km/h for 1.5km (1/4 lap)	0
3-10	Mod decel to 80km/h	-2.23
3-11	Mod accel to 97km/h	0.89
3-12	Cruise at 97km/h for 1.5km (1/4 lap)	0
3-13	Mod decal to stop	-1.79
4-1	Idle 10 sec	0
4-2	Hard accel to 129km/h	1.34
4-3	Coastdown to 113km/h	-0.45
4-4	Cruise at 113km/h for 3.0km (1/2 lap)	0
4-5	Mod decel to 80km/h	1.34
4-6	Mod accel to 105km/h	0.89
4-7	Cruise at 105km/h for 3.0km (1/2 lap)	0
4-8	Mod decel to 80km/h	-1.34
5-1	Mod accel to 121km/h	0.45
5-2	Cruise at 121km/h for 3.0km (1/2 lap)	0
5-3	Mod decel to 80km/h	-1.34
5-4	Mod accel to 113km/h	0.45
5-5	Cruise at 113km/h for 3.0km (1/2 lap)	0
5-6	Mod decel to 80km/h	-1.34
6-1	Mod accel to 113km/h	0.89
6-2	Coastdown to 97km/h for 3.0km (1/2 lap)	-0.45
6-3	Cruise at 97km/h for 3.0km (1/2 lap)	0

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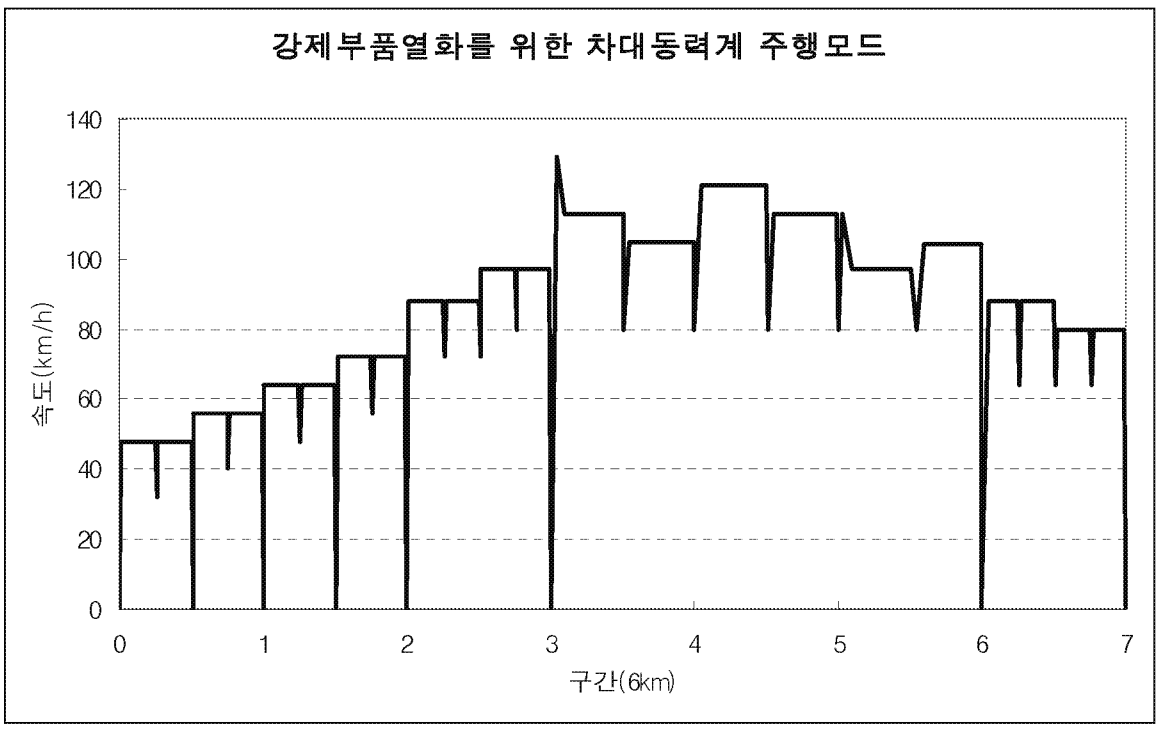
6-4	Mod decel to 80km/h	-1.79
6-5	Mod accel to 104km/h	0.45
6-6	Cruise at 104km/h for 3.0km (1/2 lap)	0
6-7	Mod decal to stop	-1.79
7-1	Idle 45 sec	0
7-2	Hard accel to 88km/h	1.79
7-3	Cruise at 88km/h for 1.5km (1/4 lap)	0
7-4	Mod decel to 64km/h	-2.23
7-5	Mod accel to 88km/h	0.89
7-6	Cruise at 88km/h for 1.5km (1/4 lap)	0
7-7	Mod decel to 64km/h	-2.23
7-8	Mod accel to 80km/h	0.89
7-9	Cruise at 80km/h for 1.5km (1/4 lap)	0
7-10	Mod decel to 64km/h	-2.23
7-11	Mod accel to 80km/h	0.89
7-12	Cruise at 80km/h for 1.5km (1/4 lap)	0
7-13	Mod decal to stop	-2.23



B. Bench aging time (BAT)

(1) The BAT is calculated using the BAT equation as follows:

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$BAT = A \times \Sigma\{t_h\, e^{((R/Tr)-(R/Tv))}\}$

where:

BAT: bench aging time

A: This value adjusts the catalyst aging time to account for deterioration from sources other than thermal aging of the catalyst

R: catalyst thermal reactivity coefficient

t_h: The time (in hours) measured within the prescribed temperature bin of the vehicle's catalyst temperature histogram adjusted to a full useful life basis.

Tr: The effective reference temperature (in °K) of the catalyst on the catalyst bench run on the bench aging cycle.

Tv: The mid-point temperature (in °K) of the temperature bin of the vehicle on-road catalyst temperature histogram.

(2) In the BAT equation A = 1.1, or a value not less than 1.0 depending on technical evaluation by a manufacturer.

(3) In the BAT equation R = 17,500, or a value calculated according to sub-para. D.

(4) In the BAT equation the initial value of Tr = 800°C, or a value depending on technical evaluation by a manufacturer.

C. Effective reference temperature on the SBC

(1) With (a) catalyst(s) installed in the aging bench equipment, catalyst temperature must be measured at a minimum rate of one hertz during at least 20 minutes of bench aging according to sub-para. 3.A.(1). The catalyst temperature shall be measured according to sub-para. 3.B.(5).

(2) The measured catalyst temperature results must be tabulated into a histogram with temperature bins of no larger than 10°C.

(3) The BAT equation must be used to calculate the effective reference temperature by iterative changes to the reference temperature (Tr) until the calculated aging time equals the actual time represented in the catalyst temperature histogram.

(4) The resulting temperature is the effective reference temperature on the SBC for that catalyst system and aging bench.

D. Catalyst thermal reactivity coefficient (R-factor)

(1) Using the applicable bench cycle and aging bench hardware, age several catalysts (minimum of 3 of the same catalyst design) at different control temperatures between the normal operating temperature and the damage limit temperature. Measure emissions for each constituent and assure that the final testing yields data between one- and two-times the standard.

(2) Estimate the value of R and calculate the effective reference temperature (Tr) for the bench aging cycle for each control temperature according to the procedure described in sub-para. C.

(3) Plot emissions (or catalyst inefficiency) versus aging time for each catalyst. Calculate the least-squared best-fit line through the data, and calculate the slope.

(4) Plot the lateral log (ln) of the slope of each best-fit line along the vertical axis, versus the inverse of aging temperature along the horizontal axis. Calculate the least-squared best-fit lines through the data. The slope of the line is the R-factor.

(5) Compare the R-factor to the initial value that was used in step (2). If the calculated R-factor differs from the initial value by more than 5%, choose a new R-factor and repeat steps (2) through (4) until the calculated R-factor is within 5% of the initially assumed R-factor.

(6) Compare the R-factor determined separately for each constituent. Use the lowest R-factor (worst case) for the BAT equation.

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[Table 17-2] Bench Aging for Emission Related Components for diesel vehicles (Artice 22)

1. General

(1) The bench aging is applicable to diesel fueled vehicles

(2) The bench aging procedure for emission related components requires the installation of the after-treatment system on an aging bench. Aging on the bench is conducted by following the standard diesel bench cycle (SDBC) for the number of regenerations / desulphurisation's calculated from the bench aging duration (BAD) equation.
Bench-Aging Duration = number of regeneration and/or desulphurisation cycles equivalent to 160,000 km of driving.

(3) Regeneration interval shall be measured during at least 10 full cycles of the standard road cycle(SRC). However, the interval from the K_i determination may be used

(4) Exhaust gas of engine is used as the source for bench aging.

(5) During durability test, the regeneration/desulphurization strategies of the system shall remain in normal operating condition

(6) Durability test with bench aging shall consist of the engine speed and load conditions that are encountered in the standard road cycle(SRC) for the period of durability. In order to shorten the process of aging, the engine settings in example fuel injection time or EGR strategy may be modified.

2. Aging bench equipment and test procedure

(1) The aging bench consists of an engine, engine controller, and engine dynamometer. Other configurations may be acceptable (e.g. whole vehicle on a dynamometer, or a burner that provides the correct exhaust conditions) as long as the after-treatment systems inlet conditions and control features are appropriate.

(2) A single aging bench may have the exhaust flow split into several streams so that multiple after-treatment systems may be aged simultaneously.

(3) The entire after-treatment system, together with all exhaust piping which connects these components, will be installed on the bench. For engines with multiple exhaust streams, each bank of the exhaust system will be installed separately on the bench.

(4) The entire after-treatment system will be defined as a unit for aging. Alternatively, each individual component may be separately aged.

3. Standard Road Cycle (SRC)

The cycle consists of 7 laps of a 6 km course as followed table. The length of each lap may be changed to accommodate the condition of the test track.

Lap	Description	Typical accel rate (m/s^2)

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1-1	(start engine) Idle 10 sec	0
1-2	Mod accel to 48km/h	1.79
1-3	Cruise at 48km/h for 1.5km (1/4 lap)	0
1-4	Mod decel to 32km/h	-2.23
1-5	Mod accel to 48km/h	1.79
1-6	Cruise at 48km/h for 1.5km (1/4 lap)	0
1-7	Mod decal to stop	-2.23
1-8	Idle 5 sec	0
1-9	Mod accel to 56km/h	1.79
1-10	Cruise at 56km/h for 1.5km (1/4 lap)	0
1-11	Mod decel to 40km/h	-2.23
1-12	Mod accel to 56km/h	1.79
1-13	Cruise at 56km/h for 1.5km (1/4 lap)	0
1-14	Mod decal to stop	-2.23
2-1	Idle 10 sec	0
2-2	Mod accel to 64km/h	1.34
2-3	Cruise at 64km/h for 1.5km (1/4 lap)	0
2-4	Mod decel to 48km/h	-2.23
2-5	Mod accel to 64km/h	1.34
2-6	Cruise at 64km/h for 1.5km (1/4 lap)	0
2-7	Mod decal to stop	-2.23
2-8	Idle 5 sec	0
2-9	Mod accel to 72km/h	1.34
2-10	Cruise at 72km/h for 1.5km (1/4 lap)	0
2-11	Mod decel to 56km/h	-2.23
2-12	Mod accel to 72km/h	1.34
2-13	Cruise at 72km/h for 1.5km (1/4 lap)	0
2-14	Mod decal to stop	-2.23
3-1	Idle 10 sec	0
3-2	Hard accel to 88km/h	1.79
3-3	Cruise at 88km/h for 1.5km (1/4 lap)	0
3-4	Mod decel to 72km/h	-2.23
3-5	Mod accel to 88km/h	0.89
3-6	Cruise at 88km/h for 1.5km (1/4 lap)	0
3-7	Mod decel to 72km/h	-2.23
3-8	Mod accel to 97km/h	0.89

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3-9	Cruise at 97km/h for 1.5km (1/4 lap)	0
3-10	Mod decel to 80km/h	-2.23
3-11	Mod accel to 97km/h	0.89
3-12	Cruise at 97km/h for 1.5km (1/4 lap)	0
3-13	Mod decal to stop	-1.79
4-1	Idle 10 sec	0
4-2	Hard accel to 129km/h	1.34
4-3	Coastdown to 113km/h	-0.45
4-4	Cruise at 113km/h for 3.0km (1/2 lap)	0
4-5	Mod decel to 80km/h	1.34
4-6	Mod accel to 105km/h	0.89
4-7	Cruise at 105km/h for 3.0km (1/2 lap)	0
4-8	Mod decel to 80km/h	-1.34
5-1	Mod accel to 121km/h	0.45
5-2	Cruise at 121km/h for 3.0km (1/2 lap)	0
5-3	Mod decel to 80km/h	-1.34
5-4	Mod accel to 113km/h	0.45
5-5	Cruise at 113km/h for 3.0km (1/2 lap)	0
5-6	Mod decel to 80km/h	-1.34
6-1	Mod accel to 113km/h	0.89
6-2	Coastdown to 97km/h for 3.0km (1/2 lap)	-0.45
6-3	Cruise at 97km/h for 3.0km (1/2 lap)	0
6-4	Mod decel to 80km/h	-1.79
6-5	Mod accel to 104km/h	0.45
6-6	Cruise at 104km/h for 3.0km (1/2 lap)	0
6-7	Mod decal to stop	-1.79
7-1	Idle 45 sec	0
7-2	Hard accel to 88km/h	1.79
7-3	Cruise at 88km/h for 1.5km (1/4 lap)	0
7-4	Mod decel to 64km/h	-2.23
7-5	Mod accel to 88km/h	0.89
7-6	Cruise at 88km/h for 1.5km (1/4 lap)	0
7-7	Mod decel to 64km/h	-2.23
7-8	Mod accel to 80km/h	0.89
7-9	Cruise at 80km/h for 1.5km (1/4 lap)	0
7-10	Mod decel to 64km/h	-2.23

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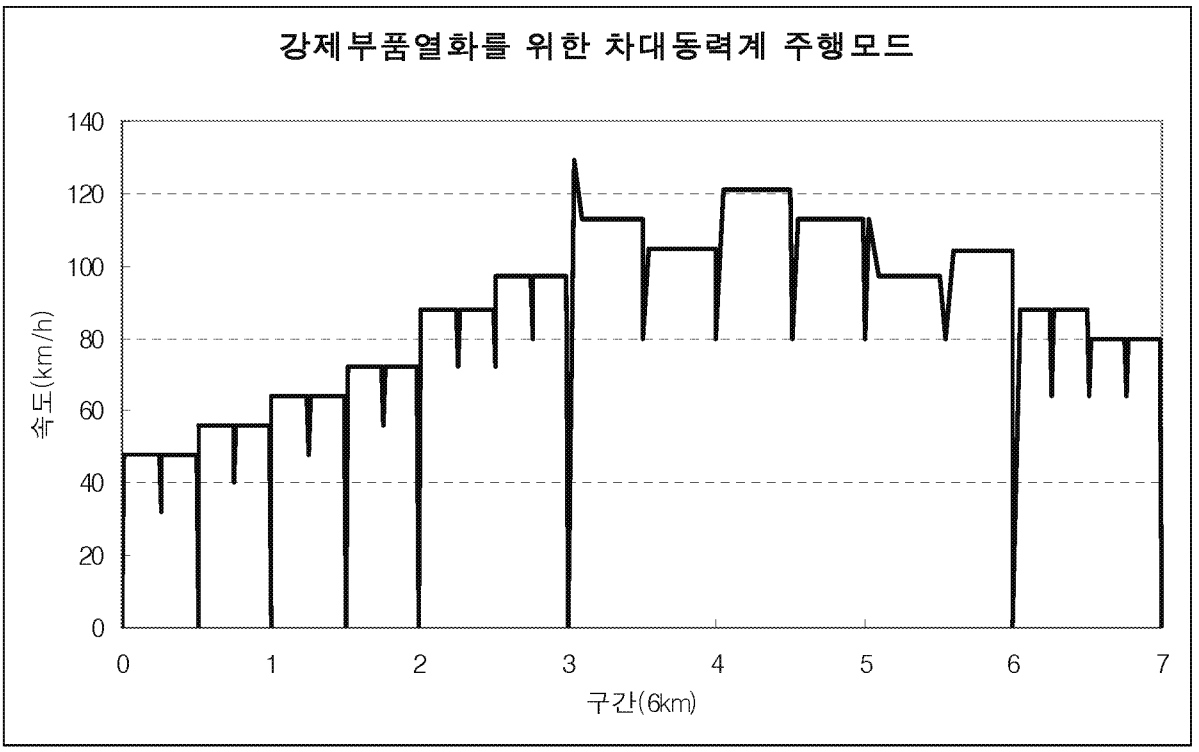
7-11	Mod accel to 80km/h	0.89
7-12	Cruise at 80km/h for 1.5km (1/4 lap)	0
7-13	Mod decal to stop	-2.23

<Standard Road Cycle>



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[Table 17-3] Emissions test procedure for a vehicle equipped with a periodically regenerating system [Artticle 27 Clause 2]

1. General

The procedure applies to diesel fueled vehicles equipped with a periodically regenerating system, provided the procedure applies to the vehicle which is measured for exhaust gas in accordance with [Table 4] of 'Regulations for Certification, Test Method and Procedure of Manufactured Motor Vehicles'.

2. Scope of certification and model family classificaiton

(1) Model family classification of vehicles with periodically regenerating system

Vehicles whose parameters described below are identical are classified with the model family of periodically regenerating system.

① Combustion process

② Periodically regenerating system (catalyst, particular trap etc.)

- construction (type of enclosure, type of precious metal, type of substrate, cell density etc.);
- type and working principle;
- dosage and additive system;
- volume ± 10 per cent;
- location (temperature ± 50 °C at 120 km/h or 5 per cent difference of maximum temperature/pressure).

(2) The periodically regeneration factors (K_i) may be extended and applied to other vehicles in the family group with a reference mass within the next two higher equivalent inertia classes or any lower equivalent inertia.

3. Test procedure

The vehicle may be equipped with a switch capable of preventing or permitting the regeneration process provided that this operation has no effect on original engine calibration. This switch shall be permitted only for the purpose of preventing regeneration during loading of the regeneration system and during the pre- conditioning cycles. However, it shall not be used during the measurement of emissions during the regeneration phase; rather the emission test shall be carried out with the unchanged manufacturer's control unit.

(1) Exhaust emission measurement between two cycles where regenerative phases occur

① Average emissions between regeneration phases and during loading of the regenerative device shall be determined from the arithmetic mean of several ECE15 and EUDC mode or equivalent engine test bench cycles. In the case the manufacturer provide data

to show that the emissions remain constant (± 15 per cent) between regeneration phases, the emissions measured during ECE15 and EUDC mode may be used. In any other case emissions measurement for at least two ECE15 and EUDC mode or equivalent engine test bench cycles must be completed (one immediately after regeneration and one as close as possible prior to a regeneration phase.)

② The loading process and Ki determination shall be made during ECE15 and EUDC mode, on a chassis dynamometer or on an engine test bench using an equivalent test cycle. These cycles may be run continuously or intermittently

③ The number of cycles (D) between two cycles where regeneration phases occur, the number of cycles over which emissions measurements are made (n), and each emissions measurement shall be recorded.

(2) Measurement of emissions during regeneration

① Preparation of vehicle, if required, may be completed using the preparation cycles of ECE15 and EUDC mode in accordance with [Table 4] of 'Regulations for Certification Test Method and Procedure of Manufactured Motor Vehicles' or equivalent engine test bench cycles, depending on the procedure in paragraph (1)-② above

② The test and vehicle conditions shall be measured according to ECE15 and EUDC mode in [Table 4] of 'Regulations for Certification Test Method and Procedure of Manufactured Motor Vehicles'.

③ Regeneration must not occur during the preparation of the vehicle. A 'dummy' regenerating system may be fitted for the pre-conditioning cycle

④ A exhaust emission test including a regeneration process shall be performed according to ECE15 & EUDC mode in [Table 4] of 'Regulations for Certification Test Method and Procedure of Manufactured Motor Vehicles' or equivalent engine test bench cycle. If the emissions tests between two cycles where regeneration phases occur are carried out on an engine test bench, the emissions test including a regeneration phase shall also be carried out on an engine test bench.

⑤ If the regeneration process requires more than one operating cycle, subsequent test cycle(s) shall be driven immediately, without switching the engine off, until complete regeneration has been achieved. The time necessary to set up a new test mode should be as short as possible. The engine must be switched off during this period.

⑥ The emission values during regeneration shall be calculated in accordance wth [Table 4] of 'Regulations for Certification Test Method and Procedure of Manufactured Motor Vehicles'. The number of operating cycles measured for complete regeneration shall be recorded.

(3) Calculation of the exhaust emissions of a single regenerative system

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1) $M_{si} = \frac{\sum_{j=1}^{n} M'_{sij}}{n}$ n≥2

2) $M_{ri} = \frac{\sum_{j=1}^{d} M'_{rij}}{d}$

3) $M_{ri} = \frac{\sum_{j=1}^{d} M'_{rij}}{d}$

Where :

M' sij = mass emissions of pollutant (i) in g/km over one operating cycle without regeneration,

M' rij = mass emissions of pollutant (i) in g/km over one operating cycle during regeneration

M si = mass emissions of pollutant (i) in g/km without regeneration,

M ri = mass emissions of pollutant (i) in g/km during regeneration,

M pi = mass emissions of pollutant (i) in g/km,

n = number of test points at which emissions measurements are made between two cycles where regenerative phases occur, ≥ 2,

d = number of operating cycles required for regeneration,

D = number of operating cycles between two cycles where regenerative phases occur.

Regeneration factor (Ki) shall be calculated from the followed formula

K i = M pi /M si

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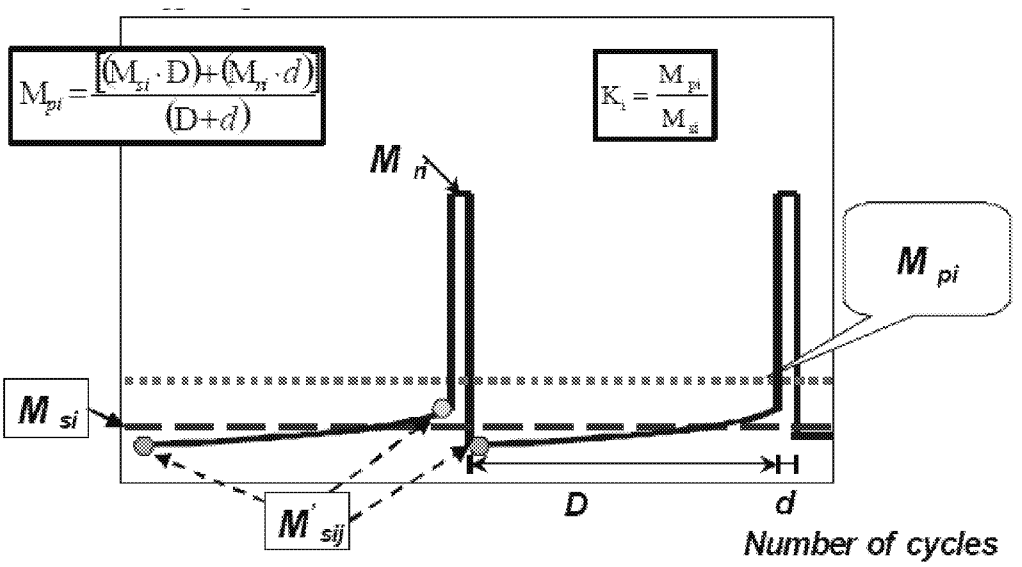
Figure 1. Illustration of measurement parameter



(4) Calculation of exhaust emissions of multiple periodic regenerating systems

1) $$M_{sik} = \frac{\sum_{j=1}^{n_k} M'_{sik,j}}{n_k} \quad n \geq 2$$

2) $$M_{rik} = \frac{\sum_{j=1}^{d_j} M'_{rik,j}}{d_j}$$

3) $$M_{si} = \frac{\sum_{k=1}^{x} M'_{sik} \cdot D_k}{\sum_{k=1}^{x} D_k}$$

4) $$M_{ri} = \frac{\sum_{k=1}^{x} M'_{rik} \cdot d_k}{\sum_{k=1}^{x} d_k}$$

5) $$M_{pi} = \frac{M_{si} \cdot \sum_{k=1}^{x} D_k + M_{ri} \cdot \sum_{k=1}^{x} d_k}{\sum_{k=1}^{x} (D_k + d_k)}$$

6) $$M_{pi} = \frac{\sum_{k=1}^{x} (M_{sik} \cdot D_k + M_{rik} \cdot d_k)}{\sum_{k=1}^{x} (D_k + d_k)}$$

7) $$K_i = \frac{M_{pi}}{M_{si}}$$

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Where,

M si = mean mass emission of all events (k) of pollutant (i) in g/km without regeneration,

M ri = mean mass emission of all events (k) of pollutant (i) in g/km during regeneration,

M pi = mean mass emission of pollutant (i) in g/km,

M sik = mean mass emission of event (k) of pollutant (i) in g/km without regeneration,

M rik = mean mass emission of event (k) of pollutant (i) in g/km during regeneration,

M′ sik,j = mass emissions of event (k) of pollutant (i) in g/km over one operating cycle without regeneration measured at point j; $1 \leq j \leq n\,k$,

M′ rik,j = mass emissions of event (k) of pollutant (i) in g/km over one operating cycle during regeneration (when j > 1, the first operation cycle is run cold, and subsequent cycles are hot) measured at operating cycle j; $1 \leq j \leq n\,k$,

n k = number of test points of event (k) at which emissions measurements are made between two cycles where regenerative phases occur, ≥ 2,

d k = number of operating cycles of event (k) required for regeneration,

D k = number of operating cycles of event (k) between two cycles where regenerative phases occur.

Figure 2. Illustration of measurement parameter

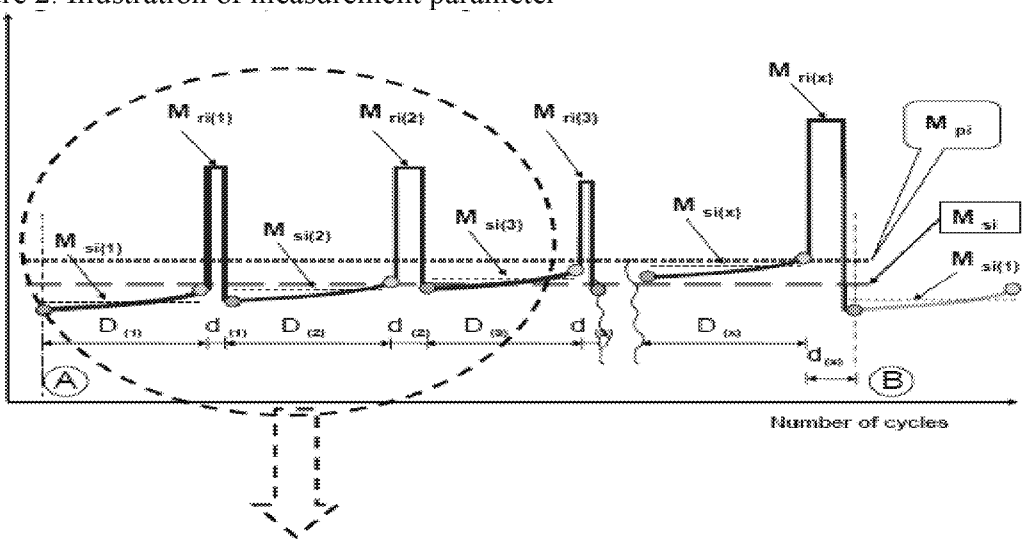

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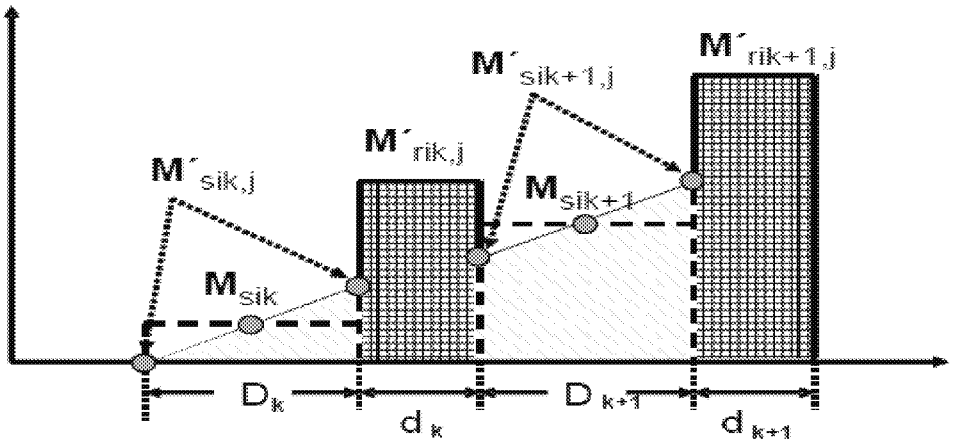
Figure 3. More details of parameter meaurment



(5)

Where, a detailed explanation above is followed

1. In case of 'DPF' with similar emissions (± 15 per cent) from regenerative event to event

$$D_k = D_{k+1} = D_1$$

$$d_k = d_{k+1} = d_1$$

$$M_{rik} - M_{sik} = M_{rik+1} - M_{sik+1}$$

2. In case of 'DeNO x 'where the desulfurisation (SO 2 removal) event is initiated before an influence of sulphur on emissions is detectable (± 15 per cent of measured emissions) and in this example for exothermic reason together with the last DPF regeneration event performed.

$$M'_{sik,\,j=1} = \text{일정} \rightarrow \quad M_{sik} = M_{sik+1} = M_{si2}$$

$$M_{rik} = M_{rik+1} = M_{ri2}$$

For SO 2 removal event: $M_{ri2}, M_{si2}, d_2, D_2, n_2 = 1$

3. Complete system (DPF+DeNOx)

$$M_{si} = \frac{n \cdot M_{si1} \cdot D_1 + M_{si2} \cdot D_2}{}$$

$$M_{ri} = \frac{n \cdot M_{ri1} \cdot D_1 + M_{ri2} \cdot D_2}{}$$

$$M_{ki} = \frac{M_{si} + M_{ri}}{n \cdot (D_1 + d_1) + D_2 + d_2} = \frac{n \cdot (M_{si1} \cdot D_1 + M_{ri1} \cdot d_1) + M_{si2} \cdot D_2 + M_{ri2} \cdot d_2}{n \cdot (D_1 + d_1) + D_2 + d_2}$$

The calculation of the factor (ki) for multiple periodic regenerating systems is only possible after a certain number of regeneration phases for each system. After performing the complete

procedure (A to B, see Figure 2), the original starting conditions A should be reached again.

① If the technical parameter(s) and or the regeneration strategy of a multiple regeneration system for all events within this combined system are changed, the multiple ki factor should be measured

② If a single device of the multiple regeneration system changed only in strategy parameters (i.e. such as 'D' and/or 'd' for DPF) and the manufacturer could present technical feasible data and information as followed, The necessary update procedure for ki could be simplified

- there is no interaction to the other device(s) of the system
- the important parameters (construction, working principle, volume, location etc.) are identical.

In such a case only a single event of sampling/storage and regeneration should be performed and the test results ('Msi ', 'Mri ') in combination with the changed parameters ('D' and/or 'd') could be introduced in the relevant formula(s) to update the multiple ki-factor in a mathematical way under substitution of the existing basis ki-factor formula(s)

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[Table 18] Emission Label (Article 33)

1. Name of label: Emission Label
2. Name of manufacturer: to appear at the top or bottom of the label
3. Certification number: W-MY-HD-0 0 00 (W: year, MY: fixed code, HD: name of manufacturer, 0: OBD available or not, 0: LEV or not, 00: serial number)
4. Model(engine) family name and code: Refer to Attachment.
5. Adjustment of engine: ignition timing, spark plug gap, valve clearance, idle speed, displacement etc.
6. OBD certification: identify "OBD certified" if OBD certified.
7. Engine specification(heavy duty vehicles only)
   A. power(PS/rpm): power certified
   B. minimum fuel consumption(g/PS/h) at full load
   C. intake/exhaust valve lash
   D. injection timing(degree)
8. Emission standards and warranty period for manufactured vehicles and in-use vehicles

- 2014 standard (Diesel), 2013 standard (Gasoline), two-wheeled vehicles

class	CO	NOx	tailpipe HC	PM	Smoke	Remark	
						vehicle class	emission warranty period
new							

Remark: 'HC+NOx' shall be identified in place of 'tailpipe HC' for diesel-fueled vehicles.

-2016 standard (standard alone)

class	Test mode	CO	NOx+HC	PM	Evap.	Remark	
						vehicle class	emission warranty period
Manufacturer	CVS-75						
	Highway						
	US06						
	SC03						

- 2016 standard (composite mode)

class	Test mode	CO	NOx+HC	PM	Evap.	Remark	
						vehicle class	emission warranty period

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Manufacturer	CVS-75						
	Highway						
	Composite						

9. A statement that the vehicle has been manufactured conforming to the requirements of the AEPA and NVCA.
10. For LEV vehicles a statement that the vehicle has been manufactured conforming to the requirements of the Special Act on Capital Region Air Quality Improvement.

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[Attachment to Table 18]

Model Family Coding

"Example"

Gasoline fueled:	M	HD	2.0	VG	5	F	X2	1	1
Diesel fueled:	M	AS	15	HD	2	ABC	DC	1	1
Item No.:	1	2	3	4	5	6	7	8	9

Subcodes (refer to the attached for each detail)

10-1 subcode for year of certification (common)
10-2 subcode for manufacturer (common)
10-3 subcode for displacement (common)
10-4-1 subcode for class of vehicle by fuel used
10-4-2 subcodes for Vehicle Class for vehicles subject to 2006.1.1 emission standards
10-5-1 subcode for fuel metering system (gasoline, LPG)
10-5-2 subcode for fuel metering system (diesel)
10-6-1 subcode for catalyst type (gasoline, LPG, diesel)
10-6-2 subcode for type of engine(diesel)
10-7 subcode for model identification by manufacturer(common)
10-8 subcode for OBD (common)
10-9 subcode for LEV (common)

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10-1 Subcodes for Model Year

Code	Model Year
L	1990
M	1991
N	1992
P	1993
R	1994
S	1995
T	1996
V	1997
W	1998
X	1999
Y	2000
1	2001
2	2002
3	2003
4	2004
5	2005
6	2006
7	2007
8	2008
9	2009
A	2010
B	2011
C	2012
D	2013
E	2014
F	2015
G	2016
H	2017
J	2018
K	2019
L	2020

10-2 Subcodes for Manufacturers

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CODE	Company
DW	GM Daewoo
DC	Tata Daewoo
DB	Daewoo Bus
HD	Hyundai Motor
KM	Kia Motor
SM	Samsung
SY	Ssangyong
VE	Volvo Construction Equipment
HE	Hyundai Heavy Industry
DE	Doosan Infracore

* Other manufacturers shall state the name in two alphabets.

10-3 Subcodes for Displacement: displacement of durability test vehicle

10-4-1 Subcodes for Vehicle Class by fuel used

CODE	VEHICLE CLASS
MC	Two-wheeled motor vehicle (gasoline)
LG	Light-weight vehicle (gasoline)
LD	Light-weight vehicle (diesel)
PG1	PC1 (gasoline)
PD1	PC1 (diesel)
PG2	PC2 (gasoline)
PD2	PC2 (diesel)
PG3	PC3 (gasoline)
PD3	PC3 (diesel)
TG1	Cargo vehicle 1 (gasoline)
TD1	Cargo vehicle 1 (diesel)
TG2	Cargo vehicle 2 (gasoline)
TD2	Cargo vehicle 2 (diesel)
HDG	PC4, cargo vehicle 3 (gasoline)
HDD	PC4, cargo vehicle 3 (diesel)
CE	Construction equipment (diesel)

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* For vehicles fueled by LPG, P shall be substituted for the second alphabet of gasoline vehicles, or C for vehicles fueled by CNG, or H for hybrid vehicles.

10-4-2 Subcodes for Vehicle Class for vehicles subject to 2006.1.1 emission standards

CODE	VEHICLE CLASS
MC	Two-wheeled motor vehicle (gasoline)
LG	Light-weight vehicle (gasoline)
LD	Light-weight vehicle (diesel)
PG	PC-S (gasoline)
PD	PC-S (diesel)
HG	PC-M (gasoline)
HD	PC-M (diesel)
EG	PC-L & XL (gasoline)
ED	PC-L & XL (diesel)
TG	Truck-S (gasoline)
TD	Truck-S (diesel)
THG	Truck-M (gasoline)
THD	Truck-M (diesel)
TEG	Truck-L & XL (gasoline)
TED	Truck-L & XL (diesel)
CE	Construction equipment (diesel)

* For vehicles fueled by LPG, P shall be substituted for the second alphabet of gasoline vehicles, or C for vehicles fueled by CNG, or H for hybrid vehicles, or EV for electric vehicles, EV for electric vehicle and FV for Fuel Cell Electric Vehicle instead of 2nd digit of gasoline vehicle.

10-5-1 Subcodes for Fuel Metering System

Code	Fuel Metering System
0	multiple carburetors(e.g. four two-barrel)
1	1 barrel - LPG
2	2 barrels - LPG
3	3 barrels - LPG
4	4 barrels
5	electronic fuel injection
6	mechanical fuel injection

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9	other

10-5-2 Subcodes for Fuel Metering System

Code	Fuel System
1	electronic fuel injection
2	mechanical fuel injection
3	other

10-6-1 Subcodes for Catalyst Types

Code	Catalyst Type
A	single oxidation
B	more than one oxidation
C	single reduction
D	more than one reduction
E	three-way; no feedback control of fuel/air ratio
F	three-way with feedback control of fuel/air ratio
G	three-way plus other catalyst(s); no feedback control of fuel/air ratio
H	three-way plus other catalyst(s) and feedback control of fuel/air ratio
J	no catalyst
K	other

10-6-2 Subcodes for Type of Engine

Code	Engine
A	compression ignition aspirated engine
B	compression ignition turbo-charged engine
C	compression ignition turbo-charged and aftercooled or intercooled
D	compression ignition super-charged engine
Z	other

Subcodes for Emission Control System

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Code	Control System
A	engine modification
B	air injection
C	exhaust gas recirculation
D	air injection + exhaust gas recirculation
E	smoke-puff-limiter
F	one bank valve
Z	other

10-7 Subcode for model identification by manufacturer shall be stated in two digits.

10-8 Subcodes for OBD

Code	OBD
1	OBD available
2	OBD not available

10-9 Subcodes for LEV

Code	Class of LEV
1	Class 1 LEV
2	Class 2 LEV
3	Class 3 LEV
4	non-LEV

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[Table 18-2]

Emission Label for Electric Vehicles (Article 33)

1. Name of manufacturer:
2. Certification number:
3. Vehicle class:
4. Emission standard: 0g/km
5. Driving range with full charge
   a. Motor vehicles
      ambient temp. : City (Km), Highway (Km), Combined (Km)
      cold temp.(-6.7 deg.) : City (Km), Highway (Km), Combined(Km)
   b. Two-wheeled vehicles
      ambient temp. : CVS 40(Km)
      cold temp.(-10 deg.) : CVS40 (Km),
6. maximum gradeability of electric two-wheeled motor vehicles
7. model Family
8. specifications – motor
   A. type:
   B. maximum power (PS/rpm):
   C. rated voltage (V):
9. specifications – battery
   A. type:
   B. output voltage (V)
   C. capacity (Ah):
10. warranty period of major components
   A. battery:
   B. charger:
   C. motor:
   D. generator:
11. A statement that the vehicle has been manufactured conforming to the requirements of the AEPA and NVCA
12. A statement that the vehicle has been manufactured conforming to the requirements of the Special Act on Capital Region Air Quality Improvement

Remark:
1. The label shall be affixed inside the bonnet in case of passenger cars, or inside the door in

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case of buses and trucks.

2. In case of electric two-wheeled motor vehicles: the same items identified in the certificate of manufacture pursuant to Article 99 Clause 1 of the Motor Vehicle Control Act may be omitted. However, 1, 2, 3, 5, 6,7,10 and 11 above must be included.

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[Table 19] Sampling plan and pass/fail judgment criteria (Article 37 Clause 1)

<19-1> Annual production of 50-99

Stage	Pass No.	Fail No.	Stage	Pass No.	Fail No.
1	*	**	21	9	14
2	*	**	22	10	14
3	*	**	23	10	15
4	0	**	24	11	15
5	0	**	25	11	16
6	1	6	26	12	16
7	1	7	27	12	17
8	2	7	28	13	17
9	2	8	29	14	17
10	3	8	30	16	17
11	3	9			
12	4	9			
13	5	10			
14	5	10			
15	6	11			
16	6	11			
17	7	12			
18	7	12			
19	8	13			
20	8	13			

* Test sample passing not permitted at this stage.

** Test sample failure not permitted at this stage.

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<19-2> Annual production of 100-299

Stage	Pass No.	Fail No.	Stage	Pass No.	Fail No.
1	*	**	21	8	14
2	*	**	22	9	15
3	*	**	23	10	15
4	*	**	24	10	16
5	0	**	25	11	16
6	1	6	26	11	17
7	1	7	27	12	17
8	2	7	28	12	18
9	2	8	29	13	18
10	3	8	30	13	19
11	3	9	31	14	19
12	4	9	32	14	20
13	4	10	33	15	20
14	5	10	34	16	21
15	5	11	35	16	21
16	6	11	36	17	22
17	6	12	37	17	22
18	7	12	38	18	22
19	8	13	39	18	22
20	8	13	40	21	22

* Test sample passing not permitted at this stage.

** Test sample failure not permitted at this stage.

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<19-3> Annual production of 300-499

Stage	Pass No.	Fail No.	Stage	Pass No.	Fail No.	Stage	Pass No.	Fail No.
1	*	**	21	8	14	41	19	24
2	*	**	22	9	15	42	20	25
3	*	**	23	10	15	43	20	25
4	*	**	24	10	16	44	21	26
5	0	**	25	11	16	45	21	27
6	0	6	26	11	17	46	22	27
7	1	7	27	12	17	47	22	27
8	2	7	28	12	18	48	23	27
9	2	8	29	13	18	49	23	27
10	3	9	30	13	19	50	26	27
11	3	9	31	14	19			
12	4	10	32	14	20			
13	4	10	33	15	20			
14	5	11	34	15	21			
15	5	11	35	16	21			
16	6	12	36	16	22			
17	6	12	37	17	22			
18	7	13	38	18	23			
19	7	13	39	18	23			
20	8	14	40	19	24			

* Test sample passing not permitted at this stage.

** Test sample failure not permitted at this stage.

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<19-4> Annual production of 500 or greater

Stage	Pass No.	Fail No.	Stage	Pass No.	Fail No.	Stage	Pass No.	Fail No.
1	*	**	21	8	14	41	19	25
2	*	**	22	9	15	42	19	26
3	*	**	23	9	15	43	20	26
4	*	**	24	10	16	44	21	27
5	0	**	25	11	16	45	21	27
6	0	6	26	11	17	46	22	28
7	1	7	27	12	17	47	22	28
8	2	8	28	12	18	48	23	29
9	2	8	29	13	19	49	23	29
10	3	9	30	13	19	50	24	30
11	3	9	31	14	20	51	24	30
12	4	10	32	14	20	52	25	31
13	4	10	33	15	21	53	25	31
14	5	11	34	15	21	54	26	32
15	5	11	35	16	22	55	26	32
16	6	12	36	16	22	56	27	33
17	6	12	37	17	23	57	27	33
18	7	13	38	17	23	58	28	33
19	7	13	39	18	24	59	28	33
20	8	14	40	18	24	60	32	33

* Test sample passing not permitted at this stage.

** Test sample failure not permitted at this stage.

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[Form No. 1]

Emission System Information Sheet(ESIS)

Item	Details	
make		
engine family		
displacement(cc)		
emission control system	shape of combustion chamber air pump pulse air system closed loop system(O2 sensor) oxidation catalyst reduction catalyst 3-way catalyst closed loop closed loop + air injection ported EGR back pressure EGR other EGR MPI turbo charger super charger electronic control – analog electronic control – digital others	
new system composition		
estimated sales volume		
electronic sensors	coolant temperature oil temperature radiator temperature choke housing temperature exhaust manifold temperature catalyst temperature cabin temperature ambient temperature	

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	canister inside temperature oil pressure exhaust back pressure atmospheric pressure air pump pressure fuel tank pressure ignition timing idle speed vehicle speed rpm idle speed fluctuation manifold vacuum/pressure vacuum change throttle position gear position valve status of accessories(air conditioner etc.) oxygen in exhaust gas airflow through fuel system EGR valve position EGR flow blow-by gas flow fuel injection mass air injection ratio air temperature inside fuel system air/fuel ratio evaporative emission ratio vapor storage device knock crankshaft position others	
other system relating to emission		
other sensors		

Remark: The shape of combustion chamber shall be explained in detail.

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[Form No. 2]

Vehicle Information Data Sheet(VIDS)

Item	Details
make	
VIN(engine No.)	
class	
drive	rear wheel/front wheel/4-wheel
model year	
shape of body	
curb weight	
equivalent inertia weight	
overdrive	
dynamo Power Absorption	
displacement	
bore	
stroke	
engine	gasoline/diesel/other
engine array	in-line/V/other
no. of cylinders	
no. of carburetors	
carburetor type	
make of fuel system/model	
fuel injection	Yes/No
turbo charge	
compression ratio	
ignition timing	
timing rpm	
idle CO%	
idle rpm	
idle rpm tolerance	
axle ratio	
N/V ratio	
unit of speedometer	
air conditioner	

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crankcase system	closed/other	
transmission array		
tire/rim size		
exhaust emission control system	engine code: heat exchanger EGR air pump oxidation catalyst reduction catalyst 3-way catalyst air/fuel controlled closed loop air/fuel controlled 3-way catalyst air injection other	
evaporative emission control system	crankcase canister fuel tank material none canister + charcoal air cleaner other	
fuel used	unleaded/leaded/diesel/other	
fuel tank capacity		
aux. fuel tank capacity		
gear shift timing		
coastdown time(sec.)		
make of tire		
tire structure/size		
tire inflation		
durability vehicle VIN	1st car: 2nd car:	
DF		
gear shift indicator		
roadload calculation	coastdown/frontal area	

Remark: The type of engine shall be explained in detail.

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[Form No. 3]

Noise Reduction Measures

Applicable parts			Noise Reduction Measures
Engine	cylinder cover		
	oil pan cover		
	cylinder head cover		
	others		
Engine Room	engine room under cover		
	engine room side cover		
	engine room rear cover		
	others		
Transmission	transmission under cover		
	others		
Cooling System	fan operation method		
	shape of fan		
	shape of shroud		
	radiator under cover		
	others		
Exhaust System	exhaust pipe noise control		
	tailpipe tuning		
	pre-silencer		
	silencer	internal structure	
		double-wall	
		others	
Intake System	A/C volume and shape		
	intake silencer		
	resonator		
	others		

Remark: Drawings showing “noise reduction measures” shall be attached.

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[Form No. 4]

Details

Section	Description
01.00.00	Introduction
01.00	Brief descriptions about the vehicle
02.00	New technology in emission/noise system
03.00	Development target
04.00	Specifications
02.00.00	Statement of confidentiality
01.00	Confidential information
03.00.00	Fuel used for certification test
04.00.00	Test facilities and equipment
05.00.00	Test procedures
01.00	Emission test
02.00	Mileage accumulation
03.00	Noise test
04.00	Cruising range/charge test
01	Test location
02	Test procedure (specify legal provisions and briefly state that the test done per the provisions)
06.00.00	Maintenance and warranty
01.00	Maintenance schedule of test vehicle (scheduled/unscheduled maintenance)
02.00	Recommended service program for vehicle purchaser
03.00	Warranty
07.00.00	Emission label
01.00	Sample
02.00	Location of label

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08.00.00	General technical description
01.00	Fuel system
02.00	Intake/exhaust system
03.00	Ignition system
04.00	Crankcase emission control system
05.00	Engine
06.00	Catalytic converter
07.00	Exhaust gas recirculation (EGR)
08.00	Electronic control system
09.00	Other emission control system
10.00	Parameter sensed vs. parameter controlled
11.00	Parts list
12.00	Description of SCR – performance and theory
13.00	Analysis of urea for SCR
14.00	Electric Vehicle control system
01	Motor and motor control system
02	Battery and battery control system
09.00.00	Evaporative emission and blow-by gas
01.00	Evaporative emission control system description
02.00	Control system schematic
10.00.00	Model family (engine)
01.00	Emission/noise Model family (engine) description
02.00	Evaporative emission family description
03.00	OBD family description
11.00.00	Test vehicle
01.00	Test vehicle selection
02.00	Durability Data Vehicle Selection Worksheet

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03.00	Emission Data Vehicle Selection Worksheet
04.00	Noise Data Vehicle Selection Worksheet
12.00.00	Agreement to Submit Calibration Information and Information
13.00.00	Others

(details)

01.00.00 Introduction

01.01.00 Background of Development or Characteristics of Certification Vehicle

01.02.00 New Technology or Major Technology of Emission Control/Noise Control System

01.03.00 Development Plan(may be replaced by Type Approval Certificates for imported vehicles)

category	CO (g/km)	NOx (g/km)	NMHC (g/km)	evap (g/test)	PM (g/km)	HCHO (g/km)	smoke (%/kWh)	Cold CO (g/km)
Current standard								
Target								
Conformance to current standard								

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04.00 specifications

Name of vehicle		
Type of vehicle		
specifications	Manufacturer	
	Seating capacity	
	Model year	
	Driving mode	
	Vehicle class	
	purpose	
	Type of transmission	
	Shape of body	
	Curb weight(kg)	
	GVW(kg)	
	Equivalent inertia weight(kg)	
	Dynamo HP	
dimension	Overall length(mm)	
	Overall width(mm)	
	Overall height(mm)	
engine	Manufacturer	
	Type of combustion	
	Type of engine	
	Displacement(cc)	
	Location of engine	
	Fuel used	
	Number of cylinder	
	Cylinder arrangement	
	Type of combustion chamber	

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	Max. output(ps/rpm)			
	Max. torque(kg-m/rpm)			
	Bore*stroke(㎜)			
	Idle speed(rpm)			
	Cooling system			
	Air aspiration			
	Intake manifold	Port size		
		Port shape		
	Exhaust manifold	Port size		
		Port shape		
	Compression ratio			
	Ignition timing(degree)			
Fuel system	Fuel supply method			
	Fuel tank	capacity(ℓ)		
		Location		
		Material		
	Air cleaner	Type		
		No.		
Power train	clutch	Type		
		Operation		
	gearbox	type	Forward	
			reverse	
		control		
		gear ratio	1st	
			2nd	
			3rd	
			4th	
			5st	

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			6st	
			7st	
			R	
	Reduction ratio	1st		
		2nd		
	N/V ratio			
Specifications for electric vehicles	Motor type			
	Battery rated voltage/capacity			
	Max. output			
	Cruising range/charge			
tire	Manufacturer			
	Structure			
	Size	Front		
		Rear		
	inflation	Front		
		rear		
catalyst	Type			
	Composition of precious metal			
	Total charge of precious metal(g)			
	Volume(cm^3)			
	Relative concentration(Pt:Pd:Rh)			
canister	Absorption capacity			
	volume(cc)			
	material			
	Evap. Capacity at 40% fill			
silencer	Main	material		

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		volume(ℓ)	
	sub	material	
		volume(ℓ)	
horn	horn	type	
		spl(dB(C))	

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02.00.00 Statement of Confidentiality

01.00 Confidential Information

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03.00.00Fuel Used for Certification Test

Category		Fuel for Test	Fuel for Mileage Accumulation
gasoline	octane rating		
	aromatic(vol. %)		
	benzene(vol. %)		
	oxygen(mass %)		
	lead(g/l)		
	phosphorus(g/l)		
	olefin(vol. %)		
	vapor pressure(kPa)		
	90% distillation(°C)		
	sulfur(mass %)		
diesel	10% carbon residue(%)		
	sulfur(mass %)		
	cetane rating		
	90% distillation(°C)		
	aromatic(vol. %)		
LPG	vapor pressure(kPa)		
	sulfur(mass %)		
fuel bought from			

Remark:

1. Contents in Table 30 of the AEPA Regulation may be quoted for the appropriate items above if commercial fuel is used.
2. In the event that fuel not sold in Korea is to be used, a fuel supply plan shall be submitted.

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04.00.00 Test Facilities and Equipment

01.00 Emission test facilities

Facility/Equipment Name	Model (manufacturer)	manufacturer	Type Approval No.	Date of Type Approval	Last calibration date	Name of test lab

02.00 Noise test facilities

Facility/Equipment Name	Model (manufacturer)	manufacturer	Type Approval No.	Date of Type Approval	Last calibration date	Name of test lab

Remark:
Any reference number may be quoted in place of Type Approval No. if in-house facilities/equipment is used.

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05.00.00 Test Procedures

01.00 Emission Test

01 Test Location

02 Test Procedures(relevant legal provisions and brief descriptions about the test procedures)

02.00 Mileage Accumulation

01 Durability Driving

02 Run-in Driving

03 Driving Schedule

04 Driving Place

05 Driving Schedule(relevant legal provisions and brief descriptions about the test procedures)

03.00 Noise Test

01 Test Location

02 Test Procedures (relevant legal provisions and brief descriptions about the test procedures)

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06.00.00Maintenance and Warranty

01.00 Maintenance Schedule of Test Vehicle

01 Scheduled/Unscheduled Maintenance

Service Item	Service Period	( )km	( )km	( )km	( )km	Remark
engine	oil					
	oil filter					
	idle					
	belt					
	coolant					
ignition system	air cleaner					
	carburetor					
	ignition plug					
	ignition coil					
chassis	gearbox oil					
	rpm and air-fuel ratio					
	vaporizer					
	solenoid valve					
	LPG filter					
emission and evap. control system	catalytic converter					
	oxygen sensor					
	throttle body & MAF sensor					
	sensors					
others	moving parts					
	cooling system					

02 Unscheduled Maintenance

(no separate form in KENCIS)

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02.00 Customer Recommended Maintenance

Service Item / Service Period		( )km	( )km	( )km	( )km	Remark
engine	oil					
	oil filter					
	idle					
	belt					
	coolant					
ignition system	air cleaner					
	carburetor					
	ignition plug					
	ignition coil					
chassis	gearbox oil					
	rpm and air-fuel ratio					
	vaporizer					
	solenoid valve					
	LPG filter					
emission and evap. control system	catalytic converter					
	oxygen sensor					
	throttle body & MAF sensor					
	sensors					
others	moving parts					
	cooling system					

Remark: ○ Inspection, adjustment, top up ●replace

03.00 Warranty

01 Warranty Details

02 Warranty Period

03 Items Not Covered by Warranty

04 Responsibilities of Vehicle Purchaser

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08.00.00 General Technical Description

Each items, where appropriate, shall be described in the following format, and drawings for control system shall be attached.

item	sub-item	structure/make/dimension/capacity etc.	technique/theory of control	effect of emission reduction
01.01. supply system				
01.02. control system				
01.03. injection system				

01.00 Fuel System
- 01 Fuel Supply
- 02 Fuel Control
- 03 Fuel Injection

02.00 Intake/Exhaust System
- 01 Intake System
- 02 Exhaust System

03.00 Ignition System

04.00 Crankcase Control System

05.00 Engine

06.00 Catalytic Converter
- 01 type of catalyst
- 02 relative concentration
- 03 volume

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04 total charge

05 structure and shape

07.00 EGR

08.00 Electronic Control System

01. System specification, Input/output signal

02. Method for calculating engine torque and compliance data (limited to large-sized or extra large-sized PC and Trucks subjected to in-use compliance test)

09.00 Other Emission Control System

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10.00 Parameter Sensed vs. Parameter Controlled

(in the order shown in KENCIS)

Parameter sensed	Parameter controlled				
	fuel (air-fuel ratio)	Ignition timing	Canister purge	Idle speed	EGR
Coolant temp.					
Engine knocking					
Vehicle speed					
Throttle position					
Air pressure					
Air conditioner					
Oxygen concentration in exhaust gas					
Engine rpm					
Gear position					
Intake air temp.					
Intake air mass					
Stop and neutral					
Battery voltage					
Brake applied					
Intake backpressure					
Crankshaft position					
Camshaft position					

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11.00 Parts List (based on KENCIS)

item		P/N	Manufacturer		remark
			name	country	
Ignition system	distributor				
Fuel system	Ambient air pressure sensor				
	MAF sensor				
	Coolant temperature sensor				
	Fuel injector				
	Fuel injection pump				
	Fuel pressure regulator				
	Throttle position sensor				
	Common rail				
	ECU				
Emission control system	Catalytic converter				
	Oxygen sensor				
	DPF				
EGR	EGR valve				
Evap. Control system	Canister				
	Purge control valve				
	Filter				
Blow-by gas recirculation	PCV valve				
Secondary air injection	Air pump				
	Lead valve				

12.00 Description of SCR – performance and theory

item	detail	Structure/mfr/size/capacity	Control technique/control theory	Effect for emission reduction
Supply system				
Control system				
Injection system				
Charge warning				

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system				

13.00 Analysis of urea for SCR

item	Result of analysis	Analysis body	Analysis method	Date of Analysis	Ref. number

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09.00.00 Evaporative emission and blow-by gas

01.00 Evaporative Emission Control System description (not required; covered in 01.04.00)

Storage Device Absorption Capacity(g) Size(cm3)/medium

canister

evap. code	fuel tank capacity(l)	max. fuel tank vapor volume(l) at 40% tank fill	max. volume of reservoir of carburetor/fuel injection system	car line

02.00 Control System schematic

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10.00.00 Model family

01.00 Model family (engine) description

Name of vehicle				
Vehicle type				
Shape of vehicle				
Seating capacity				
Fuel used				
Displacement(cc)				
Type of combustion				
Number of cylinder				
Max. output(ps/rpm)				
Max. torque(kg-m/rpm)				
bore*stroke(mm)				
Compression ratio				
Cylinder bore spacing(mm)				
Shape of cylinder block				
Cylinder arrangement				
Type of cylinder head				
Intake manifold		Size of intake port		
		Shape of intake port		
Exhaust manifold		Size of exhaust port		
		Shape of exhaust port		
Valve	intake	Opening		
		Closing		
	exhaust	Opening		
		Closing		
No. of intake				

valve/cylinder	exhaust		
Valve size	Intake		
	exhaust		
Air aspiration			
catalyst	type		
	Precious metal		
	Total charge of precious metals(g)		
	volume(cm^3)		
	Relative concentration(Pt:Pd:Rh)		
Dimension from the center line of the crankshaft to the center line of the camshaft(mm)			
Dimension from the center line of the crankshaft to the top of the cylinder block head face(mm)			
Surface to volume ratio of combustion chamber at TDC			
Fuel supply system			
Ignition timing control range			
Camshaft timing			
Equivalent inertia weight			
Road load			

02.00 Evaporative emission family description

	Basic model	Evap. Family
Emission certification number		
Name of vehicle		
Vehicle type		
Engine type		
Vehicle class		
Fuel used		
Vapor storage device		

Canister	Absorption capacity		
	No. of canister and connection method		
	Shape		
	Structure		
	Material		
Fuel system			
Method of fuel filler pipe sealing			
Evaporative emission control system			
Purge control system			
Evaporative emission hose material			
Fuel tank material			

03.00 OBD family description

	Basic model	OBD Family
Emission certification number		
Name of vehicle		
Vehicle type		
Engine type		
Vehicle class		
Fuel used		
Type of OBD (called by mfr)		
Emission standard		
Combustion cycle		
Fuel supply system		
Type of catalytic converter		
Type of DPF		
Secondary air injection (Y/N)		

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EGR (Y/N)		

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11.00.00 Test vehicle

01.00 Test Vehicle Selection

(based on KENCIS)

class item	Durability test	Emission test
VIN		
Engine No.		
Displacement (cc)		
Engine type		
Name of vehicle		
Type of gearbox		
Road load		
Inertia weight (kg)		
Final drive ratio		
N/V ratio, rpm/kph		
Tire size		
Tire inflation		
remark		

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02.00 durability data vehicle selection

name item		
Type of vehicle		
Gearbox		
Type of engine		
Displacement		
Curb weight		
Equivalent inertia weight		
Road load		
Fuel tank capacity		
Final reduction ratio(1st reduction rate)		
Estimated sales volume		

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03.00 Emission data vehicle selection

A. when using a chassis dynamometer

Name of vehicle Item		
Type of vehicle		
Biggest inertia weight within the model family		
Biggest road load within the above condition		
Biggest displacement within the above condition		
Gearbox of the highest final reduction ratio within the above condition		
Biggest fuel tank capacity within the above condition		

B. When using an engine dynamometer

Type of vehicle Item		
1.engine with biggest fuel distribution ratio per stroke at max torque rpm		
2. engine with biggest fuel distribution ratio per stroke at max speed		

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04.00 Noise test vehicle selection

Type of vehicle item		
1.model with a heaviest curb weight		
2.model with a biggest displacement		
3.model equipped with a gearbox of a highest final reduction ratio (including overdrive)		
4. model with a highest axle ratio		

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12.00.00 Agreement to Submit Calibration Information and Information

(Any reason for not being able to specify detailed development plan may be stated in 12.00.00 if it is not available at the time of submission of application documents, and it may be submitted at the time of submitting the durability data final report.)

13.00.00 Others

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[Form No. 4-2]

Details

Section	Description
01.00.00	Introduction
01.00	Development background and characteristics
02.00	Specifications
02.00.00	Statement of confidentiality
01.00	Request for securing confidentiality
03.00.00	Test facilities and equipment
04.00.00	Test procedures
01.00	Noise test
02.00	Driving range test with full charge for EV
05.00.00	Maintenance and warranty
01.00	Warranty
06.00.00	Emission label
01.00	Sample
02.00	Location of label
07.00.00	Main components of EV
01.00	Components list
02.00	EV control system

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01.00.00 Introduction

01.01.00 Background of Development or Characteristics of Certification Vehicle

02.00 specifications

Name of vehicle				
Type of vehicle				
specifications	Manufacturer			
	Seating capacity			
	Model year			
	Driving mode			
	Vehicle class			
	purpose			
	Type of transmission			
	Shape of body			
	Curb weight(kg)			
	GVW(kg)			
	Equivalent inertia weight(kg)			
	Actual dynamo HP			
dimension	Overall length(mm)			
	Overall width(mm)			
	Overall height(mm)			
Power train	clutch	Type		
		Operation		
	gearbox	type	Forward	
			reverse	
		control		
		gear	1st	

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		ratio	2nd	
			3rd	
			4th	
			5st	
			6st	
			7st	
			R	
	Reduction ratio	1st		
		2nd		
	N/V ratio			
Specifications for electric vehicles	Motor type			
	Battery rated voltage/capacity			
	Max. output			
	Driving range with full charge			
tire	Manufacturer			
	Structure			
	Size	Front		
		Rear		
	inflation	Front		
		rear		
emission related items	Road load (hp)			
	RRC			
	C/D time (sec)			
horn	horn	type		
		Performance (dB(C))		

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02.00.00 Statement of Confidentiality

01.00 Request for securing confidentiality

A. Certification information which should be secured for confidentiality after being sold to the market as model year OO.

03.00.00Test Facilities and Equipment

01.00 Emission test facilities

Facility/Equipment Name	Model (manufacturer)	manufacturer	Type Approval No.	Date of Type Approval	Last calibration date	Name of test lab

02.00 Noise test facilities

Facility/Equipment Name	Model (manufacturer)	manufacturer	Type Approval No.	Date of Type Approval	Last calibration date	Name of test lab

Remark:

Any reference number may be quoted in place of Type Approval No. if in-house facilities/equipment is used.

04.00.00 Test Procedures

01.00 Noise Test

01 Test Location

02 Test Procedures (relevant legal provisions and brief descriptions about the test procedures)

02.00 Driving range test with full charge

01 Test Location

02 Test Procedures(relevant legal provisions and brief descriptions about the test procedures)

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05.00.00 Maintenance and Warranty

01.00 Warranty

01 Warranty Details

02 Warranty Period

03 Items Not Covered by Warranty

04 Responsibilities of Vehicle Purchaser

06.00.00 Emission label

01.00 Sample

02.00 Label position, etc.

07.00.00 Main components of EV

01.00 Components list

Item		Parts No.	Manufacturer		Remark
			Company	Country	
Motor					
Battery					
Battery control system					
Inverter					
Capacitor (Charger)					
Converter, etc.					

02.00 EV control system

01. Motor and motor control system

02. Battery and battery control system

03. Control system diagram

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[Form 9]

Documentation for OBD certification

	Description
01.00.00	OBD system description
01.00	OBD general description
02.00	In-house test results and technical descriptions
02.00.00	Model family description
01.00	Vehicle specifications (representative model)
03.00.00	Test vehicle
01.00	OBD test vehicle selection

01.00.00 OBD system description

A. Gasoline engine vehicle

01.00 OBD general description

The manufacturer shall submit the following documentation, and test results, diagram, drawing etc. shall be attached:

a. A written description of the functional operation of the OBD

b. A table providing the following information for each monitored component or system of the emission control system:

(1) corresponding fault code

(2) monitoring method or procedure for malfunction detection

(3) primary malfunction detection parameter and its type of output signal

(4) fault criteria limits used to evaluate output signal of primary parameter

(5) other monitored secondary parameters and conditions necessary for malfunction detection

(6) monitoring time length and frequency of checks

(7) criteria for storing fault code

(8) criteria for illuminating malfunction indicator light

(9) criteria used for determining out of range values and input component rationality checks

c. A logic flowchart describing the general method of detecting malfunctions for each monitored emission-related component or system

d. A listing and block diagram of the input parameters used to calculate or determine calculated load values and the input parameters used to calculate or determine fuel trim values

e. A scale drawing of the MIL and the fuel cap indicator light

f. A description of the modified or deteriorated components used for fault simulation with respect to the demonstration tests

g. A listing of all electric powertrain input and output signals

h. Any other information deemed necessary to demonstrate compliance with the requirements

02.00 In-house test results and technical descriptions

The manufacturer shall submit the following documentation, and test results, diagram, drawing etc. shall be attached:

a. OBD test results according to the test regulation

b. Data supporting the selected degree of misfire which can be tolerated without damaging the catalyst

(1) the percentage of misfire (evaluated in 200 revolution increments) for each engine speed and load condition that would result in a temperature that causes catalyst damage

(2) the percentage of misfire (evaluated in 1000 revolution increments) that would cause emissions from an emission durability demonstration vehicle to exceed 1.5 times any of the applicable standards

(3) the temperature of the catalyst against the percentage of misfire for each engine speed and load condition

c. Data supporting the limit for the time between engine starting and attaining the designated heating temperature for heated catalyst systems

d. data supporting the criteria used to indicate a malfunction when catalyst deterioration causes emission to exceed the applicable threshold

e. Data supporting the criteria used to detect evaporative purge system leaks

B. Diesel engine vehicle and two-wheeled vehicle

01.00 List and purpose of all components such as sensors and actuators monitored by the OBD system

02.00 Written description of the MI

03.00 Statement for prohibition of arbitrary alteration or modification of emission control unit

04.00 Written description (general working principles)for:

a. catalyst monitoring

b. particulate trap monitoring

c. electronic fuelling system monitoring

d. other components monitored by the OBD system

e. criteria for MI activation (fixed number of driving cycles or statistical method)

f. list of all OBD output codes and formats used (with explanation of each)

05.00 Additional information

a. A description of the type and number of the pre-conditioning cycles used for the malfunction demonstration test

b. A description of the type of the OBD demonstration cycle for the component monitored by the OBD system

c. A comprehensive document describing all sensed components with the strategy for fault detection and MI activation (fixed number of driving cycles or statistical method), including a list of relevant secondary sensed parameters for each component monitored by the OBD system.

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The information required by this section may, for example, be defined by completing a table as follows.

compo-nent	fault code	monitoring strategy	fault detection criteria	MI activation criteria	secondary parameters	precon-ditioning	demonstration test
catalyst	P0420	oxygen sensor 1 and 2 signals	difference between sensor 1 and sensor 2 signals	3rd cycle	engine speed, engine load, A/F mode, catalyst temperature	two type 1 cycles	type 1

06.00 Internal test results and technical descriptions

The manufacturer shall submit the test results according to the test requirements.

02.00.00 Model family (engine)

01.00 Vehicle specifications (representative model)

1. General

Name of vehicle	Type	Vehicle class	Fuel used	Type of gearbox	GVW (curb wgt)

2. Engine

Type	Max output (PS/rpm)	Displacement (cc)	Type of combustion	Combustion cycle	Fuel supply

3. Emission control system and OBD

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Type of catalyst (mfr)	Secondary air injection	EGR
	Y/N	Y/N
ECU (mfr)	Oxygen sensor (mfr)	Purge control valve (mfr)

02.00 OBD family

Name (type)	Type of engine	Displacement (cc)	Max. output	Gearbox (No.)	GVW (curb wgt)

03.00 OBD family description

Name of vehicle class			
engine	Combustion (spark ignition, compression ignition, 2-cycle, 4-cycle etc.)		
	Fuel supply(carburetor, injection etc.)		
Emission control system	Type of catalyst (oxidation, 3-way, heated etc.)		
	Type of DPF		
	Secondary air injection		
	EGR		
OBD	OBD operation		
	Malfunction detection		
	Malfunction indicator		

03.00.00 Test vehicle

01.00 OBD test vehicle selection

class item	OBD test vehicle

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VIN (engine No.)		
Displacement (cc)		
Engine code		
Evap code		
Catalyst code		
Emission control system	Exhaust emission	
	Evap.	
Name of vehicle		
Type of transmission		
Shift schedule		
Inertia weight (kg)		
Final drive ratio		
N/V ratio, rpm/kph		
Tire		
emission control system	Type of catalyst (oxidation, 3-way, heated etc.)	
	Type of DPF	
	Secondary air injection	
	EGR	
OBD	OBD operation	
	Malfunction detection	
	Malfunction indicator	
	monitoring item	
remark		

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[Form No. 10]

Documentation for emission reduction devices

[Form No. 10]

Documentation for Emission Reduction Devices

No.	Description
01.00.00	Description for emission reduction device
01.00	System configuration
02.00	Component information
03.00	Technique/theory of control
04.00	Results of composition analysis for urea solution
02.00.00	Operating theory of major function, and operating mechanism regarding detection, warning and output limitation

01.00.00 Documentation for emission reduction devices

A. Selective Catalytic Reduction (SCR)

01.00 System configuration

02.00 Component information

Item	Details	Structure/make/dimension/capacity etc.
supply system		
control system		
injection system		
warning system for charge		

03.00 Technique/theory of control

Item	Technique of control and theory of operation
supply system	
control system	
injection system	
warning system for charge	

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04.00 Results of composition analysis for urea solution

Items	Analysis results	Analyzing agency	Analysis method	Analysis Year/Month/Date	Evidence #

B. Exhaust Gas Recirculation (EGR)

01.00 System configuration

02.00 Component information

item	Details	structure/make/dimension/capacity etc.
cooling system		
valve & motor		
control system		
warning system		

03.00 Technique/theory of control

item	Technique of control and theory of operation
cooling system	
valve & motor	
control system	
warning system	

02.00.00 Operating theory of major function, and operating mechanism regarding detection, warning and output limitation

A. SCR

a. Function of warning charge of urea solution or malfunction of reduction device

b. Function of anti-freezing or defrosting urea solution

c. Durability performance (evidence for system durability during a period of in-use vehicle compliance test)

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d. Function of limiting output

Items subject to following categories shall be filled in by each category as the example below. <Example> (1) If using all of urea solution charged in a tank (control by level-detection sensor) a) Theory of output limitation: If a urea tank is empty, output signal of level-detection sensor becomes 0V and the output limitation is activated upon 0V. b) Timing of output limitation: it shall be activated immediately when 0V is recognized. c) Function of level-detection sensor: it means the sensor which is equipped in urea tank and detects urea amount, and full charge is recognized as 10V and empty status as 0V. Its theory is that urea amount is measured by detecting a position of measuring-means floating on a fluid.

(1) If using all of urea solution charged in a tank

(2) If using a poor urea solution, or manipulating device such as an injector deliberately in order to reduce consumption amount of urea solution

(3) If removing SCR deliberately

(4) If mechanical failure of emission reduction device occurs, such as malfunction of urea solution injector of SCR

(5) If causing a failure of NOx sensor (if equipped) or a sensor detecting amount of urea solution, or if manipulating or removing those sensors deliberately

(6) If causing the hindrance to normal operation of other SCR functions

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B. EGR

a. Function of warning malfunction of reduction device

b. Details for other alternative measures in case of EGR without NOx sensors

c. Durability performance (evidence for system durability during a period of in-use vehicle compliance test

d. Function of limiting output

Items subject to following categories shall be filled in by each category as the example below. <Example> (1) If removing EGR deliberately (control by air mass sensor) a) Theory of output limitation: If removing EGR deliberately, more air mass than maximum (1,000g/h) of normal condition is inhaled into the intake and the output signal of air mass sensor indicates 10V or more and the output limitation is activated upon 10V. b) Timing of output limitation: it shall occur immediately upon 0V. c) Function of air mass flow sensor: It means the sensor which is equipped in end of air cleaner and measure air mass flow. The theory is that the sensor can detect an upper limit of air mass flow, because intake air mass increases in case of abnormal operation of EGR.

(1) If removing EGR deliberately

(2) If mechanical failure such as EGR valve stuck occurs

(3) If removing the connectors such as power supply of EGR

(4) If causing a failure of sensors such as EGR valve-position detection and NOx sensor (if equipped), or if manipulating or removing those sensors.

(5) If causing a failure of EGR actuator motor or if manipulating or removing the motor

(6) If causing any hindrance to normal operation of other EGR function

(7) 04.00 Analysis results for Urea composition

Items	Analysis results	Analyzing agency	Analysis method	Analysis Year/Month/Date	Evidence #

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[Form No. 11]

Specifications for Individual Vehicles

Name of vehicle				
Type of vehicle				
VIN				
specifications	Manufacturer			
	Seating capacity			
	Model year			
	Driving mode			
	Vehicle class			
	purpose			
	Type of transmission			
	Shape of body			
	Curb weight(kg)			
	GVW(kg)			
	Equivalent inertia weight(kg)			
	Kickdown			
	Odometer reading			
dimension	Overall length(mm)			
	Overall width(mm)			
	Overall height(mm)			
engine	Type of engine			
	Displacement(cc)			
	Location of engine			
	Fuel used			
	Number of cylinder			
	Cylinder arrangement			
	Max. power(PS/rpm)			
	Max. torque(kg-m/rpm)			
	Bore*stroke(㎜)			
	Idle speed(rpm)			
	Cooling system			
	Air aspiration			
Fuel system	Fuel supply method			
	Fuel tank	capacity(ℓ)		
		Location		
Power train	gearbox	type	Forward	
			reverse	
		control		
		gear ratio	$1^{st}/2^{nd}$…	
			R	
	Reduction ratio	1st		
		2nd		
Specifications for electric	Motor type			

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vehicles	Battery rated voltage/capacity		
	Max. power		
	Cruising range/charge		
tire	Size	Front	
		Rear	
	inflation	Front	
		rear	
silencer	No. and material		
horn	horn	type	
		spl(dB(C))	
Emission test	Road load (hp)		
	Dyno power absorption		
	Coastdown time (sec)		
OBD availability			
Modification of emission related components			

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Form No. 12 & 13

(not translated – applicable to individual vehicle certification)

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[Form No. 14]

Manufacturer's Durability Test Data Sheet(MTDS)

* General
  Name of company:
  Representative:
  Model(family):
  Class of vehicle:
  Ref. No. of document:
  Details of engine
    Displacement:
    Max. torque
    Cylinder:
    Evap. control:
    Fuel supply system:
    EGR:
    Leakage control:
    ECU:
    Fuel:
    Oxygen sensor:

* Model Family Information
  Model family:
  Shape of vehicle:
  Type of engine(displacement):
  Transmission:
  Air conditioner:
  Power steering system:
  Power brake system:
  Gear ratio: 1st: 2nd: 3rd: 4th: 5th:
  Curb weight:
  Equivalent inertia weight:
  Coastdown time:
  Roadload:
  Final drive ratio:
  Fuel tank capacity:

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Estimated sales volume/year:

* Details of Test Vehicle and Test Results

Model:

Shape of vehicle:

Emission control system

Part	P/N	Country of origin	Make
carburetor			
ECU			
Sensors/switches			
Ignition system			
Catalyst			
Fuel injection system			

Emission test results(least squares)

Pollutant	6,400kg	80,000km	160,000km	DF	Test equipment
CO					
HC					
NOx					
PM					
Evap. HC					
Fuel consumption					
Test date					

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[Form No. 15]

Emission Test Analysis Report(CVS-75 mode)

1. General

Name of vehicle for certification:
Name of test vehicle:
Test date:
Test class: durability data/emission data/periodic test/other
Test No.:
Tested by:
Checked by:

2. Details of Test Vehicle

VIN:
Date of manufacture:
Production line:
Odometer reading:
Transmission type:
Axle ratio:
GVW:
Inertia weight:
Curb weight:
Roadload at 80.5km/h:
Coastdown time at 80km/h:
Tire inflation:
Fuel tank capacity and location:
mileage accumulation method:

3. Details of Engine of Test Vehicle

Engine No.:
Engine type:
Max. power:
Displacement:
No. of cylinders:
Idle speed:
Carburetor type:

Fuel injection type:
Cycle:
Cylinder configuration:
Size of catalyst:
Loading:
Test fuel:

4. Details of Test Equipment

Dynamometer

Type:
Capacity:
Inertia:
Type of roller, diameter:
Actual/displayed roadload:
Control method:
Model:

Analyzer

Type of CO analyzer:
Type of HC analyzer:
Type of NOx analyzer:
Type of CO_2 analyzer:

Span calibration concentration

CO: HC: NOx: CO_2:

CVS

Type:
Capacity:
Thermal reactor:
Model:

5. Ambient Test Conditions

Category	Bag 1	Bag 2	Bag 3
Average inlet pressure:			
Average inlet temperature:			
Relative humidity:			
NOx compensation factor			
Total CFV volume:			
Dilution Factor:			

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Mileage driven:

6. Test Results

Category	Phase 1		Phase 2		Phase 3	
	emission mass	g/km	emission mass	g/km	emission mass	g/km
CO						
HC						
NOx						
CO_2						
Fuel consumption						

Item	CO	NOx	HC			PM	CO2	FE	Idle CO %	HCHO
			tailpipe	blow-by	evap.					
Test results(g/km)										
DF										
Final Results(g/km)										
standard										

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[Form No. 15-2]

Driving range test when fully charged (UDDS/HEFEW)

Test vehicles

Vehicle Name /Type : _____

Manufacturer : _____

VIN : _____

Curb weight : _____ **kg**

Road load coefficient (a,b,c) : _____

Odometer : _____**km**

Tire Pressure

Front _____ **kpa** , Rear : _____ **kPa**

Motor Specification

Type : _____

Max output : _____ ps/rpm

Rated voltage : _____ V

Battery

Type : _____

Output Voltage : _____ V

Capacity : _____ Ah..

Test date : _____ (Year/ Month/Date)

Test location : _____

Measured by : _____

Lab. Condition

Ambient pressure : _____

Temp : _____

Relative humidity : _____

Traction Battery

Full charge time _____Hour____Min____Sec.

Initial Voltage : _____ V

Final Voltage : _____V

Charging data

Accumulated DC Wattage [Wh]	Accumulated AC Wattage[Wh]	Charging duration[hours]

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Driving data

[Ambient Temp.]

Times	Times	Driving distance [km]	Accumulated driving distance [km]	Discharged AC wattage after test completion [Wh]	AC Energy consumption of EV after test completion [Wh/km]	Remark
UDDS	1					
	2					
	3					
	...					
	AC and DC wattage required till full charge after test completion (Wh)					
HWFEW	1					
	2					
	3					
	...					
	AC and DC wattage required till full charge after test completion (Wh)					

[Cold Temp.]

Times	Times	Driving distance [km]	Accumulated Driving distance [km]	Discharged AC wattage after test completion [Wh]	AC Energy consumption of EV after test completion [Wh/km]	Remark
UDDS	1					
	2					
	3					
	...					
	AC and DC wattage required till full charge after test completion (Wh)					
HWFEW	1					
	2					
	3					
	...					
	AC and DC wattage required till full charge after test completion (Wh)					

Final Test Results

Temp. [℃]	Test mode	Total driving distance [km]	Accumulated Discharged AC wattage [Wh]	System DC Energy consumption rate [Wh/km]	System AC Energy consumption Rate [Wh/km]	AC Energy consumption rate of EV [Wh/km]
Ambient	UDDS					
	HEFEW					
	Combined					
Cold [-6.7℃]	UDDS					
	HEFEW					
	Combined					

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[Form No. 16]

Cold CO test report

1. General

Name of vehicle for certification:
Name of test vehicle:
Test date:
Test class: durability data/emission data/periodic test/other
Test No.:
Tested by:
Checked by:

2. Details of Test Vehicle

VIN:
Date of manufacture:
Production line:
Odometer reading:
Transmission type:
Axle ratio:
GVW:
Inertia weight:
Curb weight:
Roadload at 80.5km/h:
Coastdown time at 80km/h:
Tire inflation:
Fuel tank capacity and location:
mileage accumulation method:

3. Details of Test Vehicle Engine

Engine No.:
Engine type:
Max. power:
Displacement:
No. of cylinders:
Idle speed:
Carburetor type:

Fuel injection type:
Cycle:
Cylinder configuration:
Size of catalyst:
Loading:
Test fuel:

4. Details of CVS-75 Test Equipment

Dynamometer

Type:
Capacity:
Inertia:
Type of roller, diameter:
Actual/displayed roadload:
Control method:
Model:

Analyzer

Type of CO analyzer:
Type of HC analyzer:
Type of NOx analyzer:
Type of CO_2 analyzer:

Span calibration concentration

CO: HC: NOx: CO_2:

CVS

Type:
Capacity:
Thermal reactor:
Model:

5. Ambient Test Conditions

Category	Bag 1	Bag 2	Bag 3
Average inlet pressure:			
Average inlet temperature:			
Relative humidity:			
NOx compensation factor			
Total CFV volume:			
Dilution Factor:			

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Mileage driven:

6. Test Results

Category	Phase 1		Phase 2		Phase 3	
	emission mass	g/km	emission mass	g/km	emission mass	g/km
CO						
HC						
NOx						
CO_2						
Fuel consumption						

Item	Cold CO	NOx	HC			PM	CO2	FE	Idle CO %	HCHO
			tailpipe	blow-by	evap.					
Test results(g/km)										
DF										
Final Results(g/km)										
standard										

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[Form No. 17]

Emission test report (ECE15 + EUDC mode)

1. General
   Name of vehicle for certification:
   Name of test vehicle:
   Test date:
   Test class: durability data/emission data/periodic test/other
   Test No.:
   Tested by:
   Checked by:

2. Details of Test Vehicle
   VIN:
   Date of manufacture:
   Production line:
   Odometer reading:
   Transmission type:
   Axle ratio:
   GVW:
   Inertia weight:
   Curb weight:
   Roadload at 80.5km/h:
   Coastdown time at 80km/h:
   Tire inflation:
   Fuel tank capacity and location:
   mileage accumulation method:

3. Details of Test Vehicle Engine
   Engine No.:
   Engine type:
   Max. power:
   Displacement:
   No. of cylinders:
   Idle speed:
   Carburetor type:

Fuel injection type:
Cycle:
Cylinder configuration:
Size of catalyst:
Loading:
Test fuel:

4. Details of CVS-75 Test Equipment

Dynamometer

Type:
Capacity:
Inertia:
Type of roller, diameter:
Actual/displayed roadload:
Control method:
Model:

Analyzer

Type of CO analyzer:
Type of HC analyzer:
Type of NOx analyzer:
Type of CO_2 analyzer:

Span calibration concentration

CO: HC: NOx: CO_2:

CVS

Type:
Capacity:
Thermal reactor:
Model:

5. Ambient Test Conditions

Category	Bag 1	Bag 2
Average inlet pressure:		
Average inlet temperature:		
Relative humidity:		
NOx compensation factor		
Total CFV volume:		
Dilution Factor:		

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Mileage driven:

6. Test Results

Category	Phase 1		Phase 2			
	emission mass	g/km	emission mass	g/km		
CO						
HC						
NOx						
CO_2						
PN						
Fuel consumption						

Item	CO	NOx	HC+NOx	PM	CO2	FE	PN (#/km)	HCHO
Test results(g/km)								
DF								
Periodically Regeneration Factor (Ki)								
Final Results(g/km)								
standard								

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Form No. 18 through Form No. 20

(not translated – not applicable to ordinary certification)

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Form No. 22

(not translated – not applicable to ordinary certification)

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[Form No. 23]

Evaporative Emission Test Report

1. General

Name of certification vehicle:
Model family:
Name of test vehicle:
Test date:
Test No.:
Tested by:
Checked by:
VIN:
Engine No.:
Odometer reading:
Type of test: durability/emission/other

2. SHED and Test Equipment

SHED dimension(HxWxL): Net volume:
Temp. control method: Heater:
SHED model: Analyzer:
HC zero/span calibration method:
Canister
Volume: Material: Mass:
Mass after test: Mass loss:

3. Test Results

Category	Test start(SHED)			Test finish(SHED)			Results g
	Temp. °C	Baro. pressure mmHg	Concentration ppm	Temp. °C	Baro. pressure mmHg	Concentration ppm	
Diurnal							
Hot soak							
Results							
DF							

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Final	
Standard	

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Form No. 24 through Form No. 25

(not translated – applicable to trucks)

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[Form No. 26]

OBD test report

□ General

Date of test	Operated by	Checked by

□ Vehicle specifications

1. General specifications

Name of vehicle	Type	Class	Fuel used	Transmission	GVW (Curb weight) (kg)

2. Engine

Type	Max. output (PS/rpm)	Displacement (cc)	Combustion type	Combustion cycle	Type of fuel supply

3. Emission control system and OBD

P/N of catalyst (mfr)	Secondary air system	EGR
	Yes □ No □	Yes □ No □
P/N of ECU (mfr)	P/N of oxygen sensor (mfr)	P/N of purge control valve (mfr)

□ Test results

Monitoring item		Test results				Judgment			
system	Fault condition	CVS-75 mode (g/km)			MIL illumination (Y/N)	Malfunction criteria (g/km)			Monitoring system (accept/reject)
		CO	NOx	HC		CO	NOx	HC	

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※ Emission test results and details of fault conditions shall be attached (including computer print-out).

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[Form No. 27]

Noise Test Report (ISO362)

1. Test method
   pass-by noise: ISO362
   exhaust/horn noise: existing method

2. Test Date:

3. Details of Test Vehicle

Item	Details	Item	Details
Name of vehicle		Manufacturer(country)	
Vehicle class		VIN	
Type		Engine No.	
Engine code		Max. output(PS/rpm)	
Displacement(cc)		transmission ratio (or gear ratio)	
Transmission type and No. of gears		No. of cycle	
Reduction ratio		GVW(kg)	
Curb weight(kg)		Tire inflation(psi)	
Dynamic rolling circumference of tire(m)		Tire size and tread depth	
Type of silencer, mounting location, No.		Horn type and No.	
kickdown operation		Vehicle length	
		other	

4. Test site condition

Item	Details	Item	Details
Location		Weather	
Orientation		Wind speed	
Ambient temp.		Other	

5. Noise Test Equipment

Item	Manufacturer	Type	Equip. No.	Calibration date
Sound level meter				
Calibrator				
Vehicle speed tester				
rpm tester				
meteorological test equipment(wind speed temp.)				
Recording device				N/A

6. Pass-by noise test results

run	gear used	approach speed(km/h)	vehicle speed (km/h)		engine rpm		WOT location(m)	ambient noise [dB(A)]	noise measured [dB(A)]		compensation [dB(A)]	remark
			entrance	exit	entrance	exit			left	right		
1st												
2nd												
3rd												
4th												
average												
result												
1st												
2nd												
3rd												
4th												

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average						
result						

7. Exhaust noise test results

No.	engine speed (75% of rpm @max. output)	ambient noise [dB(A)]	exhaust noise[dB(A)]		result [dB(A)]	remark
			measured	compensated		
1						
2						

8. Horn noise test results

No.	type of horn	No. of horn	ambient noise [dB(C)]	horn noise[dB(C)]		result [dB(C)]	remark
				measured	compensated		
1							
2							

Tested by:

Checked by:

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[Form No. 27-2]

Noise Test Report (ECE)

1. Test method
   O. pass-by noise is performed according to the test procedures (ECE).
2. Test Date:
3. Details of Test Vehicle

Item	Details	Item	Details
Name of vehicle		Manufacturer(country)	
Vehicle class		VIN	
Type		Engine No.	
Engine Type		Max. output(PS/rpm)	
Chassis type		Max. torque(Nm/rpm)	
Displacement(cc)		Engine RPM (Pmax 3/4, rpm)	
Model year		Engine RPM (Pmax 1/2, rpm)	
Transmission type and No. of gears		Engine location	
Reduction ratio		Number of axles	
Driving axle		Number of driving axles	
Curb weight(kg)		PMR (kW/t)	
Test weight(kg)		Partial output coefficient (K_p)	
Vehicle length		Tire size and tread depth	
Dynamic rolling circumference of tire(m)		Tire pressure (kPa)	
Type of silencer, mounting location, No.		Horn type and No.	
kickdown operation		Vehicle length	
Others			

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4. Test site condition

Item	Details	Item	Details
Location		Weather	
Orientation		Wind speed	
Ambient humidity		Ambient presure	
Ambient temp.		Other	

5. Noise Test Equipment

Item	Manufacturer	Type	Equip. No.	Calibration date
Sound level meter				
Calibrator				
Vehicle speed tester				
rpm tester				
meteorological test equipment(wind speed temp.)				
Recording device				N/A

6. Pass-by noise test results

Tested Vehicle weight (kg)				Vehicle load (kg)			
Gear selected (i)				Gear selected (i+1)			
Target acceleration (a_{urban} m/s^2)			Reference acceleration ($a_{wot\ ref}$, m/s^2)				
Measured acc. (, m/s^2)				Partial power factor (k_p)		Weight factor(k)	
Gear	Test	Pass-by					Stationary

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		Left	Right	Initial Speed ($V_{AA'}$)	Med. Speed ($V_{PP'}$)	Exit Speed ($V_{BB'}$)	Exit RPM ($N_{BB'}$)	Acc. ()	Starting point of acceleration	Left	Right
		dB(A)	dB(A)	kph	kph	kph	rpm	m/s©÷	m	dB(A)	dB(A)
	1st										
	2nd										
	3rd										
	4th										
	1st										
	2nd										
	3rd										
	4th										

Med. result :	Pass-by noise (L_{WOTrep}) dB(A)		Stationary noise (L_{CRSrep}) dB(A)
Final result :	L_{URBAN}(dB(A))	Final result :	L(dB(A))

Tested by:

Checked by:

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[Table 28]

OBD Deficiencies Improvement Plan

1. General specifications

Name of vehicle	Type	Class	Fuel used	Gearbox (No. of gear)	GVW (Curb weight) (kg)

2. Emission control system and OBD

P/N of catalyst (mfr)	Secondary air system	EGR
	Yes □ No □	Yes □ No □
P/N of ECU (mfr)	P/N of oxygen sensor (mfr)	P/N of purge control valve (mfr)

3. OBD Family

Name of vehicle (type)	Type of engine	Displacement (cc)	Max. output	Gearbox (No. of gear)	GVW (Curb weight) (kg)

4. OBD deficiency

No.	OBD monitoring item	Technique applied to monitoring item
1		
2		

5. Attachment

(1) Detailed description of deficiency

(2) Detailed improvement plan

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[Form No. 29]

(not translated – Form for omission of certification)

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[Form No. 30]

Test Staffs and Test Facilities

Test Staffs

Job title	Name	ID number	No. of years in service	Technical license	Job in charge

Remark: For foreign manufacturers any identification number used in their country may be quoted in place of 'ID number', and career in the appropriate field may be substituted for 'Technical license'.

Facilities

Name of equipment	Model	No. of unit	Manufacturer	Type Approval No.	Used for

Remark: 1. For foreign manufacturers facility validation by the Korean MOE may be substituted for 'Type Approval No.'.
2. Calibration records shall be submitted.

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[Form No. 31]

Test Staffs and Test Facilities - Change

Test Staffs

Job title	Name	ID number	Technical license	Change	Reason of change

Remark: For foreign manufacturers any identification number used in their country may be quoted in place of 'ID number', and career in the appropriate field may be substituted for 'Technical license'.

Facilities

Name of equipment	Model	Manufacturer	Change	Reason of change

Remark: 1. For foreign manufacturers facility validation by the Korean MOE may be substituted for 'Type Approval No.'.
2. Calibration records shall be submitted.

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[Form No. 32]

Certificate for Test Staffs and Test Facilities

(1) Name of Co.		(2) Name (Representative		(3) Business registration No.	
(4) Address				(5) Tel. No.	
(6) List of Test Staffs and Test Facilities					
Location	Test Staffs	Test facilities	Scope of test		
	((NAME) and ? persons)		(periodic test, spot test, certification test)		

This is to certify that the above test staffs and test facilities are qualified for the tests pursuant to Article 50 of Atmospheric Environment Preservation Act.

(date)

Minister of Ministry of Environment

©KAIDA

[Form No. 35]

Periodic Test Report

( )month, or (/) quarter

Test date:

Vehicle details

Certification No. (date of certification):

Name of vehicle:

Type of vehicle (shape):

Displacement (gearbox):

Manufacture/import statistics

This month/this quarter

Production:

Stock:

Production to date/Sales to date:

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[Form No. 35]

Test date	Vehicle information				Manufacture/import statistics			Test method			Engine or VIN	Test results											Accept/ Reject
	Cert. No. (date of cert.)	Vehicle name	Type (shape)	Disp. (gear box)	This month/this quarter		Production to date/sales to date	Lot size/No. of consecutive lots passed	Sample size	No. of units exceeding standards		Emission								Noise			
					Production	Stock						CO	HC	NOx	Smoke	Evap.	HC + Nox	PM	CO2	Pass-by	Stationary	Horn	

Periodic Test Report

( )month, or (/) quarter

Message

From: Covadonga.ASTORGA-LLORENS@ec.europa.eu [Covadonga.ASTORGA-LLORENS@ec.europa.eu]
Sent: 10/24/2017 8:37:25 AM
To: Olechiw, Michael [olechiw.michael@epa.gov]
Subject: RE: Information for the announcement of your talk Friday 27 October

Good morning Michael
If you agree I will will announce your talk as follows:

US-EPA Insight mandates for regulatory program development. EPA's regulation of Greenhous Gas emissions from light-duty vehicles and the on-going Midterm Evaluation.

Abstract:

The United States Environmental Protection agency has a long history of regulating mobile sources of air pollution. This history is based on broad stakeholder engagement and the ability to force technology into the market reduce emissions. This presentation will provide insight the mandates under which EPA conducts its regulatory program development. In addition, information will be provided regarding EPA's regulation of Greenhous Gas emissions from light-duty vehicles and the on-going Midterm Evaluation.

M. C. ASTORGA LLORENS, PhD.
Scientific Officer
European Commission
Joint Research Centre
Sustainable Transport Unit
TP 441
I-21027 Ispra (Italy)
+39 0332 78 6110/ +393497660015
covadonga.astorga-llorens@ec.europa.eu

From: Olechiw, Michael [olechiw.michael@epa.gov]
Sent: 23 October 2017 18:15
To: ASTORGA-LLORENS Covadonga (JRC-ISPRA); andrew.giallonardo@canada.ca
Subject: RE: Information for the announcement of your talk Friday 27 October

Hello Cova,

Sorry for the late delivery.

Abstract:

The United States Environmental Protection agency has a long history of regulating mobile sources of air pollution. This history is based on broad stakeholder engagement and the ability to force technology into the market reduce emissions. This presentation will provide insight the mandates under which EPA conducts its regulatory program development. In addition, information will be provided regarding EPA's regulation of Greenhous Gas emissions from light-duty vehicles and the on-going Midterm Evaluation.

I hope this is enough.

See you Thursday!

Mike

Michael R. Olechiw
Director - Light-duty Vehicles and Small Engines Center
USEPA/OTAQ/ASD
2000 Traverwood Drive
Ann Arbor MI 48105
Tel: +1-734-214-4297
Mobile: +1-734-546-8079
Fax: +1-734-214-4050
olechiw.michael@epa.gov

From: Covadonga.ASTORGA-LLORENS@ec.europa.eu [mailto:Covadonga.ASTORGA-LLORENS@ec.europa.eu]
Sent: Tuesday, October 17, 2017 4:49 PM
To: andrew.giallonardo@canada.ca; Olechiw, Michael <olechiw.michael@epa.gov>
Subject: Information for the announcement of your talk Friday 27 October

Dear Andrew and Michael,

On your arrival the taxi will take you to meeting room Tintoretto where we will spend part of the day and your luggage will be safe until
the taxi takes you to hotel in the afternoon.

I am preparing an announcement for the seminar/ talk on Friday 27th.
i would like you to propose a title for your respective talks (20/30 min each) that will be followed by a round table of questions and answers.
If you would please send me :
Title of the talk + short abstract (250 - 400 words) and a very short CV (aprox 400 words), I would be very grateful.
As we briefly discussed, any topic of your choice related to your country/ legislation and your field of expertise, would be very much appreciated.

I should prepare the announcement before Monday 23rd so, if you send your info anytime before, it should be great.
Looking forward to see you in JRC
Best
Cova

M. C. ASTORGA LLORENS, PhD.
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I-21027 Ispra (Italy)
+39 0332 78 6110/ +393497660015

covadonga.astorga-llorens@ec.europa.eu

From: Giallonardo, Andrew (EC) [andrew.giallonardo@canada.ca]
Sent: 17 October 2017 13:53
To: MASSA Marco (JRC-ISPRA); olechiw.michael@epa.gov; MacAllister.Julia@epa.gov; safoutin.mike@epa.gov; salazar-greene.natalie@epa.gov
Cc: Iffland.JoNell@epa.gov; ASTORGA-LLORENS Covadonga (JRC-ISPRA); PAFFUMI Elena (JRC-ISPRA); Louis-Seize, Catherine (EC)
Subject: RE: Transports confirmation for your visit to JRC on 26 and 27 October

Thanks Marco,

I think that works for me. I assume there will be somewhere at JRC to store our bags on the 26th before we go to the hotel at the end of the day given the highlighted schedule below?

Thanks,
Andrew

From: Marco.MASSA@ec.europa.eu [mailto:Marco.MASSA@ec.europa.eu]
Sent: October 17, 2017 5:21 AM
To: olechiw.michael@epa.gov; MacAllister.Julia@epa.gov; safoutin.mike@epa.gov; salazar-greene.natalie@epa.gov; Giallonardo, Andrew (EC)
Cc: Iffland.JoNell@epa.gov; Covadonga.ASTORGA-LLORENS@ec.europa.eu; elena.paffumi@ec.europa.eu
Subject: Transports confirmation for your visit to JRC on 26 and 27 October

Dear Mr Olechiw, Safoutin, Giallonardo,
With the following I want confirm your transports for your visit at JRC on 26 and 27 October.
I booked for you the following transports:

26.10: pick up at your arrival in Malpensa and transport to JRC (building 44, meeting room Tintoretto).
Please address at Exit 3 where a driver will be waiting for you (he will hold a paper indicating JRC ISPRA). If any problem may arise you can call the following number: +39 345 2515035 .
26.10: transport from JRC (building 44) to Laveno at Hotel de Charme where I booked 1 nights' accommodation for Mr Olechiw, 2 for Mr Safoutin and Mr Giallonardo)

27.10: transport from Hotel de Charme in Laveno to JRC: departure at 08:30
27.10: - transport from JRC to Hotel de Charme in Laveno (Safoutin, Giallonardo): departure at 17:30
- Transport for Mr Olechiw to Central Station in Milan to take the 8.40 PM train to Vienna: departure at 17:30

28.10: transport from Hotel de Charme in Laveno to Malpensa airport (Safoutin, Giallonardo) according to the flight schedule indicated.
Departure time to be confirmed the day before or call +390332789558 / +393452515035)

If you have any question please let me know. Please let me know if the mentioned pick up times are coherent with the purpose and needs of your visit.
Regards,

Marco Massa

From: Olechiw, Michael [mailto:olechiw.michael@epa.gov]
Sent: Thursday, September 21, 2017 2:09 PM
To: MacAllister, Julia; Safoutin, Mike; Salazar-Greene, Natalie
Cc: Iffland, JoNell; MASSA Marco (JRC-ISPRA); ASTORGA-LLORENS Covadonga (JRC-ISPRA)
Subject: FW: entrance permits and transpors for your visit to JRC on 26 and 27 October

Julia,

Could you work with Marco to get him the information he requires?

Thanks,

Mike

From: Marco.MASSA@ec.europa.eu [mailto:Marco.MASSA@ec.europa.eu]
Sent: Thursday, September 21, 2017 4:52 AM
To: olechiw.michael@epa.gov>
Cc: Ewelina.SUJKA@ec.europa.eu; Covadonga.ASTORGA-LLORENS@ec.europa.eu; elena.paffumi@ec.europa.eu
Subject: entrance permits and transpors for your visit to JRC on 26 and 27 October

Dear Mr Olechiw, Mr Giallonardo,
My Name is Marco Massa and I have been asked by Mrs Astorga and Paffumi to give your assistance in organising your 2 days visit at JRC Ispra on 26th and 27th October.

I booked 3 hotel rooms (for you and for your colleague, Mr Mike Safoutin of whom I don't have the email) at Hotel de Charme in Laveno. IN 26.10 out 28.10.

Due to the fact that JRC is a nuclear site, strict security procedure applies. In this view I need to request entrance permits for your 2 days visit. To start the procedure I kindly ask you to send me a scan copy of your passports (3 of you, and if applicable to other potential participants).
Moreover, I enclose an excel table where, at your convenience, you can send me your flight schedule so that I can arrange transportations from/ to the airport and local transports hotel/ JRC and return). Please consider that form next week I will be out of office during 2 weeks so you can refer to my colleague Ewelina Sujka in copy.
Thank you in advance!

Sincerely,

Marco MASSA

European Commission
Joint Reserch Centre
Directorate C: Energy, Transport & Climate
Unit 4: Sustainable Transport

Via Enrico Fermi 2749 - TP 230
I-21017 Ispra (VA) – Italy

Phone: +39.0332.78.94.03
Fax:+ 39.0332.78.66.71

E-mail: **marco.massa@ec.europa.eu**

JRC web site: https://ec.europa.eu/jrc

Message

From: Chorba, Carly [CChorba@hatci.com]
Sent: 11/2/2017 7:55:54 PM
To: Olechiw, Michael [olechiw.michael@epa.gov]
Subject: GHG Midterm Review and Post-2025 processes

Mike,

Amandine Muskus from Global Automakers forwarded your contact info to me. I am new to the HATCI team and am looking to set up a call time to discuss the current Midterm Review process and post-2025 regulatory process from the EPA standpoint. I previously worked under Cleophas Jackson at EPA NVFEL from 2013 to July of this year, before I came to HATCI. I look forward to hearing from you soon.

Best,

Carly Chorba
Hyundai Kia America Technical Center, Inc.
Environmental Regulatory Engineer
Regulation Department
6800 Geddes Rd, Superior Township, MI 48198
Work: (734) 337-2290
E-mail: cchorba@hatci.com

CUSTOMER CHALLENGE COLLABORATION PEOPLE GLOBALITY

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Message

From: Safoutin, Mike [safoutin.mike@epa.gov]
Sent: 9/8/2017 6:36:42 PM
To: gd_mathur@ck-mail.com
CC: Wysor, Tad [wysor.tad@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]
Subject: RE: Build-up of CO2 in Recirc Mode

Hello G.D.,

Thank you for the reminder, and I apologize that it has been difficult to identify a time for the on-site meeting you request. Tad and I have been extremely busy preparing for the public hearing on the Midterm Evaluation that took place in Washington D.C. on Wednesday. I will be attending and speaking at a conference most of next week, and Tad will be out until late September. Tad should be available after that, but my availability will continue to be limited in October due to official travel.

As I suggested before, I feel that Tad and I have a good understanding of the topic as described in your SAE paper and our previous discussions with Ward and Bill. Is there new information that you are planning to present? Given our limited availability, it may be most productive at this time to suggest specific topics that you propose to discuss, and to consider a teleconference if possible. Thanks,

Mike

From: gd_mathur@ck-mail.com [mailto:gd_mathur@ck-mail.com]
Sent: Wednesday, August 30, 2017 10:19 AM
To: Safoutin, Mike <safoutin.mike@epa.gov>
Cc: Wysor, Tad <wysor.tad@epa.gov>
Subject: RE: Build-up of CO2 in Recirc Mode

This message is classified as CK INTERNAL.

Good morning Mike:

I am following up on the subject matter. I was wondering if you have had your meeting? Please let me know? Can you send me your office and cell phone numbers? I have misplaced your business card.

Have a great day.

Best regards,

G.D. Mathur

This message is classified as CK INTERNAL.

From: Safoutin, Mike [mailto:safoutin.mike@epa.gov]
Sent: Monday, July 17, 2017 11:52 AM
To: GD Mathur <gd_mathur@ck-mail.com>
Cc: Wysor, Tad <wysor.tad@epa.gov>
Subject: RE: Build-up of CO2 in Recirc Mode

Hello G.D.,

Thanks for the note and the offer to meet. At the moment, I think we have sufficient understanding of the topic as you've described it, and coincidentally, we are scheduled to meet internally to discuss it next week. Assuming that you aren't planning to present us with new information not already represented in the paper or our previous discussions with Ward and Bill, I suggest that it would be most productive to wait until after that meeting, at which point either I or Tad will get in touch with you. Thanks,

Mike

From: gd_mathur@ck-mail.com [mailto:gd_mathur@ck-mail.com]
Sent: Friday, July 14, 2017 4:03 PM
To: Safoutin, Mike <safoutin.mike@epa.gov>
Subject: RE: Build-up of CO2 in Recirc Mode

This message is classified as CK INTERNAL.

HI Mike:

Hope you are doing well.

I am sorry we have not been able to meet or talk. Would you have some time in next two weeks? I am only 30 min form your office – I can see you at your office. Please let me know.

Best regards,

G.D. Mathur

This message is classified as CK INTERNAL.

From: Safoutin, Mike [mailto:safoutin.mike@epa.gov]
Sent: Tuesday, May 16, 2017 3:48 PM
To: GD Mathur <gd_mathur@ck-mail.com>
Cc: Wysor, Tad <wysor.tad@epa.gov>
Subject: RE: Build-up of CO2 in Recirc Mode

Hello G.D.,

Thanks for sending the paper. I was hoping to touch base with you during the SAE Congress and steering committee meeting, but unfortunately I was unable to attend at the last minute.

I think both Tad and I would be available for a brief conference call between about 3 and 5 either Wednesday or Thursday this week, if that works for you. Thanks,

Mike

From: gd_mathur@ck-mail.com [mailto:gd_mathur@ck-mail.com]
Sent: Monday, May 15, 2017 7:57 PM
To: Safoutin, Mike <safoutin.mike@epa.gov>
Subject: RE: Build-up of CO2 in Recirc Mode

This message is classified as CK INTERNAL.

Hi Michael – Please let me know if you have some time this week for a quick conference call.

This message is classified as CK INTERNAL.

From: GD Mathur
Sent: Monday, April 03, 2017 9:56 AM
To: Michael Safoutin <Safoutin.Mike@epa.gov>
Subject: Build-up of CO2 in Recirc Mode

This message is classified as CK INTERNAL.

Good morning Mike:

If you recall, I had met you at TMSS in Phoenix. I had a presentation on the subject matter. I would like to meet you this month at your office. Can you please let me know when would you be available for a meeting?

This week I will be at Cobo Hall to attend SAE's technical committee meetings along with attending technical sessions. I have published a paper with Bill Hill and Ward Atkinson on the subject matter. Please see attached.

Looking forward to hear from you.

Best regards,

G.D. Mathur, Ph.D., P.E.
Fellow of SAE, ASHRAE & ASME
Technical Specialist, Climate Control
Sr. Manager, Development Engineering
Farmington Hills, MI 48331
Phone Desk 248-848-4855; Cell Ex. 6 Personal Privacy (PP)

This message is classified as CK INTERNAL.

Message

From: Olechiw, Michael [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9F564B92FF96459AB606EB66E5892E2D-OLECHIW, MICHAEL]
Sent: 5/19/2017 6:43:42 PM
To: Jürgen Stockmar [j.stockmar@aon.at]
Subject: RE: Vienna Engineering EMB

Hr. Stockmar,

Sorry for the delay in my response. Thank you very much for meeting with me and the follow-up documents.

At this time I believe that we have several follow-up action items:

1. Discuss modelling the benefits of zero drag brakes in EPA full vehicle simulation model ALPHA.
2. Obtain brake wear particulate matter emissions estimates.
3. Link to the USEPA Midterm Evaluation
4. Code of Federal Regulations governing the treatment of Confidential Business Information

I did begin discussions regarding your technology with my staff and after they have had some time to digest the information I would like to schedule a follow-up meeting.

I hope you have a wonderful weekend.

Best Regards,

Michael R. Olechiw
Director - Light-duty Vehicles and Small Engines Center
USEPA/OTAQ/ASD
2000 Traverwood Drive
Ann Arbor MI 48105
Tel: +1-734-214-4297
Ex. 6 Personal Privacy (PP)
Fax: +1-734-214-4050
olechiw.michael@epa.gov

From: Jürgen Stockmar [mailto:j.stockmar@aon.at]
Sent: Tuesday, May 02, 2017 3:38 AM
To: Olechiw, Michael <olechiw.michael@epa.gov>
Subject: Vienna Engineering EMB

Dear Mr. Olechiw,

I hope that in the meantime you have arrived safely at home in Ann Arbor.

I would like to thank once again for the very interesting discussion with you about our electro-mechanical brake. I am attaching the longer technical info paper and a list of patents which have been granted so far.
As I already pointed out we applied for a number of additional patents, predominantly for the new true zero drag mechanism.

We would be glad to answer additional questions from you.

Best regards

Juergen Stockmar

Jürgen Stockmar
Prof. DI. Dr.h.c.
Consultant to
Vienna Engineering GmbH
Heiligenstädter Lände 29/5
A 1190 Wien
Austria
Ex. 6 Personal Privacy (PP) **mobil**
+43 1 5134513 land line
www.vienna-engineering.com
j.stockmar@aon.at

Appointment

From: Olechiw, Michael [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9F564B92FF96459AB606EB66E5892E2D-OLECHIW, MICHAEL]
Sent: 6/14/2017 10:02:08 PM
To: Tamm, James (NHTSA) [james.tamm@dot.gov]

Subject: Accepted: MECA on MY 2022-2025 CAFE
Location: DOT HQ and Conference Call

Start: 6/15/2017 5:00:00 PM
End: 6/15/2017 6:00:00 PM

Recurrence: (none)

Appointment

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 1/30/2018 2:20:12 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Charmley, William [charmley.william@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Moran, Robin [moran.robin@epa.gov]; Alson, Jeff [alson.jeff@epa.gov]; Burch, Julia [Burch.Julia@epa.gov]; Orlin, David [Orlin.David@epa.gov]; Kataoka, Mark [Kataoka.Mark@epa.gov]

Subject: Meet with VNG Co re: natural gas vehicles program (Confirmed)
Attachments: Updated VNG Comments on EPA-HQ-OAR-2015-0827.pdf; NGV Executive Action Summary.docx; RE: Meeting Request re: Natural Gas Vehicles; Confirmed 1/30 at 4pm: Meeting Request re: Natural Gas Vehicles; RE: Confirmed 1/30 at 4pm: Meeting Request re: Natural Gas Vehicles; EPA Memo 1.26.18.pdf; A Regulatory Reform Agenda for NGVs v2 (002).pdf; EPA presentation Dec 14 vF.PDF
Location: WJC-N 5400 + Video with AA Room C174

Start: 1/30/2018 9:00:00 PM
End: 1/30/2018 9:45:00 PM
Show Time As: Tentative

Materials attached (last three PDFs)
To: Bill Wehrum, Mandy Gunasekara, Chris Grundler, Bill Charmley, Ben Hengst, Robin Moran, Jeff Alson, Julia Burch, David Orlin, Mark Kataoka
Outside Attendees (in person):

- Robert Friedman, COO
- Bob Atkinson, Chief Regulatory Officer
- Larry Highbloom, Chief Administrative Officer
- Susan Lent, Akin Gump
- Jamie Tucker, Akin Gump

A Regulatory Reform Agenda for NGVs

A fast-track rulemaking to reform natural gas vehicle (NGV) incentives can be accomplished simply. The reforms necessary to achieve this goal are straightforward and fully justified by the game-changing environmental benefits of NGV technology, including the use of renewable natural gas (RNG), the potential for high-efficiency engines, and synergies with hydrogen fuel cell vehicles. We recommend four actions:

- **Restore 0.15 Divisor:** NGV emissions calculations should return to the "0.15 divisor" effective immediately, with emissions calculated as 85% below a gasoline vehicle (as was the case before 2016). This is justified by the game-changing real-world emissions benefits of RNG, and is moreover harmonized with Congressionally-mandated incentives under the CAFE program.

  We recommend reinstating language from the MY 2011-2016 regulations under 40 C.F.R. § 600.510–12, Calculation of average fuel economy and average carbon-related exhaust emissions.

- **Remove Dual-Fuel Design Requirements:** EPA should remove the utility factor requirements for a 2:1 ratio of CNG-to-gasoline range, as well as the requirement for dual-fuel NGVs to only use gasoline when the CNG tank is empty. These unnecessary design requirements add cost and reduce the appeal of these vehicles to consumers, and analogous plug-in hybrid electric (PHEV) vehicles face no such requirements despite having far lower driving range on electricity (<40 miles) compared to the typical natural gas range of a dual-fuel NGV pickup (250+ miles).

  This could be achieved by deleting the requirements in 40 C.F.R. § 600.510–12, Calculation of average fuel economy and average carbon-related exhaust emissions, part (c)(2)(vii)(B) for fuel economy and (j)(2)(vii)(B) for emissions.

- **NGV Pickup Incentive:** EPA has recognized the unique challenges facing full-sized pickups, and natural gas could be the ideal low-emission platform for these vehicles. This could be encouraged by offering a "Natural Gas Pickup" incentive similar to current hybrid-electric and "performance-based" pickup incentives; however, for the natural gas pickup credit, minimum deployment thresholds (10% of all full-size pickups for existing credits) should be eliminated to reflect the greater market challenges faced by NGVs - since, unlike hybrids, they use an alternative fuel.

  This could be accomplished by inserting a new section (c) under 40 C.F.R. § 86.1870–12, CO2 credits for qualifying full-size pickup trucks, titled "Credits for implementation of natural gas technology." The structure of these credits would be similar to those for sections (a) and (b), but without requirements for the "required minimum percent of full size pickup trucks."

- **Recognize Retrofits:** Encouraging retrofits of older gasoline vehicles to run on CNG is slightly more complex, but offers a unique opportunity to reduce vehicle emissions throughout their useful life instead of just at the point of sale. EPA should allow certified converters to "opt in" to the program and generate credits for CNG retrofits and upfits, prorated in proportion to their remaining useful life. Retrofits could also be encouraged by providing credits for CNG "prep packages" that reduce the costs of subsequent conversion to natural gas, as part of the off-cycle credit technologies menu listed at *40 C.F.R. § 86.1869–12, CO2 credits for off-cycle CO2-reducing technologies.*

For further info: Robert Atkinson, Chief Reg. Officer, VNG. rcatkinson@vng.co; 908-447-4201

VNG

ARIEL

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 1/10/2018 1:47:37 PM
To: Tucker, Jamie [jtucker@AKINGUMP.COM]
CC: Feeley, Drew (Robert) [Feeley.Drew@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]
Subject: Confirmed 1/30 at 4pm: Meeting Request re: Natural Gas Vehicles

Hi Jamie,
You are confirmed for a 45 minute meeting on Tuesday, January 30, 2018 at 4:00pm with Bill Wehrum. Directions and procedures to 1200 Pennsylvania Avenue NW:

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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

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Subject: RE: Meeting Request re: Natural Gas Vehicles

That's terrific and will work on our end. I will follow up shortly with a complete list of attendees on our part, but let's go ahead and book it.

Thanks.

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Subject: Meeting Request re: Natural Gas Vehicles

Emily/Josh - On behalf of VNG.Co, a natural gas vehicle fueling infrastructure company, we wanted to see if Assistant Administrator Wehrum would be available this month to discuss a number of administrative and legislative policy changes the company is advocating to promote the adoption of natural gas vehicles largely by leveling the playing field with electric vehicles. We have had recent conversations with the Office of Policy as well as the Office of Transportation and Air Quality to discuss these proposals as well as with staff at the White House and Department of Transportation. With Mr. Wehrum's confirmation we would like to fold him into the conversation as well.

Natural gas vehicles provide a cost effective and additional pathway for automaker emissions compliance while preserving the products' consumer appeal, and are therefore worthy of being included in a portfolio of solutions along with EVs to achieve the objectives.

Among the key advantages of the proposed regulatory changes is the benefit to achieving emissions reductions in the light-duty truck category which accounts for 64% of new vehicle purchases (and are responsible for even greater amounts of fuel use and pollution if you take into account the differential in fuel economy between light-duty trucks and passenger cars), and for which there is not a viable electrification solution.

Specifically, we would encourage the Administration to consider:

- **Restoring the 0.15 "divisor"** in EPA's compliance calculations, equivalent to NHTSA's statutory Petroleum Equivalency Factor that counts a gallon-equivalent of natural gas as 0.15 gallons of gasoline. The previous Administration ended this powerful incentive while simultaneously providing electric vehicles with additional emissions incentives on the hope that EVs would be "game changers." The game has now changed for NGVs. The shale revolution that has occurred since the current rules were set as well the development of Renewable Natural Gas as the lowest carbon vehicle fuel are true game changers that strongly justify returning to the 0.15 divisor.

The powerful and well-justified incentive of the 0.15 divisor would be complemented and made even more effective by additional changes including:

- **Eliminating range requirements on bi-fuel NGVs** that results in an impractical natural gas tank size requirement that is twice the size of the gasoline tank and costly design requirements for NGVs, whereas no such range requirements exists for hybrid electric vehicles. This is the most important regulatory change as a complement to the 0.15 divisor of the three.

- **Providing NGV pick-ups with the bonus credits** provided to "strong electric hybrid pick-ups" and **eliminating the existing minimum 10% deployment threshold** to qualify for pickup bonus credits.

- **Establishing a new incentive to encourage retrofitting existing gasoline and diesel vehicles to run on natural gas**, something that isn't feasible for electric drives but which will reduce emissions by the existing fleet of vehicles

Enclosed for your further consideration are our Midterm Evaluation comments as well as information outlining the rationale for the recommended regulatory changes.

Thank you for your consideration.

Jamie

Jamie Tucker
AKIN GUMP STRAUSS HAUER & FELD LLP
1333 New Hampshire Avenue, N.W. | Washington, DC 20036-1564 | USA | Direct: +1 202.887.4279 | Internal: 24279
Fax: +1 202.887.4288 | jtucker@akingump.com | akingump.com | Bio

The information contained in this e-mail message is intended only for the personal and confidential use of the recipient(s) named above. If you have received this communication in error, please notify us immediately by e-mail, and delete the original message.
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A Rulemaking to Unlock the Potential of Natural Gas Vehicles

During the previous administration, EPA pushed automakers to manufacture light duty electric vehicles (EVs) as a means of meeting fuel economy and emission standards, ignoring the benefits of natural gas vehicles (NGVs). Not only did EPA remove the NGV incentives provided by Congress under the law, it failed to consider NGV technology development, the full impact of the shale revolution, or the growth of renewable natural gas (RNG) in its Technical Assessment Report on the regulations.

Natural gas is an abundant resource and is uniquely suited as a fuel for light trucks, which make up 64% of the passenger vehicle market and an even greater percentage of fuel use and pollution due to their lower fuel economy. EVs, on the other hand, are limited to lighter weight and luxury passenger cars. With automakers struggling to meet emissions standards, it is critical that EPA provide alternative compliance options, including incentivizing automakers to add NGVs to their product lines.

EPA can solve this urgent problem with a rulemaking to reform light-duty vehicle regulations for NGVs. With appropriate support, NGVs can deliver these much-needed benefits:

- **Game-Changing Lifecycle Emissions:** NGVs reduce greenhouse emissions by up to 25% with fossil natural gas and can achieve *negative* lifecycle emissions with RNG from landfills, dairy farms, and other sources. With 35% of NGV fueling coming from RNG already, these vehicles are clearly delivering game-changing emissions on par with EVs – and should be incentivized as such.
- **Alternative Fuel for Light Trucks:** EVs are an option for small cars, but battery cost and weight are prohibitive for electrifying larger vehicles like pickups and light trucks. By contrast, NGVs are a proven alternative for light trucks, with both OEM and conversion-certified pickup models as well as bi-fuel configurations that can run on gasoline (key for addressing "range anxiety" for early adopters).
- **Cleaning Up Older Vehicles:** While it's impossible to electrify existing vehicles, they *can* be converted to natural gas – as in states like Oklahoma and Utah that have encouraged thriving retrofit industries. Automaker support of NGVs will reduce retrofit costs and presents a unique opportunity to reduce emissions from the highly polluting used vehicle fleet and expand the benefits of the rules.
- **Economic Benefits:** In addition to the environmental benefits of NGVs, they offer the opportunity to bolster economic growth in the automotive industry, the natural gas industry, and even the agriculture and waste industries, which can benefit from the production and sale of RNG fuel.

The fact that the considerable benefits of NGVs have been previously ignored by EPA is reason enough to convene a rulemaking as proposed by VNG last year in its Regulatory Reform comments, instead of waiting for the Mid-Term Evaluation. Another compelling reason to fast-track these reforms is to unlock a win-win compromise by expanding the portfolio of low-emission solutions for automakers beyond EVs.

- **Breaking Through the Logjam on Vehicle Rules:** Automakers need a reform of the rules because they currently have no cost-effective way to meet their emission targets for pickups and light trucks, which are essential to their economic health. Meanwhile, California policymakers are demanding that the targets remain, threatening years of legal uncertainty and a fractured regulatory landscape.

NGVs are the missing piece of the puzzle. The massive environmental benefits of RNG have already been acknowledged by the California Air Resources Board, and the potential of NGVs as a light truck alternative have already been demonstrated by automakers. By reforming regulations to recognize the benefits of NGVs (and harmonize with CAFE incentives in the process), EPA can provide automakers a cost-effective compliance option for light trucks. This would help the environment *and* the economy, through job creation, GDP growth, and trade deficit reduction.

For further info: Robert Atkinson, Chief Reg. Officer, VNG. rcatkinson@vng.co; 908-447-4201

VNG

ARIEL

NGVs, Light Trucks, & the Mid-Term Evaluation

Meeting with Environmental Protection Agency, 12/14/17

Robert Atkinson, VNG Chief Regulatory Officer
RCAtkinson@vng.co, 908-447-4201

Dec-17

VNG and Ariel – Who We Are

- VNG and Ariel are collaborating on this regulatory initiative
- Ariel is the largest manufacturer of reciprocating gas compressors in the world
- VNG builds CNG fueling for light- & medium-duty fleets at existing gasoline stations
  - High-visibility locations that are accessible, convenient, and consumer-friendly, with full service C-store retail amenities; major contrast to heavy-duty CNG private fleet depots, utility yards
  - Locations in Philadelphia, Houston, Dallas, and Milwaukee
  - Discussions with major light-duty fleet for fueling in California (operates ~4,000 NGVs in state)
- VNG has been a leading voice for light-duty NGVs, cited in original 2017-2025 rule

Expanding Compliance Options for Light Trucks

The Problem With Low Gasoline Prices

- As noted in TAR, market shift towards light trucks reduces aggregate emissions benefits of regulations, even if individual OEM targets adjust to compensate
- Battery cost and weight means no EV pickups for foreseeable future – the OEMs' most popular, profitable, and polluting vehicles

NGVs Could Be The Solution – With EPA Support

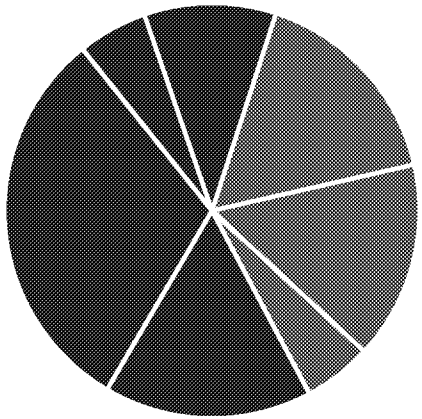
- NGVs have seen dramatic, game-changing reductions in lifecycle emissions since original rulemaking, thanks to major uptake of renewable natural gas (RNG)
- OEMs have already experimented with NGV pickups with limited production of Dodge Ram and Chevy Silverado bi-fuels, CNG-ready Ford F-150

With revised incentives that recognize rapid growth of RNG fueling, NGVs could be a key low-emission compliance pathway for light trucks for 2025 and beyond.

Shift To Light Trucks Eroding Benefits of Rules

YTD 2017 Sales

LIGHT TRUCKS
63% of YTD 2017 auto sales
+4.6% from YTD 2016



CARS
42% of YTD 2017 auto sales
-10.3% from YTD 2016

Source: Wall Street Journal

- Gasoline prices have plunged since rulemaking, shifting market to larger vehicles
- Not a current compliance problem for OEMs, since targets adjust to sales mix
- BUT shift will reduce aggregate emissions benefits of regulations
- Growing OEM concerns about limited compliance options for light trucks - and pickups especially

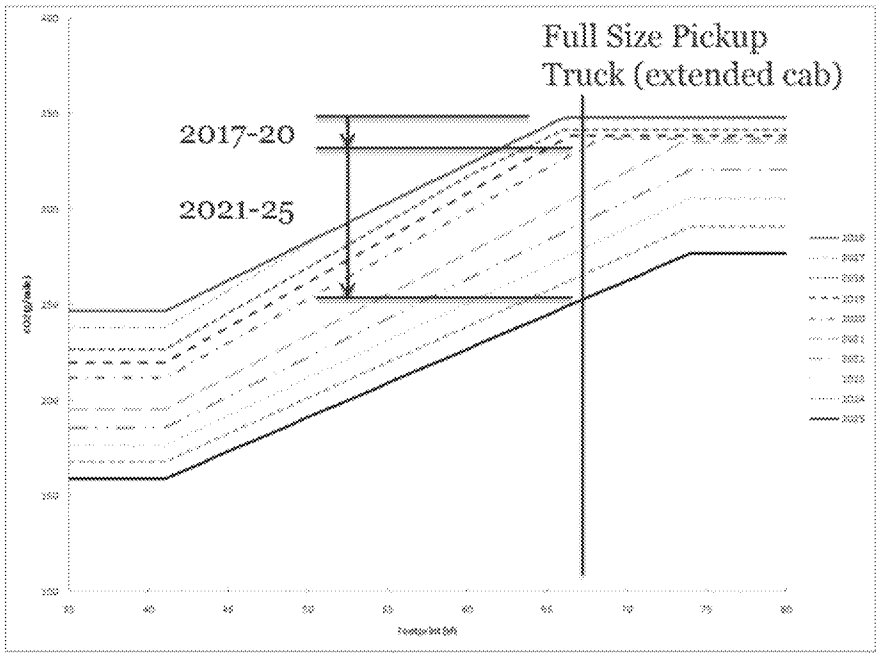
Emission Solutions for Pickups Most Urgently Needed

- Pickups are the top-selling vehicles, most profitable, and most polluting
- Pickups also face the most dramatic increase in CO2 emission requirements in 2021-2025 period – biggest challenge for automakers, few tech options

- No EV alternatives for foreseeable future (2025+) due to weight and utility requirements (2016 TAR)
- Natural gas (or natural gas-ready) versions of Chevy Silverado, Dodge Ram, and Ford F-150 have already been rolled out by OEMs

With support from EPA, NGVs could be best compliance pathway for automakers for light trucks for 2025 and beyond.

Figure I-4 CO2 (g/mile) Light-Truck Standard Curves



Source: Westport

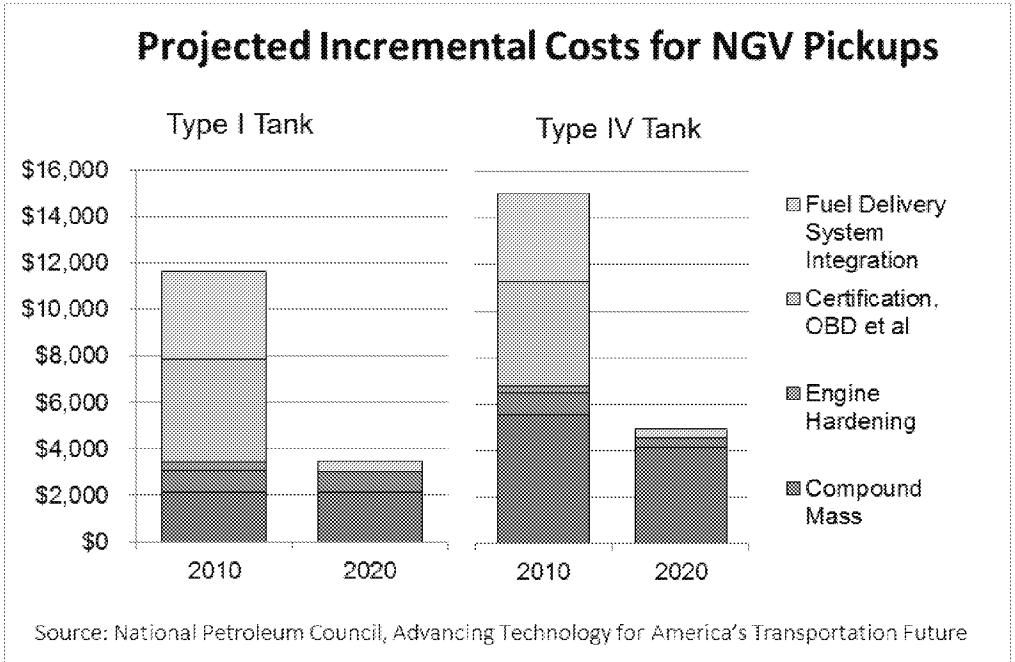
RNG: From 0% to 35% of NGV Fueling Since 2012

- **Original rulemaking:** *"Biomethane will remain a small part of the overall natural gas market for the foreseeable future"…*
- **Today:** Biomethane/RNG accounts for about 35% of national NGV fueling, 60% in California (Fleets & Fuels) – and growing as fast as RNG projects can come online
- **Why?** Regulations - and economics. RNG reclassified as cellulosic biofuel in 2014, RIN revenues of ~$23/MMBTU (UC Davis) make it more profitable than fossil.
  - —3x revenues from transportation vs electricity sales (CARB)
  - —California adds another $11+/MMBTU for LCFS sales (UC Davis)
- **Game-Changing Emissions:** Lowest carbon intensity of any fuel measured under California's Low Carbon Fuel Standard – **pathways up to -304 gCO2e/MJ** (CARB)

Economics of RFS and LCFS will ensure continued growth in RNG use for NGVs, and growth in NGV market will be primary driver of new RNG capture projects.

Major NGV Cost Reductions With Scale

- NGVs have far greater potential for rapid incremental cost reductions than EVs, as costs come from design/regulatory – not components (i.e. batteries)
- Fuel system integration + certification are >50% of NGV incremental costs (NPC)
- Fixed costs virtually eliminated overnight if spread over large number of vehicles
- Precedent in Europe (e.g. Italy), where OEM-produced NGVs retail for <$3,000 more than gasoline model (BCG)
- $3,000 is projected cost to lightweight pickup truck for 10% emissions improvement (TAR)
- NGVs offer comparable cost with much greater emission reduction



Advanced Tech for Ultra-Low NGV Pickup Emissions

- NGVs already commercial tech – but can be pushed much farther by taking advantage of high octane, clean-burning properties of gas
- Westport (Cummins JV partner) has proposed "Super Pickup Truck" NGV concept with >30% greater fuel economy, ultra-low NOx
- Advanced tank technologies (e.g. adsorption) another avenue of improvement
- Hybrid/Plug-In Hybrid pathway offers further potential emission reductions

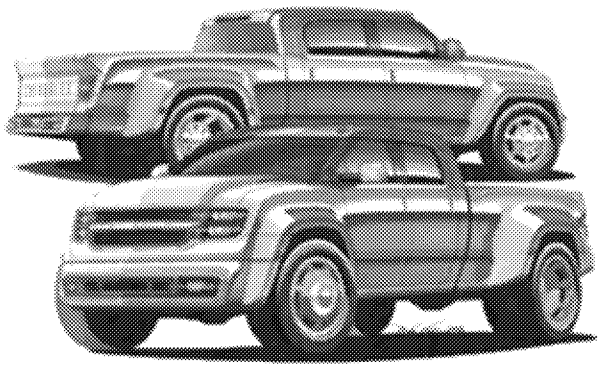
Advanced powertrains that fully exploit ultra high-octane low-carbon fuel properties of methane

a. Not been done to-date – missed opportunity

b. High efficiency and high performance at the same time, outperform gasoline and diesel

c. >30% CO2 reduction TTW

- Westport, "Methane: The Performance Fuel"

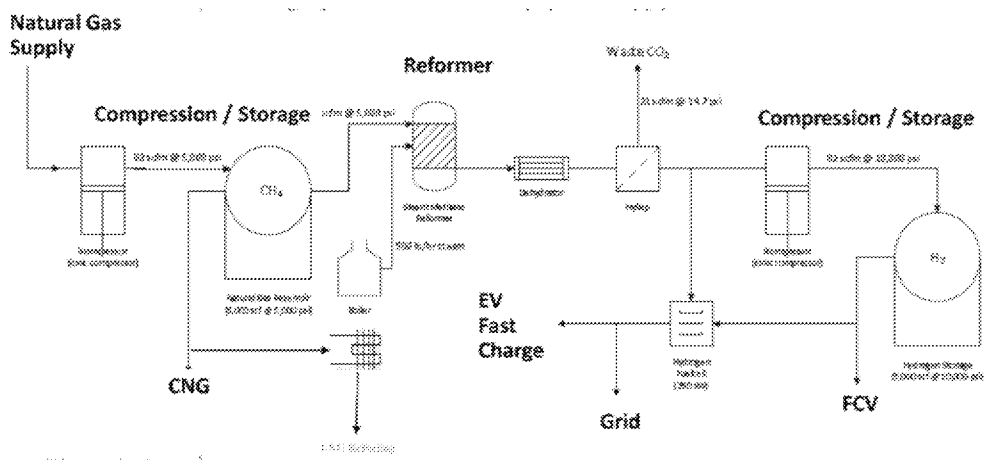


NGV Synergies With Hydrogen

- Vehicle synergy via gaseous fuel storage tech (e.g. adsorption tanks)
- CNG/H2 fueling can be combined, or else CNG stations can be transitioned to H2 at a later date due to shared components
- RNG is also fuel for ultra-low GHG H2 production – NGVs develop market for production infrastructure today for H2 fueling tomorrow

"Planning for the addition of H2 infrastructure at CNG fueling locations can facilitate the adoption of hydrogen at a later date and smooth the transition to near zero carbon technologies."

- **UC Davis STEPS Program**



Proposed Reforms to GHG Rules – 0.15 Divisor

Return to "0.15 divisor": Calculate CNG emissions as 0.15x gasoline emissions, as in the pre-MY 2016 GHG regulations

- Equivalent to 85% reduction, reflects game-changing lifecycle RNG emissions (some pathways achieve 100% or more)
- Analogous to EV 0 g/mi incentive that assumes 100% renewable electricity; instead, assumes 100% RNG use
  - *RNG use of 35% nationally and growing is equal to % of zero-carbon electricity (renewables + nuclear) in national mix*
- Like EV incentive, can be transitioned to real-world lifecycle emissions based on national RNG use (can use RFS data)
- Harmonizes with CAFE Petroleum Equivalency Factor (PEF)

A return to the 0.15 divisor could enable OEMs to achieve existing 2025 targets and establish NGVs as long-term compliance pathway for light trucks.

Proposed Reforms to GHG Rules – Dual-Fuel Design

Remove utility factor design requirements for dual-fuel NGVs: Eliminate need for 2:1 CNG-to-gasoline range ratio, use of gasoline only when CNG tank is empty

- Dual-fuel vehicles critical to building NGV market as fueling develops, like PHEVs
- Fastest, lowest-cost pathway is adding CNG tank to existing gasoline vehicle
- However dual-fuel NGVs face unique design requirements to receive utility factor, despite having much greater CNG range vs PHEV electric-only range
- Forces automakers to add cost (from shrinking and redesigning gasoline tank) and decrease total range and utility (from increased size of CNG tanks) if they want to receive full utility factor incentives
  - **Example:** FCA chose design simplicity over incentives with Dodge Ram dual-fuel, with 255 miles of CNG range and nearly 400 miles of gasoline range

These design requirements are as unnecessary for dual-fuel NGVs as for PHEVs, and will force OEMs to either limit consumer appeal or lose incentives.

Proposed Reforms to GHG Rules – Pickup Incentive

NGV Pickup Incentive: Create full-size pickup incentive equivalent to hybrid incentives for both dedicated and dual-fuel NGVs with **no** minimum penetration

- Cleaner technologies for pickups badly needed, but currently no projected use of existing full-size pickup advanced technology incentives (2016 TAR)
- NGVs are ideal next-gen pickup platform and could qualify for performance-based incentive (<15% emission reduction)…
- But 10% minimum penetration threshold too high for alternative fuel vehicles; too risky for OEMs to make big, immediate move in critical profit segment
- Removing threshold and awarding incentives for every NGV pickup would encourage OEMs to experiment, invest in new technology

NGV-specific incentive would surpass original goals of full-size pickup incentives by providing new platform for continuous, long-term efficiency improvements

Proposed Reforms to GHG Rules – Retrofits

Retrofit Credits: Create credits based on remaining useful life of converted vehicle: for instance, conversion of 5 year-old pickup would get credit for 50% emission reductions as a new vehicle; credits awarded to converter, can be sold to OEMs

- Vehicle life steadily increasing beyond 10 years, likely to continue growing as vehicle prices increase – how to avoid erosion of program benefits?
- NGV retrofits offer pathway to reduce emissions from vehicles significantly during their useful life – very successful in Utah, Oklahoma
- These emission benefits not currently captured in (or incentivized by) rules
- Synergies with EPA reforms to certification rules in 2011
- Could also add off-cycle credits for CNG-ready "prep packages" (e.g. Ford F-150)

Incorporating retrofits is an "outside the box" solution that would accelerate progress and honor EPA mandate to regulate emissions throughout useful life

Action On NGV Light Trucks is Major Opportunity

Incentivizing NGVs as part of GHG rules ensures continued progress on not only emission reductions but on vehicle and fuel technologies:

- Introduces low-emission options for pickups a decade or more in advance of EV technologies in this segment
- Shifts trajectory of potential emissions improvements for light truck segment, allowing more ambitious post-2025 targets
- Pathway to near-zero emissions and beyond with advanced ICE engines, RNG, and hydrogen synergies
- Drives market for RNG capture, realizing massive lifecycle emission reductions and cost-effective waste recovery that compliments broader EPA agenda

Robert Atkinson, VNG Chief Regulatory Officer
RCAtkinson@vng.co, 908-447-4201

VNG

VNG

Natural Gas Vehicles (NGVs):
The Common Sense Solution To Achieving Emissions Reduction Compliance At Low Cost and Low Risk

NGVs ideally suited to help pickups, light duty trucks reach 2025 emissions goals

- Light duty trucks face biggest compliance challenge, are critical to Big Three future
- EVs not an option – batteries too expensive, too heavy for larger vehicles
  - NGVs are proven: Ford F150, Chevy Silverado, Dodge Ram

Correcting NGV incentives is straightforward – and justified

- No consideration of NGV technology in 2016 Technical Assessment Report despite availability of abundant domestic fuel and vehicle technology
  - Game-changing Renewable Natural Gas (RNG) delivers more than 85% lifecycle emission reductions
- Restore pre-2015 "0.15 divisor" to harmonize EPA with statutory CAFE incentives,
  - Parity with EV incentives: just as EV incentives reflect renewable energy, restoring 0.15 divisor for NGVs would reflect emissions benefits of RNG (85%)
  - Would allow OEMs to easily meet 2025 targets for pickups
- Parity: eliminate arbitrary driving range requirement imposed on bi-fuel NGVs
  - Plug-in hybrids have no requirements despite much shorter electric range
- Provide NGV pickups with same emissions credits as "Strong Hybrids"
  - Eliminate minimum penetration for NGV pickup incentives: NGVs as 10% of all pickups not immediately feasible for alt fuel like natural gas

Additional opportunity for smarter regulations: encourage retrofits

- Retrofitting deployed vehicles with natural gas reduces emissions of existing fleet
- Build on NGV retrofit successes in Oklahoma, greatly expand benefits of rules
- Allow converters to receive credits based on vehicle's remaining useful life, sell/transfer to OEMs

Restoring parity between NGVs and EVs, and between EPA and NHTSA, will provide automakers much-needed compliance flexibility for light trucks and pickups – and by making these changes effective immediately, we can start building this industry today.

Message

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CC: Feeley, Drew (Robert) [Feeley.Drew@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]
Subject: RE: Confirmed 1/30 at 4pm: Meeting Request re: Natural Gas Vehicles
Attachments: EPA Memo 1.26.18.pdf; A Regulatory Reform Agenda for NGVs v2 (002).pdf; EPA presentation Dec 14 vF.PDF

Please find below the list of attendees for tomorrow afternoon and I've also enclosed for your use a one-pager providing a brief overview as well as separate one-pager describing the four proposed regulatory changes. Lastly, I've also enclosed a more in-depth presentation which we shared in December during a conversation with your team at OTAQ.

We are looking forward to meeting with Mr. Wehrum tomorrow and please let us know if you need any additional background in advance of the meetings.

Attending:
Robert Friedman, COO
Bob Atkinson, Chief Regulatory Officer
Larry Highbloom, Chief Administrative Officer

Susan Lent, Akin Gump
Jamie Tucker, Akin Gump

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
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Emily

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Subject: Meeting Request re: Natural Gas Vehicles

Emily/Josh - On behalf of VNG.Co, a natural gas vehicle fueling infrastructure company, we wanted to see if Assistant Administrator Wehrum would be available this month to discuss a number of administrative and legislative policy changes the company is advocating to promote the adoption of natural gas vehicles largely by leveling the playing field with electric vehicles. We have had recent conversations with the Office of Policy as well as the Office of Transportation and Air Quality to discuss these proposals as well as with staff at the White House and Department of Transportation. With Mr. Wehrum's confirmation we would like to fold him into the conversation as well.

Natural gas vehicles provide a cost effective and additional pathway for automaker emissions compliance while preserving the products' consumer appeal, and are therefore worthy of being included in a portfolio of solutions along with EVs to achieve the objectives.

Among the key advantages of the proposed regulatory changes is the benefit to achieving emissions reductions in the light-duty truck category which accounts for 64% of new vehicle purchases (and are responsible for even greater amounts of fuel use and pollution if you take into account the differential in fuel economy between light-duty trucks and passenger cars), and for which there is not a viable electrification solution.

Specifically, we would encourage the Administration to consider:

- **Restoring the 0.15 "divisor"** in EPA's compliance calculations, equivalent to NHTSA's statutory Petroleum Equivalency Factor that counts a gallon-equivalent of natural gas as 0.15 gallons of gasoline. The previous Administration ended this powerful incentive while simultaneously providing electric vehicles with additional emissions incentives on the hope that EVs would be "game changers." The game has now changed for NGVs. The shale revolution that has occurred since the current rules were set as well the development of Renewable Natural Gas as the lowest carbon vehicle fuel are true game changers that strongly justify returning to the 0.15 divisor.

The powerful and well-justified incentive of the 0.15 divisor would be complemented and made even more effective by additional changes including:

- **Eliminating range requirements on bi-fuel NGVs** that results in an impractical natural gas tank size requirement that is twice the size of the gasoline tank and costly design requirements for NGVs, whereas no such range requirements exists for hybrid electric vehicles. This is the most important regulatory change as a complement to the 0.15 divisor of the three.

- **Providing NGV pick-ups with the bonus credits** provided to "strong electric hybrid pick-ups" and **eliminating the existing minimum 10% deployment threshold** to qualify for pickup bonus credits.

- **Establishing a new incentive to encourage retrofitting existing gasoline and diesel vehicles to run on natural gas**, something that isn't feasible for electric drives but which will reduce emissions by the existing fleet of vehicles

Enclosed for your further consideration are our Midterm Evaluation comments as well as information outlining the rationale for the recommended regulatory changes.

Thank you for your consideration.

Jamie

Jamie Tucker
AKIN GUMP STRAUSS HAUER & FELD LLP
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A Regulatory Reform Agenda for NGVs

A fast-track rulemaking to reform natural gas vehicle (NGV) incentives can be accomplished simply. The reforms necessary to achieve this goal are straightforward and fully justified by the game-changing environmental benefits of NGV technology, including the use of renewable natural gas (RNG), the potential for high-efficiency engines, and synergies with hydrogen fuel cell vehicles. We recommend four actions:

- **Restore 0.15 Divisor:** NGV emissions calculations should return to the "0.15 divisor" effective immediately, with emissions calculated as 85% below a gasoline vehicle (as was the case before 2016). This is justified by the game-changing real-world emissions benefits of RNG, and is moreover harmonized with Congressionally-mandated incentives under the CAFE program.

  We recommend reinstating language from the MY 2011-2016 regulations under 40 C.F.R. § 600.510–12, Calculation of average fuel economy and average carbon-related exhaust emissions.

- **Remove Dual-Fuel Design Requirements:** EPA should remove the utility factor requirements for a 2:1 ratio of CNG-to-gasoline range, as well as the requirement for dual-fuel NGVs to only use gasoline when the CNG tank is empty. These unnecessary design requirements add cost and reduce the appeal of these vehicles to consumers, and analogous plug-in hybrid electric (PHEV) vehicles face no such requirements despite having far lower driving range on electricity (<40 miles) compared to the typical natural gas range of a dual-fuel NGV pickup (250+ miles).

  This could be achieved by deleting the requirements in 40 C.F.R. § 600.510–12, Calculation of average fuel economy and average carbon-related exhaust emissions, part (c)(2)(vii)(B) for fuel economy and (j)(2)(vii)(B) for emissions.

- **NGV Pickup Incentive:** EPA has recognized the unique challenges facing full-sized pickups, and natural gas could be the ideal low-emission platform for these vehicles. This could be encouraged by offering a "Natural Gas Pickup" incentive similar to current hybrid-electric and "performance-based" pickup incentives; however, for the natural gas pickup credit, minimum deployment thresholds (10% of all full-size pickups for existing credits) should be eliminated to reflect the greater market challenges faced by NGVs - since, unlike hybrids, they use an alternative fuel.

  This could be accomplished by inserting a new section (c) under 40 C.F.R. § 86.1870–12, CO2 credits for qualifying full-size pickup trucks, titled "Credits for implementation of natural gas technology." The structure of these credits would be similar to those for sections (a) and (b), but without requirements for the "required minimum percent of full size pickup trucks."

- **Recognize Retrofits:** Encouraging retrofits of older gasoline vehicles to run on CNG is slightly more complex, but offers a unique opportunity to reduce vehicle emissions throughout their useful life instead of just at the point of sale. EPA should allow certified converters to "opt in" to the program and generate credits for CNG retrofits and upfits, prorated in proportion to their remaining useful life. Retrofits could also be encouraged by providing credits for CNG "prep packages" that reduce the costs of subsequent conversion to natural gas, as part of the off-cycle credit technologies menu listed at *40 C.F.R. § 86.1869–12, CO2 credits for off-cycle CO2-reducing technologies.*

For further info: Robert Atkinson, Chief Reg. Officer, VNG. rcatkinson@vng.co; 908-447-4201

VNG

ARIEL

A Rulemaking to Unlock the Potential of Natural Gas Vehicles

During the previous administration, EPA pushed automakers to manufacture light duty electric vehicles (EVs) as a means of meeting fuel economy and emission standards, ignoring the benefits of natural gas vehicles (NGVs). Not only did EPA remove the NGV incentives provided by Congress under the law, it failed to consider NGV technology development, the full impact of the shale revolution, or the growth of renewable natural gas (RNG) in its Technical Assessment Report on the regulations.

Natural gas is an abundant resource and is uniquely suited as a fuel for light trucks, which make up 64% of the passenger vehicle market and an even greater percentage of fuel use and pollution due to their lower fuel economy. EVs, on the other hand, are limited to lighter weight and luxury passenger cars. With automakers struggling to meet emissions standards, it is critical that EPA provide alternative compliance options, including incentivizing automakers to add NGVs to their product lines.

EPA can solve this urgent problem with a rulemaking to reform light-duty vehicle regulations for NGVs. With appropriate support, NGVs can deliver these much-needed benefits:

- **Game-Changing Lifecycle Emissions:** NGVs reduce greenhouse emissions by up to 25% with fossil natural gas and can achieve *negative* lifecycle emissions with RNG from landfills, dairy farms, and other sources. With 35% of NGV fueling coming from RNG already, these vehicles are clearly delivering game-changing emissions on par with EVs – and should be incentivized as such.
- **Alternative Fuel for Light Trucks:** EVs are an option for small cars, but battery cost and weight are prohibitive for electrifying larger vehicles like pickups and light trucks. By contrast, NGVs are a proven alternative for light trucks, with both OEM and conversion-certified pickup models as well as bi-fuel configurations that can run on gasoline (key for addressing "range anxiety" for early adopters).
- **Cleaning Up Older Vehicles:** While it's impossible to electrify existing vehicles, they *can* be converted to natural gas – as in states like Oklahoma and Utah that have encouraged thriving retrofit industries. Automaker support of NGVs will reduce retrofit costs and presents a unique opportunity to reduce emissions from the highly polluting used vehicle fleet and expand the benefits of the rules.
- **Economic Benefits:** In addition to the environmental benefits of NGVs, they offer the opportunity to bolster economic growth in the automotive industry, the natural gas industry, and even the agriculture and waste industries, which can benefit from the production and sale of RNG fuel.

The fact that the considerable benefits of NGVs have been previously ignored by EPA is reason enough to convene a rulemaking as proposed by VNG last year in its Regulatory Reform comments, instead of waiting for the Mid-Term Evaluation. Another compelling reason to fast-track these reforms is to unlock a win-win compromise by expanding the portfolio of low-emission solutions for automakers beyond EVs.

- **Breaking Through the Logjam on Vehicle Rules:** Automakers need a reform of the rules because they currently have no cost-effective way to meet their emission targets for pickups and light trucks, which are essential to their economic health. Meanwhile, California policymakers are demanding that the targets remain, threatening years of legal uncertainty and a fractured regulatory landscape.

NGVs are the missing piece of the puzzle. The massive environmental benefits of RNG have already been acknowledged by the California Air Resources Board, and the potential of NGVs as a light truck alternative have already been demonstrated by automakers. By reforming regulations to recognize the benefits of NGVs (and harmonize with CAFE incentives in the process), EPA can provide automakers a cost-effective compliance option for light trucks. This would help the environment *and* the economy, through job creation, GDP growth, and trade deficit reduction.

For further info: Robert Atkinson, Chief Reg. Officer, VNG. rcatkinson@vng.co; 908-447-4201

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NGVs, Light Trucks, & the Mid-Term Evaluation

Meeting with Environmental Protection Agency, 12/14/17

Robert Atkinson, VNG Chief Regulatory Officer
RCAtkinson@vng.co, 908-447-4201

Dec-17

VNG and Ariel – Who We Are

- VNG and Ariel are collaborating on this regulatory initiative
- Ariel is the largest manufacturer of reciprocating gas compressors in the world
- VNG builds CNG fueling for light- & medium-duty fleets at existing gasoline stations
  - High-visibility locations that are accessible, convenient, and consumer-friendly, with full service C-store retail amenities; major contrast to heavy-duty CNG private fleet depots, utility yards
  - Locations in Philadelphia, Houston, Dallas, and Milwaukee
  - Discussions with major light-duty fleet for fueling in California (operates ~4,000 NGVs in state)
- VNG has been a leading voice for light-duty NGVs, cited in original 2017-2025 rule

Expanding Compliance Options for Light Trucks

The Problem With Low Gasoline Prices

- As noted in TAR, market shift towards light trucks reduces aggregate emissions benefits of regulations, even if individual OEM targets adjust to compensate
- Battery cost and weight means no EV pickups for foreseeable future – the OEMs' most popular, profitable, and polluting vehicles

NGVs Could Be The Solution – With EPA Support

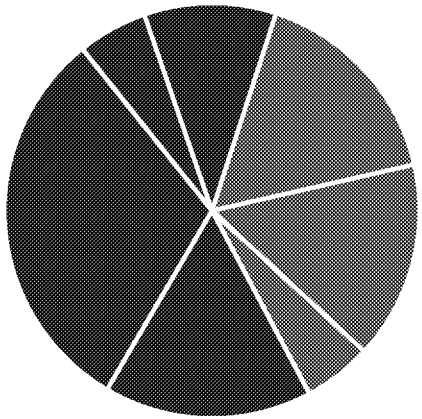
- NGVs have seen dramatic, game-changing reductions in lifecycle emissions since original rulemaking, thanks to major uptake of renewable natural gas (RNG)
- OEMs have already experimented with NGV pickups with limited production of Dodge Ram and Chevy Silverado bi-fuels, CNG-ready Ford F-150

With revised incentives that recognize rapid growth of RNG fueling, NGVs could be a key low-emission compliance pathway for light trucks for 2025 and beyond.

Shift To Light Trucks Eroding Benefits of Rules

YTD 2017 Sales

LIGHT TRUCKS
63% of YTD 2017 auto sales
+4.6% from YTD 2016



CARS
42% of YTD 2017 auto sales
-10.3% from YTD 2016

Source: Wall Street Journal

- Gasoline prices have plunged since rulemaking, shifting market to larger vehicles
- Not a current compliance problem for OEMs, since targets adjust to sales mix
- BUT shift will reduce aggregate emissions benefits of regulations
- Growing OEM concerns about limited compliance options for light trucks - and pickups especially

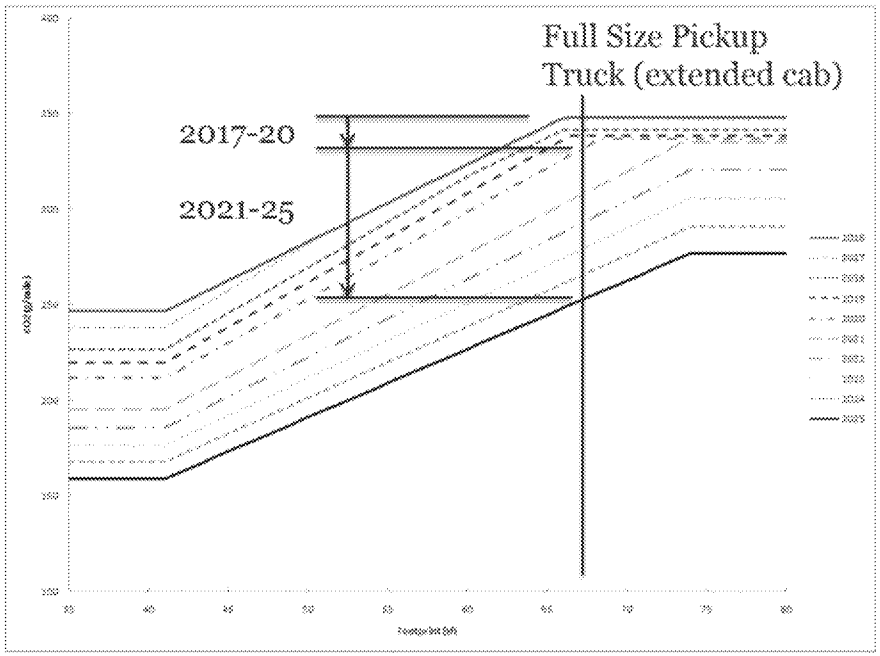
Emission Solutions for Pickups Most Urgently Needed

- Pickups are the top-selling vehicles, most profitable, and most polluting
- Pickups also face the most dramatic increase in CO2 emission requirements in 2021-2025 period – biggest challenge for automakers, few tech options

- No EV alternatives for foreseeable future (2025+) due to weight and utility requirements (2016 TAR)
- Natural gas (or natural gas-ready) versions of Chevy Silverado, Dodge Ram, and Ford F-150 have already been rolled out by OEMs

With support from EPA, NGVs could be best compliance pathway for automakers for light trucks for 2025 and beyond.

Figure I-4 CO2 (g/mile) Light-Truck Standard Curves



Source: Westport

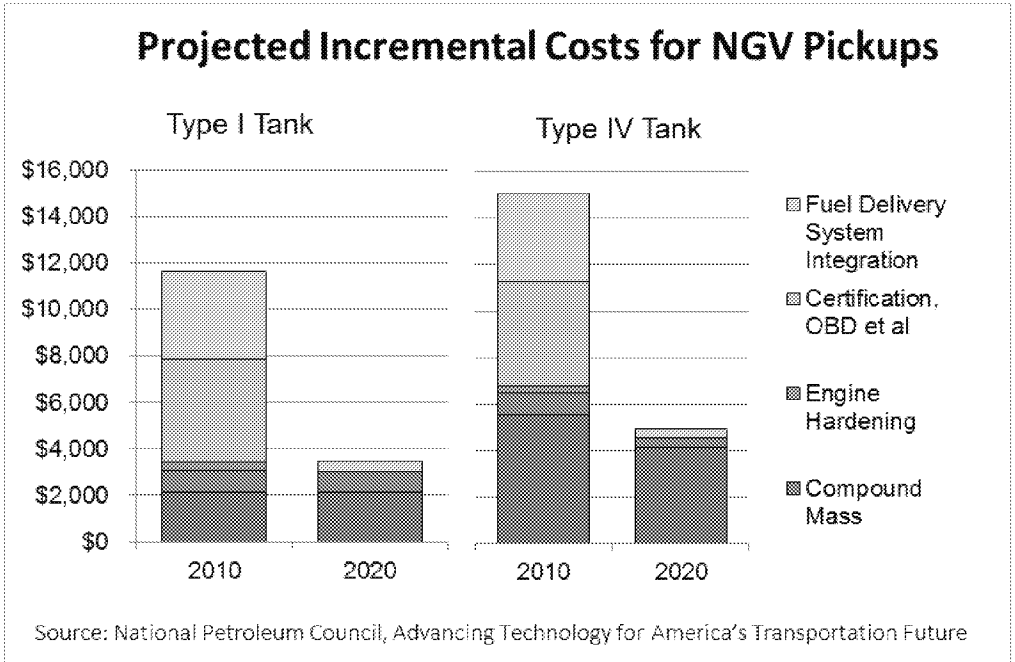
RNG: From 0% to 35% of NGV Fueling Since 2012

- **Original rulemaking:** *"Biomethane will remain a small part of the overall natural gas market for the foreseeable future"…*
- **Today:** Biomethane/RNG accounts for about 35% of national NGV fueling, 60% in California (Fleets & Fuels) – and growing as fast as RNG projects can come online
- **Why?** Regulations - and economics. RNG reclassified as cellulosic biofuel in 2014, RIN revenues of ~$23/MMBTU (UC Davis) make it more profitable than fossil.
  - —3x revenues from transportation vs electricity sales (CARB)
  - —California adds another $11+/MMBTU for LCFS sales (UC Davis)
- **Game-Changing Emissions:** Lowest carbon intensity of any fuel measured under California's Low Carbon Fuel Standard – **pathways up to -304 gCO2e/MJ** (CARB)

Economics of RFS and LCFS will ensure continued growth in RNG use for NGVs, and growth in NGV market will be primary driver of new RNG capture projects.

Major NGV Cost Reductions With Scale

- NGVs have far greater potential for rapid incremental cost reductions than EVs, as costs come from design/regulatory – not components (i.e. batteries)
- Fuel system integration + certification are >50% of NGV incremental costs (NPC)
- Fixed costs virtually eliminated overnight if spread over large number of vehicles
- Precedent in Europe (e.g. Italy), where OEM-produced NGVs retail for <$3,000 more than gasoline model (BCG)
- $3,000 is projected cost to lightweight pickup truck for 10% emissions improvement (TAR)
- NGVs offer comparable cost with much greater emission reduction



Advanced Tech for Ultra-Low NGV Pickup Emissions

- NGVs already commercial tech – but can be pushed much farther by taking advantage of high octane, clean-burning properties of gas
- Westport (Cummins JV partner) has proposed "Super Pickup Truck" NGV concept with >30% greater fuel economy, ultra-low NOx
- Advanced tank technologies (e.g. adsorption) another avenue of improvement
- Hybrid/Plug-In Hybrid pathway offers further potential emission reductions

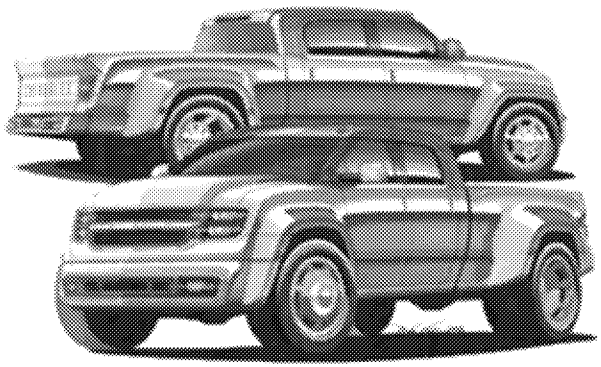
Advanced powertrains that fully exploit ultra high-octane low-carbon fuel properties of methane

a. Not been done to-date – missed opportunity

b. High efficiency and high performance at the same time, outperform gasoline and diesel

c. >30% CO2 reduction TTW

- Westport, "Methane: The Performance Fuel"

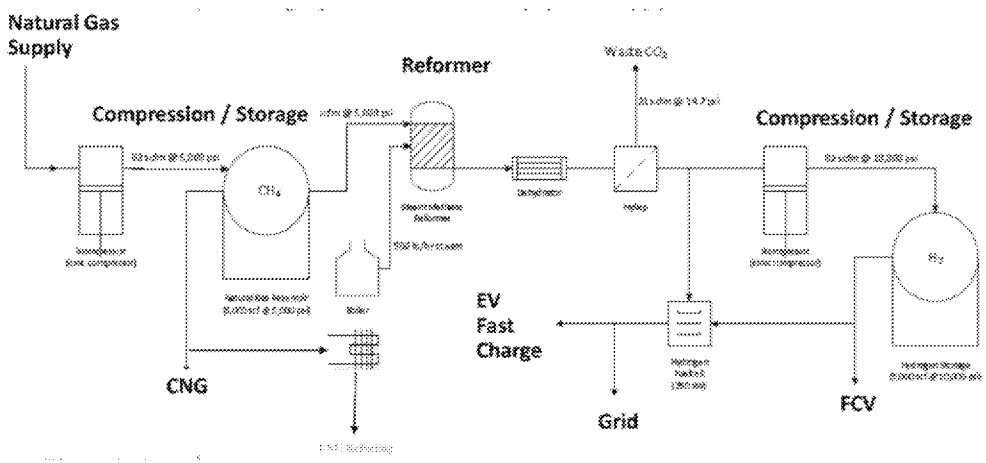


NGV Synergies With Hydrogen

- Vehicle synergy via gaseous fuel storage tech (e.g. adsorption tanks)
- CNG/H2 fueling can be combined, or else CNG stations can be transitioned to H2 at a later date due to shared components
- RNG is also fuel for ultra-low GHG H2 production – NGVs develop market for production infrastructure today for H2 fueling tomorrow

"Planning for the addition of H2 infrastructure at CNG fueling locations can facilitate the adoption of hydrogen at a later date and smooth the transition to near zero carbon technologies."

- **UC Davis STEPS Program**



Proposed Reforms to GHG Rules – 0.15 Divisor

Return to "0.15 divisor": Calculate CNG emissions as 0.15x gasoline emissions, as in the pre-MY 2016 GHG regulations

- Equivalent to 85% reduction, reflects game-changing lifecycle RNG emissions (some pathways achieve 100% or more)
- Analogous to EV 0 g/mi incentive that assumes 100% renewable electricity; instead, assumes 100% RNG use
  - *RNG use of 35% nationally and growing is equal to % of zero-carbon electricity (renewables + nuclear) in national mix*
- Like EV incentive, can be transitioned to real-world lifecycle emissions based on national RNG use (can use RFS data)
- Harmonizes with CAFE Petroleum Equivalency Factor (PEF)

A return to the 0.15 divisor could enable OEMs to achieve existing 2025 targets and establish NGVs as long-term compliance pathway for light trucks.

Proposed Reforms to GHG Rules – Dual-Fuel Design

Remove utility factor design requirements for dual-fuel NGVs: Eliminate need for 2:1 CNG-to-gasoline range ratio, use of gasoline only when CNG tank is empty

- Dual-fuel vehicles critical to building NGV market as fueling develops, like PHEVs
- Fastest, lowest-cost pathway is adding CNG tank to existing gasoline vehicle
- However dual-fuel NGVs face unique design requirements to receive utility factor, despite having much greater CNG range vs PHEV electric-only range
- Forces automakers to add cost (from shrinking and redesigning gasoline tank) and decrease total range and utility (from increased size of CNG tanks) if they want to receive full utility factor incentives
  - **Example:** FCA chose design simplicity over incentives with Dodge Ram dual-fuel, with 255 miles of CNG range and nearly 400 miles of gasoline range

These design requirements are as unnecessary for dual-fuel NGVs as for PHEVs, and will force OEMs to either limit consumer appeal or lose incentives.

Proposed Reforms to GHG Rules – Pickup Incentive

NGV Pickup Incentive: Create full-size pickup incentive equivalent to hybrid incentives for both dedicated and dual-fuel NGVs with **no** minimum penetration

- Cleaner technologies for pickups badly needed, but currently no projected use of existing full-size pickup advanced technology incentives (2016 TAR)
- NGVs are ideal next-gen pickup platform and could qualify for performance-based incentive (<15% emission reduction)…
- But 10% minimum penetration threshold too high for alternative fuel vehicles; too risky for OEMs to make big, immediate move in critical profit segment
- Removing threshold and awarding incentives for every NGV pickup would encourage OEMs to experiment, invest in new technology

NGV-specific incentive would surpass original goals of full-size pickup incentives by providing new platform for continuous, long-term efficiency improvements

Proposed Reforms to GHG Rules – Retrofits

Retrofit Credits: Create credits based on remaining useful life of converted vehicle: for instance, conversion of 5 year-old pickup would get credit for 50% emission reductions as a new vehicle; credits awarded to converter, can be sold to OEMs

- Vehicle life steadily increasing beyond 10 years, likely to continue growing as vehicle prices increase – how to avoid erosion of program benefits?
- NGV retrofits offer pathway to reduce emissions from vehicles significantly during their useful life – very successful in Utah, Oklahoma
- These emission benefits not currently captured in (or incentivized by) rules
- Synergies with EPA reforms to certification rules in 2011
- Could also add off-cycle credits for CNG-ready "prep packages" (e.g. Ford F-150)

Incorporating retrofits is an "outside the box" solution that would accelerate progress and honor EPA mandate to regulate emissions throughout useful life

Action On NGV Light Trucks is Major Opportunity

Incentivizing NGVs as part of GHG rules ensures continued progress on not only emission reductions but on vehicle and fuel technologies:

- Introduces low-emission options for pickups a decade or more in advance of EV technologies in this segment
- Shifts trajectory of potential emissions improvements for light truck segment, allowing more ambitious post-2025 targets
- Pathway to near-zero emissions and beyond with advanced ICE engines, RNG, and hydrogen synergies
- Drives market for RNG capture, realizing massive lifecycle emission reductions and cost-effective waste recovery that compliments broader EPA agenda

Robert Atkinson, VNG Chief Regulatory Officer
RCAtkinson@vng.co, 908-447-4201

VNG

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 1/8/2018 5:01:19 PM
To: Hengst, Benjamin [Hengst.Benjamin@epa.gov]
CC: Lewis, Josh [Lewis.Josh@epa.gov]
Subject: RE: Meeting Request re: Natural Gas Vehicles
Attachments: Updated VNG Comments on EPA-HQ-OAR-2015-0827.pdf; NGV Executive Action Summary.docx

Ok sounds good – thanks Ben.

From: Hengst, Benjamin
Sent: Monday, January 08, 2018 11:59 AM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: RE: Meeting Request re: Natural Gas Vehicles

I think 45 min would be appropriate.

OTAQ invitees would be:
Chris G
Bill Charmley
Ben Hengst
Robin Moran
Jeff Alson
Julia Burch
David Orlin
Mark Kataoka

In talking to Bill, you guys can convey that we don't think that this is a big priority, but that they seem to be heavily engaged with OP political management already, so it makes sense to make sure OAR political management is up to speed, too.

Thanks-Ben

From: Atkinson, Emily
Sent: Monday, January 08, 2018 11:25 AM
To: Hengst, Benjamin <Hengst.Benjamin@epa.gov>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: RE: Meeting Request re: Natural Gas Vehicles

Thanks Ben – we can run this recommendation by Bill and then I can reach out to set this one up. If Bill wants to take this meeting – who from OTAQ would you like included on the scheduler? And would 30 minutes be enough or is 45 minutes more appropriate for this group?

From: Hengst, Benjamin
Sent: Monday, January 08, 2018 10:57 AM
To: Lewis, Josh <Lewis.Josh@epa.gov>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Request re: Natural Gas Vehicles

Josh—I ran the traps on this. OTAQ's recommendation is that Bill Wehrum should take the meeting, but that it should be on a later timeline (e.g., early to mid-February).

Please let me know if you want to discuss more. Thanks--Ben

From: Lewis, Josh
Sent: Friday, January 05, 2018 1:16 PM
To: Hengst, Benjamin <Hengst.Benjamin@epa.gov>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: FW: Meeting Request re: Natural Gas Vehicles

Drew Feely in OP called me about something yesterday and mentioned the meeting below in passing...if I'm recalling correctly he said you were part of the OTAQ mtg that Jamie references. If that's true, wondering if you think a follow up meeting now w/ Bill is appropriate?

From: Tucker, Jamie [mailto:jtucker@AKINGUMP.COM]
Sent: Wednesday, January 03, 2018 3:21 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Cc: Feeley, Drew (Robert) <Feeley.Drew@epa.gov>
Subject: Meeting Request re: Natural Gas Vehicles

Emily/Josh - On behalf of VNG.Co, a natural gas vehicle fueling infrastructure company, we wanted to see if Assistant Administrator Wehrum would be available this month to discuss a number of administrative and legislative policy changes the company is advocating to promote the adoption of natural gas vehicles largely by leveling the playing field with electric vehicles. We have had recent conversations with the Office of Policy as well as the Office of Transportation and Air Quality to discuss these proposals as well as with staff at the White House and Department of Transportation. With Mr. Wehrum's confirmation we would like to fold him into the conversation as well.

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Specifically, we would encourage the Administration to consider:

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requirements exists for hybrid electric vehicles. This is the most important regulatory change as a complement to the 0.15 divisor of the three.

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Enclosed for your further consideration are our Midterm Evaluation comments as well as information outlining the rationale for the recommended regulatory changes.

Thank you for your consideration.

Jamie

Jamie Tucker
AKIN GUMP STRAUSS HAUER & FELD LLP
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Fax: +1 202.887.4288 | jtucker@akingump.com | akingump.com | Bio

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VNG

Natural Gas Vehicles (NGVs):
The Common Sense Solution To Achieving Emissions Reduction Compliance At Low Cost and Low Risk

NGVs ideally suited to help pickups, light duty trucks reach 2025 emissions goals

- Light duty trucks face biggest compliance challenge, are critical to Big Three future
- EVs not an option – batteries too expensive, too heavy for larger vehicles
  - NGVs are proven: Ford F150, Chevy Silverado, Dodge Ram

Correcting NGV incentives is straightforward – and justified

- No consideration of NGV technology in 2016 Technical Assessment Report despite availability of abundant domestic fuel and vehicle technology
  - Game-changing Renewable Natural Gas (RNG) delivers more than 85% lifecycle emission reductions
- Restore pre-2015 "0.15 divisor" to harmonize EPA with statutory CAFE incentives,
  - Parity with EV incentives: just as EV incentives reflect renewable energy, restoring 0.15 divisor for NGVs would reflect emissions benefits of RNG (85%)
  - Would allow OEMs to easily meet 2025 targets for pickups
- Parity: eliminate arbitrary driving range requirement imposed on bi-fuel NGVs
  - Plug-in hybrids have no requirements despite much shorter electric range
- Provide NGV pickups with same emissions credits as "Strong Hybrids"
  - Eliminate minimum penetration for NGV pickup incentives: NGVs as 10% of all pickups not immediately feasible for alt fuel like natural gas

Additional opportunity for smarter regulations: encourage retrofits

- Retrofitting deployed vehicles with natural gas reduces emissions of existing fleet
- Build on NGV retrofit successes in Oklahoma, greatly expand benefits of rules
- Allow converters to receive credits based on vehicle's remaining useful life, sell/transfer to OEMs

Restoring parity between NGVs and EVs, and between EPA and NHTSA, will provide automakers much-needed compliance flexibility for light trucks and pickups – and by making these changes effective immediately, we can start building this industry today.

VNG

Comments by VNG.co LLC on
Reconsideration of the Final Determination of the Mid-Term
Evaluation of Greenhouse Gas Emissions Standards
For Model Year 2022–2025 Light-Duty Vehicles

Docket ID: EPA–HQ–OAR–2015–0827

VNG.co LLC is a developer of compressed natural gas (CNG) fuel dispensing infrastructure for light- and medium-duty natural gas vehicles (NGVs). We welcome this opportunity to comment on the Midterm Evaluation (MTE) of light-duty vehicle greenhouse gas standards established for model years 2022-2025 and provide the agencies[1] with much-needed updated information on NGVs and their ability to contribute to the goals of the regulations.

Indeed, NGVs are perhaps the largest and most consequential knowledge gap in the agencies' work on these regulations to date. The only substantive discussion of NGVs in the 1,217 page Technical Assessment Review (TAR) issued by EPA, NHTSA and CARB was one short paragraph noting the growth in CNG fueling infrastructure,[2] and NGVs were not included in the TAR's models for automaker compliance.[3] This is inexplicable considering that U.S. OEMs (the "Big Three") have each produced pickups that operate on compressed natural gas (CNG) in recent years, as well as the fact that there are 22 million NGVs on the road globally - including many produced by OEMs that also serve the U.S. market.

However, this decision to exclude NGVs from serious analysis becomes even more confounding when one considers the radical changes that have occurred in the emissions profile of this technology since the original rulemaking. Renewable natural gas (RNG) can reduce lifecycle greenhouse emissions by 85% or more compared to gasoline, and this ultra-low carbon biofuel now accounts for over 35% of NGV fueling nationally and over 60% of NGV fueling in California. Furthermore, engine manufacturers are beginning to explore the potential of advanced engine designs to take advantage of CNG's high-octane, inherently low-emission properties - another major opportunity to meet the agencies' goals that has been completely unexplored to date.

The virtual exclusion of NGVs from the analysis and discussion has led to the perception of regulators having a false choice between siding with automakers and consumers on one side and environmentalists on the other. Automakers assert that they cannot stop consumers from buying the larger, less fuel-efficient vehicles they want (and in many cases need), and that meeting the current emissions targets for 2025 would impose major costs and risks on their business. Meanwhile, environmentalists insist that we need to transition our entire vehicle fleet to electric vehicles (including hydrogen fuel cell vehicles) as soon as possible, despite the fact

[1] While these Comments are being submitted in the EPA's docket, it is VNG's expectation that they will be also be considered by the National Highway Traffic Safety Administration (NHTSA) and the California Air Resources Board (CARB), collectively "the agencies."
[2] *Draft Technical Assessment Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025*, ENVIRONMENTAL PROTECTION AGENCY (July 2016), at 9-41, https://nepis.epa.gov/Exe/ZyPDF.cgi/P100OXEO.PDF?Dockey=P100OXEO.PDF (hereinafter "Draft TAR").
[3] *Id.* at 5-502.

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that they are not projected to have more than 1-2% market share through at least 2025 – and are especially unlikely to be a practical choice for SUVs and pickups due to their weight and utility requirements.

NGVs are the missing piece of the puzzle. From an automaker's perspective, they offer a proven pathway to dramatically reducing emissions from their large-footprint vehicles, with similar costs and much greater benefits than lightweighting for pickup trucks. For environmentalists, the use of RNG offers similar or even superior emissions benefits to EVs, while also immediately addressing the segments of the auto market (e.g. light trucks) that are unlikely to have an electric alternative for the foreseeable future.

Reforming the light-duty emission regulations to make NGVs a practical compliance path for automakers thus offers the agencies a way to preserve the stringency of existing targets while simultaneously making it easier for automakers to meet them cost-effectively. Equally important, individual Americans will benefit from the use of a cleaner transportation fuel with lower and more stable pricing, compared to gasoline, all while purchasing the vehicles they want and need at reasonable costs. That's a win-win-win.

The following comments detail the reasons for providing robust regulatory support for NGVs on par with previous regulatory support for EVs, organized into the following sections.

- **The Need for Light Truck Alternatives in a Changing Market Context:** Consumer demand is shifting towards large vehicles with relatively low fuel economy. NGVs are ideally suited to provide a low-emission, non-petroleum alternative for the light truck segment, which is unlikely to be served by electric vehicle (EV) alternatives for the foreseeable future.

- **Renewable Natural Gas - A "Waste-to-Wheels" Emissions Game-Changer:** RNG is a game-changer that puts NGVs on par with an EV powered with wind or solar power - and it accounts for a much higher percentage of NGV fuel use than renewable electricity in the overall electricity mix. The rules must account for this dramatic shift and provide incentives for NGVs similar to those provided for EVs.

- **Potential for Rapid Cost Reductions, Consumer Savings with NGVs:** Unlike EVs, NGVs do not depend on inherently-expensive components like batteries, giving them much greater potential for rapid cost reductions with production at scale. This potential has already been demonstrated by European OEMs and gives NGVs much greater potential for mass-market adoption than the agencies have recognized to date.

- **Importance of Dual-Fuel NGVs:** Dual-fuel (commonly referred to as "bi-fuel") vehicles will play an important role in the market development of NGVs during early years of infrastructure buildout. The agencies took steps towards providing important support for bi-fuel NGVs in the original rulemaking, yet also placed unfair restrictions on this support that were not placed on similarly-important plug-in hybrid electric vehicles.

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- **Advanced NGV Technologies Promise Best Emissions Path for Internal Combustion Engines (ICEs):** The development of new engine technologies optimized for CNG's inherently high-octane, clean-burning qualities gives NGVs unsurpassed potential for environmental performance on a mass-market-ready ICE platform.

- **"Bridge to Hydrogen" Needed More Than Ever:** The agencies have previously recognized the ability of NGVs to provide a "bridge" to hydrogen-fueled vehicles thanks to numerous technology synergies on the vehicle as well as the fueling side. The opportunities for such synergies have expanded in recent years, and are as urgently-needed as ever due to the slow market uptake of hydrogen fuel cell vehicles.

- **Emissions Solution for Mid-Life Vehicles:** Sec. 202(a) of the Clean Air Act requires the agencies to regulate vehicle emissions throughout their useful life, but the current light-duty program only provides incentives for low-emission technologies deployed in *new* vehicles. As states like Oklahoma and Utah have shown, there is significant potential to reduce emissions and petroleum use from older vehicles with CNG retrofits, and these benefits should be recognized and encouraged in these regulations.

- **Addressing the Threat of Petroleum Dependence:** The CAFE program was originally created as a response to the oil crisis of 1973; yet, more than 40 years later, the program has done very little to reduce our near-total dependence on petroleum, and the agencies project that the 2017-2025 rules will not make a meaningful difference either. The current regulations ensure this in part by disadvantaging natural gas, perhaps our best hope for a long-term solution to this problem.

- **NGV Reform Needed Today for 2017-2021 Targets:** Because the current disparity between treatment of NGVs and EVs is so clearly arbitrary and contrary to real-world lifecycle GHG emissions, and because automakers need this compliance flexibility and regulatory certainty in order to confidently invest in NGV production, these changes should be made effective immediately – without waiting for the 2022-2025 period. EPA's review of the 2021 targets as part of this proceeding is an excellent opportunity to do so.

In addition to providing information on each of these topics for use in the rulemaking process, we will indicate the specific topics from EPA's Request for Comment that each section is relevant to, and we will conclude each section with a list of recommended changes to the regulations. By updating the regulations to incentivize the deployment of NGVs similar to the previous administration's focus on incentivizing EVs, the agencies will provide automakers with a greater range of compliance pathways that will help achieve the goals of the regulations sooner and more cost-effectively, to the collective benefit of consumers, the environment and industry.

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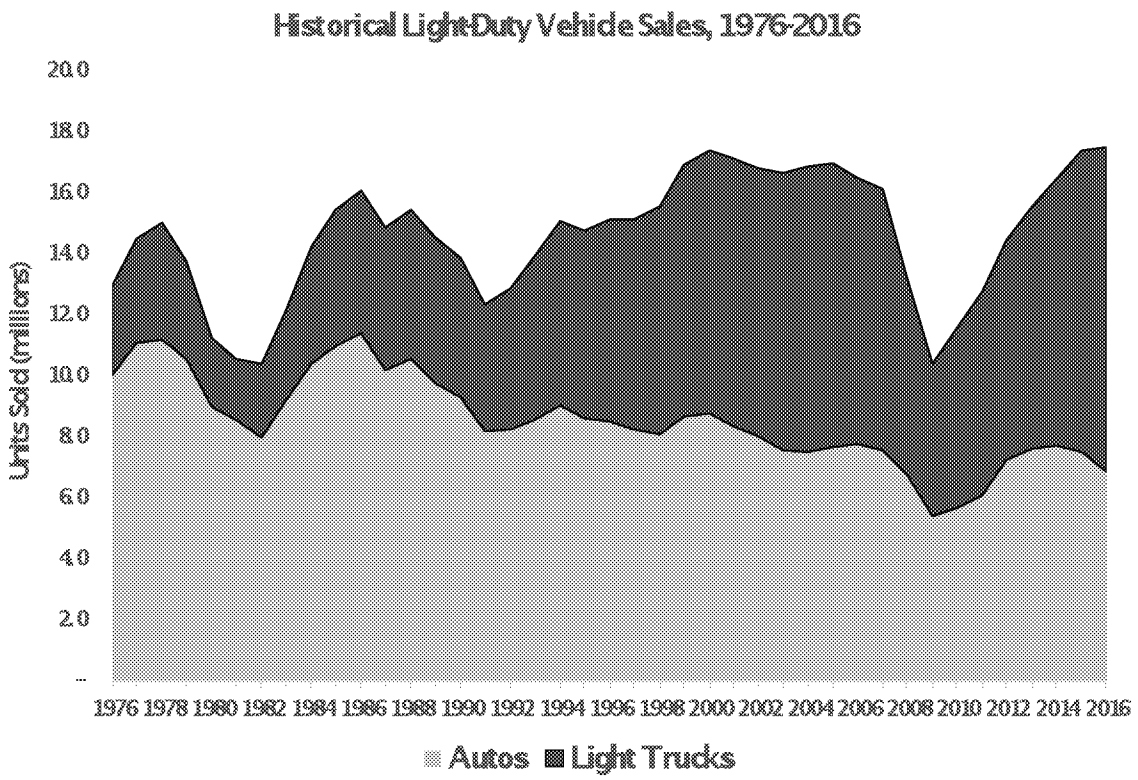
The Need for Light Truck Alternatives in a Changing Market Context

Issues Addressed:

- *The impact of the standards on the automobile industry*
- *The feasibility and practicability of the standards*

As the agencies acknowledged in the 2016 draft Technical Assessment Report (TAR), low gasoline prices have encouraged U.S. consumers to gravitate towards the purchase of larger and less fuel-efficient vehicles. After the Great Recession of 2008 decimated all classes of vehicle sales as well as oil prices, light truck sales have rebounded much more strongly than passenger vehicles and are approaching all-time highs and a market share of over 60%.[4] As the experience of the 1980s-2000s demonstrated, this shift in the market towards light trucks is likely to be sustained if gasoline prices stay low for the long term, as many observers have speculated - including oil majors like Shell, whose CEO recently said that oil prices may be "lower forever."[5]



Source: Bureau of Economic Analysis, 2017[6]

[4] *Auto and Truck Seasonal Adjustment*, BUREAU OF ECONOMIC ANALYSIS (August 2, 2017), https://www.bea.gov/national/xls/gap_hist.xlsx
[5] Sarah Kent, *Shell Prepares for 'Lower Forever' Oil Prices*, WALL ST. J. (July 27, 2017), https://www.wsj.com/articles/royal-dutch-shells-second-quarter-earnings-rise-sharply-1501137915
[6] *Auto and Truck Seasonal Adjustment*, BUREAU OF ECONOMIC ANALYSIS (August 2, 2017), https://www.bea.gov/national/xls/gap_hist.xlsx

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Even if gasoline prices rise again, these large light duty vehicles will always account for a sizable part of the market due to their unique ability to meet specific consumer and business needs. While the footprint-based structure of the rules ensures that automakers will have to increase the fuel economy of all vehicles in order to achieve compliance, the TAR projected that this trend will nonetheless reduce the original projected impacts of the rules on petroleum dependence and greenhouse gas emissions.

The size of light trucks limits the availability of cost-effective solutions to increasing fuel economy and reducing emissions – particularly for full-size pickups, which have added performance requirements. For example, the TAR estimated that the total cost of a 20% mass reduction for towing-capable pickups, which would improve fuel economy and emissions by only 10%, would be roughly $3,000. It is also particularly challenging to electrify light trucks and pickups due to the added cost and weight of the battery packs needed to move these larger vehicles, particularly those built for carrying or towing heavy loads. Indeed, there are very few electric light trucks on the market today and no pickups, and the TAR does not even consider the possibility of electric towing-capable vehicles within the 2025 timeframe.[7]

Pickup trucks are the best-selling vehicles in America, as well as the most important source of profits for the "Big Three" U.S. automakers. Thus, a cost-effective solution to their emissions and petroleum dependence is absolutely essential to ensuring that these companies, their hundreds of thousands of employees, and the millions of consumers and businesses that rely on pickup trucks are not unnecessarily harmed by the agencies' regulations.

Fortunately, and in contrast to electrification, compressed natural gas (CNG) is ideally suited to be a low-emission, non-petroleum alternative fuel for light trucks and pickups especially. Larger vehicle envelopes provide ample room for CNG storage tanks, and since natural gas offers far greater energy density than batteries, it is much better-suited for moving heavy vehicles. These characteristics are why natural gas has long been the clean fuel of choice for heavy-duty vehicles like transit buses and refuse trucks, and the same logic holds true for the heavier side of the light-duty vehicle spectrum.

Indeed, automakers have demonstrated that NGVs are already a viable commercial technology. All three U.S. automakers have offered either CNG-equipped or CNG-ready versions of their flagship full-size pickups, including GM's Chevy Silverado,[8] FCA's Dodge Ram,[9] and Ford's F-

[7] Draft TAR, supra note 2, at 4-40.
[8] Brandon Turkus, *2015 Chevy Silverado HD gets CNG option*, AUTOBLOG (Feb. 6, 2014), http://www.autoblog.com/2014/02/06/2015-chevrolet-silverado-hd-cng-official/.
[9] Richard Truett, *Ram will expand lineup of CNG-powered trucks*, AUTOMOTIVE NEWS (Mar. 4, 2015), http://www.autonews.com/article/20150304/OEM05/150309913/ram-will-expand-lineup-of-cng-powered-trucks.

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150. In fact, in addition to being the best-selling vehicle of any model, the 2016 Ford F-150 was named Green Car Journal's "Green Car of the Year" in part due to the availability of a CNG prep package as an option.[10]

Thus, the rules should encourage automakers to transition these vehicle segments to natural gas in two ways. First, they should be provided strong incentives to do so, including special incentives for pickup trucks similar to the incentive previously created for hybrid-electric pickups. Second, natural gas should be factored into setting targets for what can be reasonably achieved for light trucks and pickups, since this is a mature, proven, commercially-available technology that automakers have already deployed in recent years.

Summary and Recommendations

Because light trucks and pickups especially are a critical market segment for consumers, businesses and automakers, and because neither electrification nor lightweighting are practical alternatives for these heavier vehicles, EPA should provide a clear regulatory pathway for automakers to transition these segments to natural gas.

- Provide emissions credits for all NGVs that reflect the emissions benefits of renewable natural gas (RNG), as discussed in the following section.

- Offer a "Natural Gas Pickup" incentive similar to current hybrid-electric and "performance-based" pickup credits; however, for the natural gas pickup credit, minimum deployment thresholds should be eliminated to reflect the greater market challenges faced by NGVs - since, unlike hybrid-electrics, they use an alternative fuel. Expecting an automaker to immediately transition at least 10% of their critical pickup fleet to an alternative fuel is simply not realistic, and renders the current "performance-based" credit useless despite the fact that natural gas can meet the credit's performance threshold of 20% emission reductions.

    - This goal could be accomplished by inserting a new section (c) under 40 C.F.R. § 86.1870–12, *CO_2 credits for qualifying full-size pickup trucks*, titled "Credits for implementation of natural gas technology." The structure of these credits would be similar to those for sections (a) and (b), but with reduced or eliminated requirements for the "required minimum percent of full size pickup trucks."

[10] *Fuel Efficiency, Alternative Fuels and Sustainability Earn Ford F-150 2016 Green Truck of the Year Award*, FORD MOTOR CO. (Nov. 19, 2015), https://media.ford.com/content/fordmedia/fna/us/en/news/2015/11/19/ford-f-150-earns-2016-green-truck-of-the-year-award.html.

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- Incorporate the use of natural gas when setting targets for practical, achievable emissions improvements for light trucks and full-size pickups.

Renewable Natural Gas - A "Waste-to-Wheels" Emissions Game-Changer

Issues Addressed:

- *The availability and effectiveness of technology, and the appropriate lead time for introduction of technology*
- *Any relevant information in light of newly available information.*
- *The impact of the greenhouse gas emission standards on the Corporate Average Fuel Economy standards and a national harmonized program*

Since the original rulemaking, there has been a dramatic transformation of the lifecycle emissions profile of NGVs due to the rapid adoption of renewable natural gas (RNG) in the transportation sector. Indeed, this is likely the biggest change in the lifecycle emissions of any fuel or vehicle type since the 2011 rulemaking – yet it was completely absent in the draft TAR for reasons that are not clear.

RNG, also known as biogas or biomethane, captures methane produced from a variety of sources including landfills, dairy and livestock operations, and wastewater treatment plants. Once impurities are removed, this methane can be used as a perfect substitute for fossil natural gas, including distribution in the existing natural gas pipeline system and use in NGVs.

Since methane is a powerful greenhouse gas, the use of RNG can achieve massive emission reductions on a CO2-equivalent basis when used as a transportation fuel. While lifecycle emissions can vary significantly depending on the pathway for RNG production, according to the most recent values for the California Low Carbon Fuel Standard (LCFS) it can yield emission cuts of between 70% and *130%*[11] - in other words, NGVs powered by RNG can be carbon-negative, potentially yielding even greater emissions benefits than an electric vehicle powered entirely by solar or wind energy.

[11] Staff Report, CALIFORNIA AIR RESOURCES BOARD, Proposed Re-Adoption of the California Low Carbon Fuel Standard. Dec. 2014. https://www.arb.ca.gov/regact/2015/lcfs2015/lcfs15isor.pdf.

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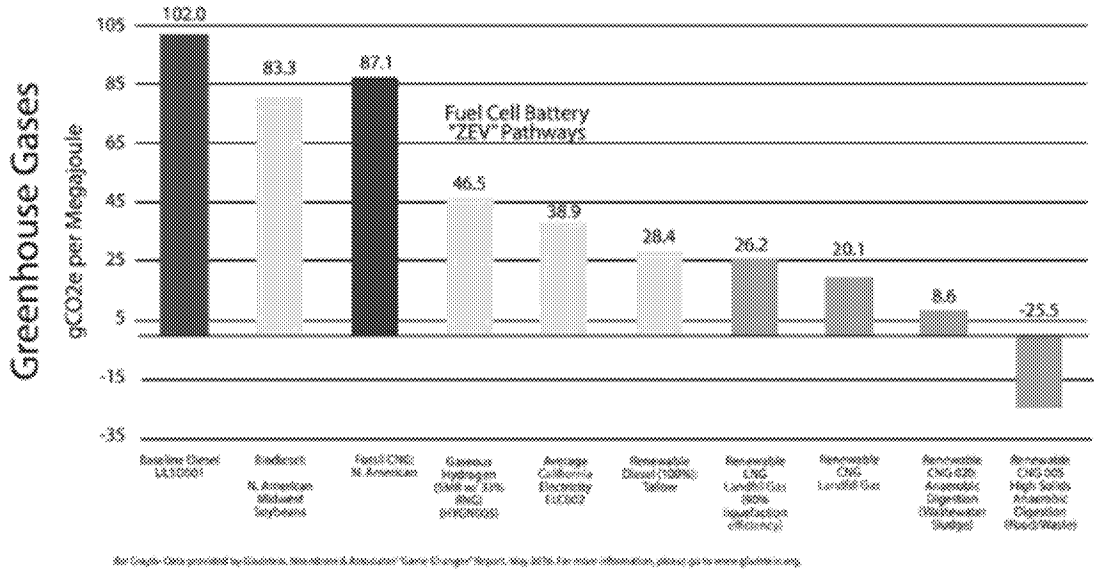


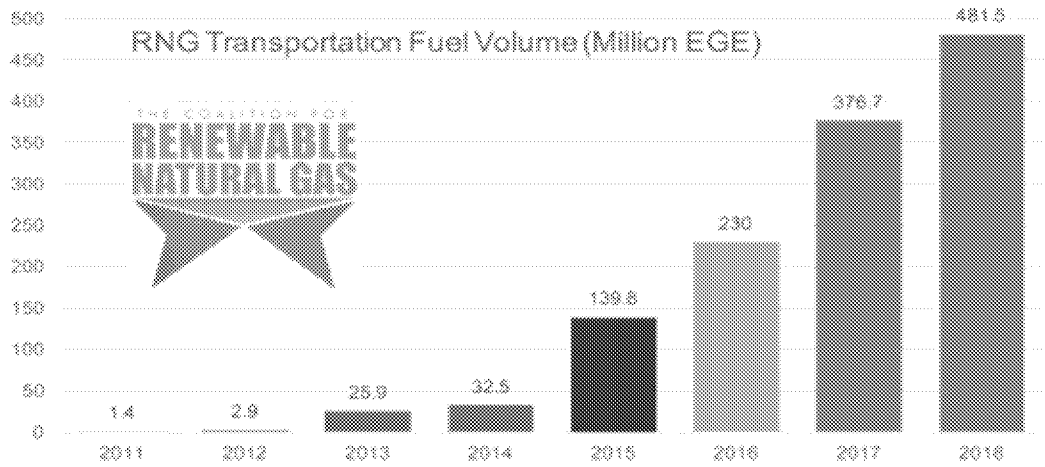
Source: Gladstein, Neandross & Associates[12]

In the original 2017-2025 rulemaking, EPA recognized the potential for RNG to deliver "game-changing" lifecycle GHG emissions for NGVs, but stated that the agency "believe[d] that biomethane will remain a small part of the overall natural gas market for the foreseeable future."[13] This belief is, simply put, outdated. Today, RNG fueling is increasingly the norm for NGVs thanks to the federal Renewable Fuel Standard (RFS) and the California Low Carbon Fuel Standard (LCFS). While these programs were in their infancy during the original rulemaking in 2011, they have since emerged as powerful economic drivers for RNG use in transportation, thanks to the reclassification of RNG as a cellulosic biofuel by EPA[14] as well as CARB's ranking of it as the lowest GHG fuel on the market. [15] Today, the value of these RFS and LCFS credits has made RNG commercially competitive with fossil natural gas.[16]

This economic driver has led to the very rapid increase in the production and sale of RNG fuel to the transportation sector – particularly in California, where fuel retailers can benefit from sales of both LCFS and RFS credits and where there are the largest number of NGVs and natural gas fueling stations. According to the RNG Coalition, over 60% of NGV fueling in California and 35%

[12] *Game-Changer: Next Generation Heavy Duty Natural Gas Engines Fueled By Renewable Natural Gas*, GLADSTEIN, NEANDROSS AND ASSOCIATES (May 2016), http://ngvgamechanger.com/pdfs/GameChanger_FullReport.pdf
[13] 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, 77 Fed. Reg. 62815 (Oct. 15, 2012) (hereinafter "*2012 Light Duty GHG Standards*").
[14] "Renewable Fuel Pathways II Final Rule to Identify Additional Fuel Pathways under Renewable Fuel Standard Program Documents." ENVIRONMENTAL PROTECTION AGENCY. July 18, 2014. https://www.epa.gov/renewable-fuel-standard-program/renewable-fuel-pathways-ii-final-rule-identify-additional-fuel-0
[15] Staff Report, CALIFORNIA AIR RESOURCES BOARD, Proposed Re-Adoption of the California Low Carbon Fuel Standard (Dec. 2014), https://www.arb.ca.gov/regact/2015/lcfs2015/lcfs15isor.pdf
[16] *The Feasibility of Renewable Natural Gas as a Large-Scale, Low Carbon Substitute*, UC DAVIS INSTITUTE OF TRANSPORTATION STUDIES, June 2016. https://www.arb.ca.gov/research/apr/past/13-307.pdf

nationally comes from RNG.[17] In terms of absolute volumes, RNG fuel use in transportation increased fivefold between 2013 and 2015, and the Coalition projects it will more than quadruple between 2015 and 2018.



Source: RNG Coalition, Fleets & Fuels Magazine[18]

With this trajectory of RNG growth, the emissions benefits of NGVs today are already at least as powerful as EVs and likely even greater. Thus, ignoring the growth of RNG is not only outdated, but it renders the regulations ineffective in their stated goal of reducing GHG emissions. It also inhibits job creation not only in the NGV industry but the RNG industry as well, which has the potential to create jobs at farms and municipalities across the country through the capture and sale of locally-produced renewable fuel.

In addition to missing an opportunity to achieve the goals of the regulations, the failure to recognize the emissions benefits of RNG has also resulted in EPA effectively negating Congressional incentives for NGVs under the CAFE program. According to Sec. 6 of the Alternative Motor Fuels Act (AMFA)[19] codified as 49 U.S. Code § 32905, the fuel economy of NGVs and EVs alike is to be calculated using the Petroleum Equivalency Factor (PEF) that treats every gallon-equivalent of compressed natural gas or equivalent electrical energy as 0.15 gallons of gasoline. The goal of this technology-neutral statutory calculation was to provide automakers with a strong incentive to manufacture ***both*** types of alternative fuel vehicles to achieve the goal of American energy independence. By encouraging the production of vehicles that reduce the use of higher-carbon petroleum fuels, the statute also reduces emissions.

While the statute requires that NGVs and EVs be treated the same in terms of measuring fuel economy, there is no equivalent law governing measurement of GHGs. EPA chose to follow

[17] Patrick Couch, *RNG in California: More Than You Think*, FLEETS AND FUELS (Apr. 20, 2016), http://www.fleetsandfuels.com/fuels/cng/2016/04/rng-in-california-more-than-you-think/.
[18] *Id.*
[19] Alternative Motor Fuels Act of 1988, Public Law 100-494, 102 Stat. 2441.

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Congressional CAFE incentives through model year (MY) 2015[20] but thereafter to give NGVs credit for only their tailpipe emissions reductions of approximately 20% compared to gasoline instead of the "0.15 divisor,"[21] while temporarily treating EVs as having *zero* emissions.[22] In its original 2017-2025 rulemaking, EPA acknowledged that this calculation for EVs failed to account for the upstream emissions produced by EVs from power generation but claimed that the long-term potential of EVs to produce "game-changing" emissions when charged with renewable electricity justified this unprecedented incentive.[23]

By contrast, in the same rulemaking EPA recognized the potential for RNG to deliver "game-changing" lifecycle GHG emissions for NGVs, but stated that the agency "believe[d] that biomethane will remain a small part of the overall natural gas market for the foreseeable future."[24] As discussed above, this expectation has been proven wrong for natural gas transportation. To be consistent with this new reality and the goals of the regulation, as well as with the goal of harmonizing EPA's regulations with the statutory CAFE program, the rules should give *both* fuels incentives that reflect their "game-changing" emissions potential: for NGVs, this means credits that are equivalent to 100% RNG fueling, in the same way that the 0 g/mi incentive for EVs is equivalent to the use of 100% renewable electricity.

It would be justifiable to calculate the emissions of a 100% RNG-fueled NGV as 85% below that of a gasoline vehicle - which would be in line with the average cited in the NPC's topic paper on the subject[25] as well as a return to the "0.15 divisor" in line with CAFE's PEF calculation. And, because the present bias towards EV incentives represents the most egregious inconsistency of EPA's regulations with the CAFE program, we believe it is also justifiable to make this change effective immediately, instead of waiting for 2022.

Summary and Recommendations

RNG has transformed the emissions of NGVs since the original rulemaking, accounting for 35% of NGV fueling nationally and delivering emission reductions of 70% to 130%. Because of this game-changing emissions potential, and because existing EPA incentives for alternative fuels are biased towards EVs and disruptive of Congressionally-mandated CAFE incentives for NGVs, the emission calculation for NGVs should be reformed effective immediately.

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[20] Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards, 75 Fed. Reg. 25716 (May 7, 2010)
[21] *2012 Light Duty GHG Standards* at 62623, 62816.
[22] *Id.* at 62819.
[23] *Id. at* 62820.
[24] *Id.* at 62815.
[25] Report, NATIONAL PETROLEUM COUNCIL, *Advancing Technology for America's Transportation* (2012), http://www.npc.org/reports/trans.html.

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- NGV emissions calculations should return to the "0.15" divisor used before 2016, with emissions calculated as 85% below a gasoline vehicle. This is both justified by the real-world emissions benefits of RNG and is consistent with the CAFE program.

    - We recommend reinstating language from the MY 2011-2016 regulations under 40 C.F.R. § 600.510–12, *Calculation of average fuel economy and average carbon-related exhaust emissions*: "For natural gas-fueled model types . . . the carbon-related exhaust emissions value calculated for that model type in accordance with paragraph (b)(2) of this section multiplied by 0.15 and rounded to the nearest gram per mile, except that manufacturers complying with the fleet averaging option for N_2O and CH_4 as allowed under § 86.1818 of this chapter must perform this calculation such that N_2O and CH_4 values are not multiplied by 0.15.[26]"

- This change should be effective retroactively to model year 2017, given the major impediment to NGV adoption posed by the current incentive structure as well as the uniquely egregious regulatory overreach it represents compared to the CAFE program.

- To mirror EV incentives, EPA could consider a similar volume-based transition after 2022 to a regime that considers the real-world use of RNG just as EV incentives will ultimately be calculated based on real-world lifecycle emissions; this would be relatively simple to do since EPA already tracks RNG use under the RFS program.

Potential For Rapid Cost Reductions, Consumer Savings with NGVs

Issues Addressed:
- *The cost on the producers or purchasers of new motor vehicles*
- *The feasibility and practicability of the standards*

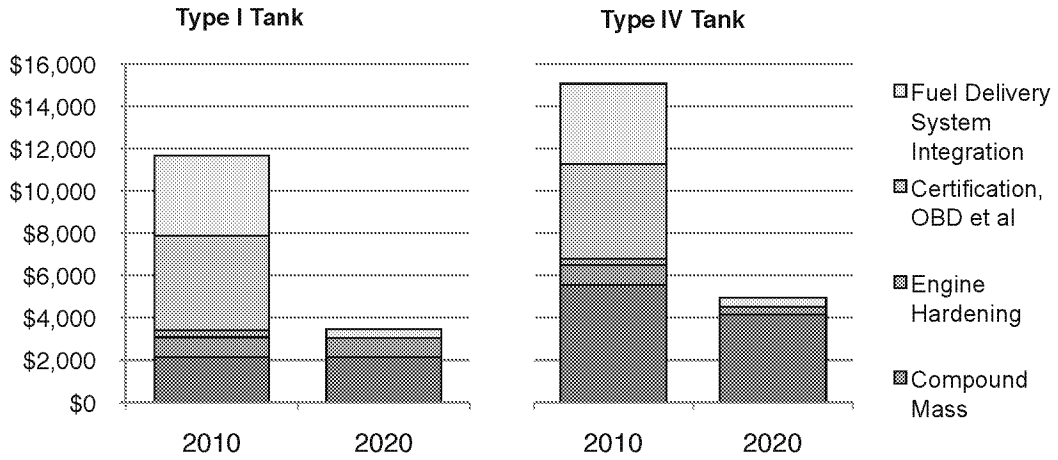
As part of a shift towards a serious analysis of NGVs in the MTE, the agencies must consider not only the current costs of NGVs but their potential for very rapid cost reductions with production at scale. Indeed, while the current incremental prices of CNG pickups are typically $10,000 or more (including upfitting costs), these high costs are primarily due to the need to spread significant up-front design and certification costs over a small number of vehicle sales.

The 2012 report "Advancing Technologies for America's Transportation Future" by the National Petroleum Council (NPC) estimates that about two thirds of the incremental cost of a NGV pickup comes from these areas, and that incremental costs could be reduced to $3,500 per vehicle by 2020 simply by moving to high-volume production (over 100,000 vehicles per year).[27]

[26] 40 C.F.R. § 600.510–12(j)(2)(iii)(A).
[27] Report, NATIONAL PETROLEUM COUNCIL, *Advancing Technology for America's Transportation* (2012), http://www.npc.org/reports/trans.html.

These projections are based in part on experiences in major NGV markets in Europe like Italy and Germany, where volume production has driven incremental costs down to $3,000 or less.[28]

Projected NGV Pickup Incremental Costs, National Petroleum Council



This compares very favorably to the current and projected incremental costs of electric and plug-in electric vehicles. Unlike NGVs, which use the same internal combustion engine platforms as gasoline vehicles and mostly only require the addition of a compressed gas tank made of steel or composites, EVs use batteries that require numerous expensive components and can only reduce costs relatively slowly. This is a critical difference for the agencies to incorporate into their planning, given much greater potential for near-term mass-market adoption of NGVs.

The mass-market potential of NGVs is due to the combination of (potentially) low incremental costs along with the lower and more stable price of natural gas compared to petroleum fuels, which allows the incremental cost to be recouped relatively quickly. According to modeling done in conjunction with the NPC study, this combination gave NGVs the potential to achieve a 17 percent light-duty vehicle market share by 2020 - more than twice the combined market share of electric and plug-in electric vehicles given their projected cost improvements.[29] While this 2012 forecast is clearly unrealistic from the perspective of 2017, the impressive potential for mass-market adoption of a cleaner fuel - and *much* cleaner when RNG is used instead of fossil natural gas - remains an opportunity that should be seriously considered in the agencies' analysis and target-setting.

Indeed, putting aside the comparison to EVs, the potential incremental costs for NGV pickups are comparable to the projected costs for 20% mass reduction via lightweighting cited earlier - $3,000 per pickup. However, as previously stated, lightweighting is forecasted to yield a fuel economy and emissions improvement of only 10%. NGV pickups at scale would have a similar

[28] Rohan Nath et al., *A Realistic View of CNG Vehicles in the US*, BCG PERSPECTIVES (June 16, 2014), https://www.bcgperspectives.com/content/articles/energy_environment_automotive_realistic_view_cng_vehicles_us/.
[29] *Id.*

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incremental cost, yet deliver *twice* the emission reductions with fossil natural gas and many times that with RNG. NGV pickups also completely eliminate petroleum dependence, protecting this critical market segment (and all the consumers, businesses, and workers that depend on it) from oil price swings.

Thus, natural gas deserves to be included in the formulation of the targets for pickups and other light trucks just like other fuel efficiency technologies that have been proven to be cost-effective at scale. This would significantly increase the achievable fuel economy and emissions improvements for these segments within the timeframe of the rulemaking and thus provides a strong rationale for potentially maintaining the existing targets. [30]

Summary and Recommendations

Because NGVs have been proven to deliver rapid and deep cost reductions with high-volume production, the agencies should incorporate them as such into their analysis.

- Modeling used to set achievable emissions curves for pickups and light trucks should include natural gas as a proven technology at costs based on high-volume adoption, not their current incremental costs at low production volumes.

Importance of Dual-Fuel NGVs

Issues Addressed:
- *The impact of the standards on the automobile industry*
- *The feasibility and practicability of the standards*

Dual-fuel NGVs (referred to in the industry as "bi-fuel" NGVs) that operate primarily on CNG but can also operate on gasoline as a backup fuel are likely to play a critical role in winning market adoption of NGVs more broadly. The ability to fuel on gasoline as a backup fuel effectively eliminates consumers' "range anxiety" while CNG fueling infrastructure is not yet as widely available as gasoline, in the same way that dual-fuel electric vehicles (referred to in the industry as plug-in hybrid electric vehicles, or PHEVs) like GM's Chevy Volt have played an important role in expanding the early market for EVs.

The 2017-2025 rulemaking made a major stride towards recognizing the potential benefits of dual-fuel NGVs, which had previously only been assumed to fuel on CNG for 50% of the time. EPA recognized that drivers purchasing dual-fuel NGVs as well as PHEVs are likely to live in areas where fueling (or charging, respectively) infrastructure is reasonably available, and will also preferentially use these alternative fuels whenever possible given their lower cost

[30] Starting the NPC's eight-year projection in 2017 instead of 2012 would imply that an NGV market share of 17 percent could be achieved by 2025 with huge reductions of emissions and petroleum consumption.

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compared to gasoline. Thus, the rules allowed automakers to calculate the fuel usage of both dual-fuel NGVs and PHEVs using a method called the "utility factor" which bases relative consumption of alternative fuels versus gasoline on the vehicle's range on the alternative fuel.[31]

Using this method, a dual-fuel NGV with 250 miles of CNG range – such as the 2015 Dodge Ram[32] – would be assumed to operate on CNG 97.1% of the time, making them nearly as beneficial as a dedicated NGV. PHEVs would receive a similar calculation, although their much shorter all-electric range makes the incentive relatively less beneficial. For example, in the original rulemaking EPA estimated that the Chevy Volt would receive a utility factor of 69% for an all-electric range of 50 miles. [33]

However, despite the fact that utility factors for dual-fuels are ostensibly to be calculated based on their range on alternative fuels, EPA has saddled dual-fuel NGVs with a unique and onerous additional requirement: they must have a CNG range at least double that of their gasoline range in order to qualify for the utility factor calculation, or else they default to an assumed baseline 50% CNG fuel use.[34] Not only that, to be eligible for the incentive, the dual-fuel NGVs must be designed to only use gasoline when the CNG tank is empty.

This requirement is inconsistent with the EPA's assumption that dual-fuel vehicles will fuel as often as possible on CNG for economic reasons, which would imply that their proportion of CNG use should be solely determined by their CNG range according to the utility factors – and not by their gasoline range. Adding further inconsistency, PHEVs face no such requirements, despite the fact of their much more limited all-electric range.

In addition to rendering incentives for dual-fuel NGVs less effective, this requirement adds marketing challenges and, significantly, unnecessary costs to automakers and consumers. To date, the configurations offered by automakers have focused on vehicles that maintain full range on gasoline in order to provide as long of a combined range as possible as well as flexibility; for instance, the dual-fuel GM Silverado has a combined CNG and gasoline range of 650 miles (with the majority coming from gasoline) and allows drivers to switch fuels by flipping a switch.[35]

Beyond unnecessarily restricting customer appeal, the CNG-to-gasoline driving range requirement would require automakers to reduce the size and capacity of the existing gasoline fueling systems in dual-fuel NGVs, which will impose additional costs on manufacturers that will

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[31] *2012 Light Duty GHG Standards* at 62829.
[32] Richard Truett, *Ram will expand lineup of CNG-powered trucks*, AUTOMOTIVE NEWS (Mar. 4, 2015), http://www.autonews.com/article/20150304/OEM05/150309913/ram-will-expand-lineup-of-cng-powered-trucks.
[33] *2012 Light Duty GHG Standards* at 62828.
[34] *Id.* at 62829.
[35] Brandon Turkus, *2015 Chevy Silverado HD gets CNG option*, AUTOBLOG (Feb. 6, 2014), http://www.autoblog.com/2014/02/06/2015-chevrolet-silverado-hd-cng-official/.

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have to be passed on to consumers. Today's dual-fuel pickup truck designs leave the existing gasoline fueling systems intact and simply add CNG storage capacity by placing the CNG tank in the bed of the pickup truck. Downsizing the gasoline fueling system would require additional design, manufacturing, and certification costs that would serve no purpose other than meeting an arbitrary and unnecessary regulatory requirement.

Of course, automakers could also pursue an alternative pathway and maintain the existing gasoline tank size and instead greatly increase CNG fueling capacity. However, this would require tripling or quadrupling the number of CNG tanks currently installed in vehicles like the dual-fuel Dodge Ram, which would add so much weight and take up so much space in the pickup bed that it would be completely unusable for the work fleets that depend on these vehicles. Once again, the current requirement forces automakers to make changes that would increase costs and reduce market acceptance in order to receive full regulatory benefits.

Allowing all NGVs to receive the full utility factor credit for CNG use would remove an unnecessary, ineffective, and arbitrary regulatory impediment to the development of this crucial market segment for stimulating growth in the wider NGV industry.

Summary and Recommendations

Because dual-fuel NGVs are critical for market development and consumer acceptance, and because the agencies should strive to be consistently technology-neutral in their incentives, the unique requirements for dual-fuel NGVs to receive credits based on utility factor calculations should be eliminated.

- Remove the utility factor requirements for a 2:1 ratio of CNG-to-gasoline range, as well as the requirement for dual-fuel NGVs to only use gasoline when the CNG tank is empty.
    - This goal could be achieved by deleting the requirements contained in 40 C.F.R. § 600.510–12, *Calculation of average fuel economy and average carbon-related exhaust emissions*, part (c)(2)(vii)(B) for fuel economy and (j)(2)(vii)(B) for emissions.

Advanced NGV Technologies Promise Best Emissions Path For ICEs

Issues Addressed:

- *The impact of the standards on advanced fuels technology, including but not limited to the potential for high-octane blends*
- *The impact of the standards on compliance with other air quality standards;*
- *The availability of realistic technological concepts for improving efficiency in automobiles that consumers demand, as well as any indirect impacts on emissions;*

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Going beyond today's NGV technology, the agencies should consider the enormous untapped potential of natural gas to deliver even greater environmental and fuel economy benefits in the future. As the highest-octane, cleanest hydrocarbon fuel, natural gas has very favorable physical properties for unsurpassed performance from an internal combustion engine – if automakers are sufficiently incentivized to invest in developing this fuel to its full potential.

Natural gas has 130 octane, far beyond what gasoline – even ethanol-blended gasoline – can provide. In the "Advancing Technologies for America's Transportation Future" study, the NPC projected that this could yield fuel economy up to double that of conventional vehicles when combined with direct injection technologies that fully utilize the properties of CNG.[36] The leading CNG conversion company Westport Innovations is already investigating the potential for natural gas-fueled advanced powertrains that exploit these properties for pickup trucks, with a turbocharged direct injection platform that could reduce carbon emissions by at least 30%.[37]

The potential environmental benefits of CNG aren't limited to greenhouse gases. In 2015, Cummins Westport International (CWI) introduced a heavy-duty CNG engine that was the first engine of any kind to meet the California Air Resources Board (CARB) optional low-NOx emission standard of 0.02 g/bhp-hr NOx – 90% below the 2010 EPA certification level.[38] Owing to the inherently cleaner chemistry of natural gas compared to petroleum-based fuels, similar improvements in performance for NOx emissions could likely be achieved for light-duty vehicles given sufficient automaker interest and investment. While NOx emissions are much lower for gasoline-fueled vehicles compared to diesel vehicles, they are still significant, making this a major untapped opportunity to address smog-forming emissions on our roads.

Agency staff should study the potential of advanced technology to further improve the emissions profile of NGVs, in the same in-depth manner that it has investigated the current and future state of EV and FCV technology. Furthermore, it should incorporate this potential in its assessment of the "game-changing" potential of NGVs as justification for strong incentives.

Summary and Recommendations

[36] Report, NATIONAL PETROLEUM COUNCIL, *Advancing Technology for America's Transportation* (2012), http://www.npc.org/reports/trans.html.
[37] *Methane: The Performance Fuel*, WESTPORT INNOVATIONS (October 2015) https://cleancities.energy.gov/files/u/news_events/document/document_url/128/Brad_Douville__Westport_NGVTF_.pdf
[38] *Game-Changer: Next Generation Heavy Duty Natural Gas Engines Fueled By Renewable Natural Gas*, GLADSTEIN, NEANDROSS AND ASSOCIATES (May 2016), http://ngvgamechanger.com/pdfs/GameChanger_FullReport.pdf

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Because of the high-octane, low-emission properties of natural gas, the agencies should fully study the ability of advanced NGV technologies to further reduce CO2 and smog-forming pollutants and incorporate the results into regulatory incentives and long-term target setting.

- The ability of NGVs to deliver unsurpassed fuel economy for an ICE vehicle should be used as a further rationale for returning to the use of the "0.15 divisor" for calculating NGV emissions, as discussed in the above section on RNG.

"Bridge to Hydrogen" Needed More Than Ever

Issues Addressed:
- *The availability and effectiveness of technology, and the appropriate lead time for introduction of technology*
- *Any relevant information in light of newly available information.*

In awarding advanced technology multiplier incentives to NGVs, the original light-duty vehicle rulemaking in 2012 recognized that there are numerous technical synergies between the development and commercialization of NGVs and hydrogen fuel cell electric vehicles (FCVs) owing to the physical similarities between methane and hydrogen. The agencies wrote that "CNG investments have the potential to facilitate the introduction of hydrogen FCVs in several respects," including innovations in advanced storage materials and tube trailer designs, improved designs for compressors and fuel dispensers, and on-site production of hydrogen from natural gas feedstock. VNG helped to lay out this rationale in a white paper, "NGVs: An Essential Bridge to Hydrogen," commissioned from the consultancy Energy Futures.[39]

Since 2012, the FCV industry has taken its first steps towards commercialization, with Toyota, Honda, and Hyundai each offering models for the U.S. market. The TAR was cautiously optimistic about the uptake of these technologies, with an estimated 125,000 FCVs deployed in California by 2025 thanks to the Zero Emissions Vehicle (ZEV) mandate. However, this does not mean they are fully commercial technologies; indeed, it means that the need for NGV synergies to accelerate the development of this market has been elevated from the realm of the theoretical to the practical. The need is particularly urgent in the area of hydrogen fueling infrastructure, as the TAR estimated that hydrogen fuel demand could begin to outpace infrastructure availability as early as 2019 and as late as 2026.

As noted in the original rulemaking, some of the strongest synergies between these fuels are in the area of infrastructure development. Both CNG and hydrogen fueling stations require the same types of equipment, including compressors, high-pressure storage tanks, and gaseous fuel dispensers. Shared standards, equipment designs, production and operational economies

[39] *Natural Gas: An Essential Bridge to Hydrogen Fuel Cell Vehicles,* ENERGY FUTURES (2011) http://vng.co/wp-content/uploads/2012/05/Natural-Gas-An-Essential-Bridge-To-Hydrogen-Fuel-Cell-Vehicles.pdf

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of scale, and technology innovations in this area could simultaneously drive down costs for both fuels. The September 2014 report "Transitioning the Transportation Sector: Exploring the Intersection of Hydrogen Fuel Cell and Natural Gas Vehicles" by the Sandia National Laboratory[40] goes further, with a concept design for a combined hydrogen and natural gas fueling station that "could improve operational expenditures and also take advantage of common supply chains."

The TAR also noted that "implementation of renewable hydrogen sourcing has posed a financial challenge" for stations developed to date, despite a minimum renewable content of 33% to receive grants from the California Energy Commission and greater incentives for 100% renewable hydrogen stations. RNG is an ideal feedstock for renewable hydrogen production via steam methane reforming (SMR) technology, but the market for FCVs is currently too small to drive widespread development of these resources. As discussed earlier in these comments, increasing the deployment of RNG-fueled NGVs is key to building the market and growing demand for this ultra-low GHG fuel in the near term, ensuring sufficient supplies of RNG for renewable hydrogen production in the longer term.

Finally, these synergies may also yield benefits in the opposite direction, with advances in hydrogen improving the emissions profile of NGVs. The TAR recognizes the potential benefits of power-to-gas applications, in which large-scale wind and solar generation can be used to create hydrogen for blending into natural gas pipelines. While it is discussed in the context of reducing the lifecycle emissions of hydrogen production, this is also clearly relevant to reducing the lifecycle emissions of CNG. The 2013 report "Blending Hydrogen into Natural Gas Pipeline Networks" by the National Renewable Energy Laboratory[41] estimates that natural gas pipelines could accommodate blends of 5-20% hydrogen content with no technical changes by end users (e.g. NGVs), which would not only reduce the overall carbon content of natural gas but also reduce methane leakage from the pipeline system (since hydrogen, as a lighter molecule, would escape from leaks first and 'crowd out' methane).

The NREL report notes that "conceivably, a credit trading system could apply to natural gas with a specified blend content of renewable hydrogen, paralleling the renewable energy credit system used in the electricity sector." In fact, such programs already exist in the transportation sector: the LCFS and RFS programs both allow for the addition of new low-carbon and renewable fuel pathways, and renewable hydrogen-enriched natural gas sold as fuel for NGVs could readily fit within these schema. As with RNG, NGVs can play a crucial role in building this

[40] *Transitioning the Transportation Sector: Exploring the Intersection of Hydrogen Fuel Cell and Natural Gas Vehicles*, SANDIA NATIONAL LABORATORY (2014), https://energy.gov/sites/prod/files/2015/02/f19/2015-01_H2NG-Report-FINAL.pdf

[41] *Blending Hydrogen into Natural Gas Pipeline Networks: A Review of Key Issues*, NATIONAL RENEWABLE ENERGY LABORATORY (2013), http://www1.eere.energy.gov/hydrogenandfuelcells/pdfs/blending_h2_nat_gas_pipeline.pdf

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market in the near term to ensure the availability of renewable, low-emission feedstocks for hydrogen fuel production in the long term.

In all these ways, NGVs could provide much-needed boosts to the development of the FCV industry. On the commercialization side, NGVs will help stimulate adoption of FCVs through lower costs and expanded infrastructure availability, and on the environmental side the expansion of availability of renewable gas feedstocks will maximize the climate benefits of these vehicles. Indeed, NGVs and FCVs should be considered part of the same gaseous fuel pathway and recognized as such in regulations that fully account for and promote the lifecycle benefits of ultra-low GHG gaseous fuel blends.

Summary and Recommendations

The widespread adoption of RNG fueling for NGVs has only increased the synergies between NGVs and FCVs. As such, the agencies should continue to recognize the linkage between these fuels as part of an advanced gaseous fuel pathway for game-changing, long-term emission reductions.

- The mutually-reinforcing ability of both NGVs and FCVs to deliver "game-changing" emission reductions should be used as a further rationale for returning to the use of the "0.15 divisor" for calculating NGV emissions, as discussed in the above section on RNG.

Emissions Solution for Mid-Life Vehicles

Issues Addressed:
- *The impact of the standards on consumer behavior, including but not limited to consumer purchasing behavior and consumer automobile usage behavior.*

Sec. 202(a) of the Clean Air Act requires the agencies to regulate vehicle emissions throughout their useful life, but the current light-duty program only provides incentives for low-emission technologies deployed in *new* vehicles. This is becoming an issue because the past decade has seen a slow, steady increase in the average life of vehicles on our roads, and particularly for light trucks. According to data from the Bureau of Transportation Statistics, the average life of cars on US roads has increased from 9.5 years in 2005 to 11.5 years in 2015[42] - surpassing the 10 year vehicle life currently considered by the agencies.

This trend will likely continue and accelerate if regulations drive up the cost of new vehicles by thousands of dollars, as the agencies themselves have estimated. This will encourage drivers to hold onto their older, less fuel-efficient, and more polluting cars and light trucks for longer and longer, undermining the benefits of the regulations.

[42] *Transportation Energy Databook 2016*, OAK RIDGE NATIONAL LABORATORY, http://cta.ornl.gov/data/index.shtml

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With conventional gasoline cars and trucks, it is essentially impossible to improve the fuel economy and emissions of a given vehicle after it rolls off the assembly line. However, retrofitting existing vehicles to fuel on natural gas has long been a major part of the NGV industry, particularly in states like Oklahoma[43] and Utah[44] that have actively sought to promote the retrofit market. The robust retrofit ecosystem in place for NGVs is fully capable of addressing this market, and the updated certification requirements for remarketed and used vehicles established by EPA in 2012[45] could make this a very cost-effective way to deliver real emissions and petroleum consumption benefits.

While expanding the rules to include emission and petroleum reductions from vehicles that have already been sold is novel, the environmental and energy security benefits that would result are just as meaningful as those stemming from sales of cleaner, more efficient new vehicles.

One way to incentivize retrofits of existing vehicles would be to allow EPA-certified conversion companies to "opt in" to the regulation for the purpose of generating credits for every vehicle they retrofit to operate on natural gas. These credits would be pro-rated based on the vehicle's projected remaining useful life - for instance, a vehicle that is five years old (halfway through the current 10 year/100,000 mile definition of useful life used by the agencies) would receive credits equal to 50% of the emissions benefits of a new NGV, including the "0.15 divisor" and the full-size pickup bonuses proposed in previous sections. The conversion company could then sell the credits to automakers looking to reduce their compliance costs in a given vehicle category.

Incentives for the development of the aftermarket upfit and retrofit ecosystem could also be incorporated into regulations for new vehicles, by including credits for CNG "prep packages" in the off-cycle credit program. For instance, the previously-mentioned 2016 Ford F-150 pickup has a CNG "prep package" including hardened valves, valve seats, pistons and piston rings, which significantly reduces the future cost of upfitting/retrofitting the vehicle for CNG operation.[46] Since this feature increases the likelihood that vehicles will be converted to a low-emission, non-petroleum fuel, it should be included on the off-cycle credit menu.

We encourage the agencies to consider these and other creative solutions to incorporate retrofits and aftermarket upfits into the rules. Doing so would help to counter the environmental and petroleum consumption impacts of increasing vehicle life, encourage closer collaboration between automakers and conversion companies, and improve the rules' cost-effectiveness.

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[43] Jay F. Marks, *CNG vehicle conversion business is booming for Oklahoma company*, THE OKLAHOMAN (Mar. 16, 2012), http://newsok.com/article/3658028.
[44] Clifford Krauss, *Surge in Natural Gas Has Utah Driving Cheaply*, N.Y. TIMES (Aug. 29, 2008), http://www.nytimes.com/2008/08/30/business/30gascars.html.
[45] *Certification and Compliance for Vehicles and Engines*, ENVIRONMENTAL PROTECTION AGENCY, https://www3.epa.gov/otaq/consumer/fuels/altfuels/altfuels.htm.
[46] *First Compressed Natural Gas and Propane-Capable 2016 Ford F-150 Rolls Off The Line At Kansas City*, FORD MOTOR CO. (Dec. 9, 2015), https://media.ford.com/content/fordmedia/fna/us/en/news/2015/12/09/first-compressed-natural-gas-and-propane-capable-2016-ford-f-150.html.

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Summary and Recommendations

NGVs offer a unique, proven pathway to reducing the emissions and petroleum consumption of the existing vehicle fleet, which is likely to be a growing issue as vehicle lifespans continue to be extended. Accordingly, the existing ecosystem of NGV conversion companies (as exemplified by states like Oklahoma and Utah) as well as OEMs should benefit from regulatory incentives for serving this important potential market.

- Allow EPA-certified converters to "opt in" to the program and generate credits for CNG retrofits and upfits that can subsequently be sold to automakers.

- Provide emission credits for CNG "prep packages" that reduce the costs of subsequent conversion to natural gas, as part of the off-cycle credit technologies listed at 40 C.F.R. § 86.1869–12, *CO_2 credits for off-cycle CO_2-reducing technologies.*

Addressing the Threat of Petroleum Dependence

Issues Addressed:

- *The cost on the producers or purchasers of new motor vehicles or new motor vehicle engines*
- *The impact of the standards on consumer behavior, including but not limited to consumer purchasing behavior and consumer automobile usage behavior (e.g. impacts on rebound, fleet turnover, consumer welfare effects, etc.)*
- *The impact of the standards on the automobile industry*

While EPA's emission regulations under the Clean Air Act serve an important purpose, they currently overshadow the original reason that Congress created the CAFE program in 1975: to reduce America's dependence on the petroleum fuels. The Energy Policy and Conservation Act was a direct response by lawmakers to the catastrophic economic and geopolitical effects of the 1973 oil crisis, but this purpose should also be fresh in the minds of today's policymakers and regulators. Like virtually every other economic recession, the oil price spike of 2007 is widely regarded as triggering the Great Recession in 2008, which devastated the global economy and cost over a hundred thousand jobs in the automotive sector as Chrysler and GM went into bankruptcy.[47]

Much more recently, Hurricane Harvey's devastation seriously disrupted the nation's gasoline fuel supplies[48] – a reminder (along with Superstorm Sandy in 2012[49]) that our dependency on one fuel source poses inherent risks beyond political or economic events.

[47] James Hamilton, "Oil Prices and the Economic Downturn." Testimony Prepared for the Joint Economic Committee of the U.S. Congress (May 20, 2009), https://www.jec.senate.gov/public/_cache/files/a6fca8ca-4c4f-4006-bca5-67e972dc19e2/hamilton-testimony.pdf

[48] Gaurav Sharma, *Hurricane Harvey Has Morphed Into A Major U.S. Gasoline Supply Disruption Event*, FORBES (August 28, 2017), https://www.forbes.com/sites/gauravsharma/2017/08/28/hurricane-harvey-has-morphed-into-a-major-u-s-gasoline-supply-disruption-event/#319555b72872

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The U.S. shale oil boom of recent years, while welcome, does not change this near-total dependence on petroleum fuels, nor the associated vulnerabilities. Despite increased production and exports, we still import nearly half of the oil consumed in this country.[50] Moreover, regardless of the degree of oil imports, the TAR acknowledges that "the price impacts of an oil disruption anywhere will continue to be transmitted to U.S. markets"[51] because oil is a global commodity. And Middle East and North African countries – which have triggered 8 of the 10 oil price shocks in history, and face significant threats from the rise of ISIS and Saudi/Iranian tensions – still account for 30% of global production, a share that the TAR expects to rise.[52]

Despite this ever-present danger hanging over our country, and despite the original intent of the CAFE rules, the TAR chapter on energy security acknowledges that the present regulations will barely make a dent in this dependence. In 2025, the TAR projects that U.S. oil imports will be reduced by 169,000 barrels a day thanks to the rules – less than 6% of imports, which will continue to *rise*, not fall. And with sales of EVs and FCVs projected to be less than 2% of the total market as late as 2030[53] - and NGV sales not projected at all – there is no expectation for alternative fuels to break oil's stranglehold on the transportation sector.

This does not have to be the case. As discussed in previous sections, NGVs are a proven, feasible solution for petroleum-free transportation, with 22 million on the road worldwide and currently-untapped potential for mass-market adoption here in America. In terms of a resource base, the shale gas revolution has created an enormous supply of domestic fossil natural gas supplies, and potential sources of RNG are found in communities and farms across the country. With this combination of a market-ready technology and an abundant, cleaner fuel supply, there is no reason for regulators to give up and resign the country to an oil-dependent future.

This is why restoring the "0.15 divisor" calculation for NGV emissions and removing other unreasonable restrictions on NGV incentives, as discussed earlier in these comments, is so important: not only is it justified based on the game-changing environmental benefits of RNG, but it also returns the joint EPA/NHTSA program to Congress's original purpose in passing the Energy Policy and Conservation Act as well as the Alternative Motor Fuels Act. By effectively removing Congress's CAFE incentives for NGVs, the current EPA rules create a conflict between environmental progress and America's energy security that does not need to exist.

Summary and Recommendations

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[49] Kate Zernike, *Gasoline Runs Short, Adding Woes to Storm Recovery,* N.Y. TIMES (Nov 1, 2012) http://www.nytimes.com/2012/11/02/nyregion/gasoline-shortages-disrupting-recovery-from-hurricane.html?pagewanted=all

[50] *How much petroleum does the United States import and export?* ENERGY INFORMATION ADMINISTRATION (April 4, 2017). https://www.eia.gov/tools/faqs/faq.php?id=727&t=6

[51] Draft TAR, 10-22

[52] *Id.*

[53] *Id.,* 13-64

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The current rules fail to meaningfully address the massive risks to America's economic prosperity and security posed by our near-total dependence on petroleum fuels in transportation. NGVs have unsurpassed potential to provide a practical solution to this dependence, but the current EPA rules effectively undercut the original Congressional intent of the CAFE program and later Congressional incentives for NGVs by eliminating the "0.15 divisor" from emission calculations.

- The potential for NGVs to provide a mass-market solution for petroleum dependence is one more reason for pursuing the comprehensive agenda of reform for NGV regulations discussed in these comments – and making these reforms effective immediately.

NGV Reform Needed Today for 2017-2021 Targets

Issues Addressed:

- *Whether the light-duty vehicle greenhouse gas standards established for model year 2021 are appropriate.*

In addition to the MTE's original focus on the 2022-2025 standards, EPA has also requested comments on whether the standards for 2021 remain appropriate. As with the 2025 targets, we believe that automakers can indeed deliver these reductions in emissions as well as petroleum consumption – but only if they are provided with appropriate incentives that recognize the contributions that NGVs make to these goals.

For all of the reasons discussed in previous sections, we believe that the challenges of meeting the targets without NGVs pose a fundamental threat to the economic viability of U.S. automakers, and thus to the hundreds of thousands of jobs that they support. And, while this challenge is likely to become dire by 2025, it is likely that it will begin impacting automakers sooner, and potentially within the 2017-2021 timeframe. Moreover, automakers will need time to ramp up their production of NGVs, and infrastructure developers like VNG will similarly need time to build fueling networks to serve the light-duty market.

Thus, EPA's desire to review the 2021 targets is an excellent opportunity to make the recommended reforms to NGV incentives sooner, rather than waiting until 2022-2025. By reforming NGV incentives effective immediately, the industry will have the regulatory certainty needed to make these long-term investments and get to work right away. Given the importance of reducing the risks of petroleum dependence to our environment and the economy, there is simply no reason to wait.

Summary and Recommendations

Because the current disparity between the treatment of NGVs and EVs is so clearly arbitrary and contrary to real-world lifecycle GHG emissions, and because automakers need this compliance flexibility and regulatory certainty in order to confidently invest in NGV production, a reform of NGV incentives should be made effective immediately – without waiting for the 2022-

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2025 period. EPA's review of the 2021 targets as part of this proceeding is an opportunity to do so.

- In the process of reviewing the 2021 targets, the agencies should adopt the recommended changes to NGV incentives discussed in these comments effective immediately.

Conclusion and Summary of Recommendations

Discussions of the future of automotive emissions are too often characterized by pessimism from all sides. On one hand, environmentalists have pushed for a widespread adoption of EVs that the EPA's own projections (e.g. the TAR) show is decades away, with very limited penetration projected through 2025. On the other hand, the auto industry argues that it has no way to keep consumers from buying larger and more-polluting vehicles, nor any way to cost-effectively reduce their emissions. And those hoping for an end to the U.S.'s decades-long vulnerability to shocks from global oil markets have little hope at all.

This picture is so gloomy because NGVs are wrongly absent from the conversation. Proven, practical NGV technology and RNG fuel can benefit light truck drivers and the environment in the near term at competitive costs, and next-generation NGVs - with high-octane engines fueled by both RNG and hydrogen-enriched gas - have the potential to dramatically improve the trajectory of these vehicles for decades to come. And with America's unrivaled gas resources, NGVs also have the potential to finally break our near-total dependence on petroleum-based fuels with an affordable, cleaner, domestically-abundant fuel.

The MTE is a critical opportunity for the agencies to correct this glaring oversight. By seriously studying the promise of NGVs and by including a robust suite of incentives for their deployment comparable to those provided to EVs, the agencies can offer a compromise to please all sides. The existing targets for 2025 can be maintained as environmentalists wish; automakers can have an expanded set of compliance pathways that address their area of biggest need - light trucks and full-size pickups; and individual consumers get the vehicles they want and need while reducing petroleum dependence and environmental impacts at a reasonable cost.

In doing so, the agencies can deliver a win-win-win for America in line with the "pro-environment, pro-growth" philosophy espoused by this Administration.[54] VNG looks forward to working with the agencies as the MTE process continues to create a final rule that reduces emissions and petroleum dependence while boosting the domestic economy through maximizing our country's unsurpassed traditional fossil and renewable natural gas resources.

[54] *EPA chief: Trump's energy order sends 'pro-growth, pro-environment message'*, Fox News (Mar. 29, 2017), http://www.foxnews.com/politics/2017/03/29/epa-chief-trumps-energy-order-sends-pro-growth-pro-environment-message.html.

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As a final summary, we recommend the following changes to the rules:

- NGV emissions calculations should return to the "0.15" divisor effective immediately, with emissions calculated as 85% below a gasoline vehicle. This is both justified by the real-world emissions benefits of RNG and is consistent with the CAFE program. The potential for future improvements to NGV emissions from advanced engine technologies, as well as synergies with hydrogen FCVs, provides further justification for this incentive.
    - We recommend reinstating language from the MY 2011-2016 regulations under 40 C.F.R. § 600.510–12, *Calculation of average fuel economy and average carbon-related exhaust emissions*: "For natural gas-fueled model types . . . the carbon-related exhaust emissions value calculated for that model type in accordance with paragraph (b)(2) of this section multiplied by 0.15 and rounded to the nearest gram per mile, except that manufacturers complying with the fleet averaging option for N_2O and CH_4 as allowed under § 86.1818 of this chapter must perform this calculation such that N_2O and CH_4 values are not multiplied by 0.15."
- Offer a "Natural Gas Pickup" incentive similar to current hybrid-electric and "performance-based" pickup credits; however, for the natural gas pickup credit, minimum deployment thresholds should be eliminated to reflect the greater market challenges faced by NGVs - since, unlike hybrid-electrics, they use an alternative fuel.
    - This goal could be accomplished by inserting a new section (c) under 40 C.F.R. § 86.1870–12, *CO_2 credits for qualifying full-size pickup trucks*, titled "Credits for implementation of natural gas technology." The structure of these credits would be similar to those for sections (a) and (b), but with reduced or eliminated requirements for the "required minimum percent of full size pickup trucks."
- Remove the utility factor requirements for a 2:1 ratio of CNG-to-gasoline range, as well as the requirement for dual-fuel NGVs to only use gasoline when the CNG tank is empty.
    - This could be achieved by deleting the requirements in 40 C.F.R. § 600.510–12, *Calculation of average fuel economy and average carbon-related exhaust emissions*, part (c)(2)(vii)(B) for fuel economy and (j)(2)(vii)(B) for emissions.
- Incorporate the potential for use of natural gas when setting targets for practical, achievable emissions improvements for light trucks and full-size pickups. Modeling used to set achievable emissions curves for pickups and light trucks should include natural

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gas as a proven technology at costs based on high-volume adoption, not their current incremental costs at low production volumes.

- Allow EPA-certified converters to "opt in" to the program and generate credits for CNG retrofits and upfits that can subsequently be sold to automakers.

- Provide emission credits for CNG "prep packages" that reduce the costs of subsequent conversion to natural gas, as part of the off-cycle credit technologies listed at 40 C.F.R. § 86.1869–12, *CO_2 credits for off-cycle CO_2-reducing technologies.*

Respectfully submitted,

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Comments by VNG.co LLC on
Reconsideration of the Final Determination of the Mid-Term
Evaluation of Greenhouse Gas Emissions Standards
For Model Year 2022–2025 Light-Duty Vehicles

Docket ID: EPA–HQ–OAR–2015–0827

VNG.co LLC is a developer of compressed natural gas (CNG) fuel dispensing infrastructure for light- and medium-duty natural gas vehicles (NGVs). We welcome this opportunity to comment on the Midterm Evaluation (MTE) of light-duty vehicle greenhouse gas standards established for model years 2022-2025 and provide the agencies[1] with much-needed updated information on NGVs and their ability to contribute to the goals of the regulations.

Indeed, NGVs are perhaps the largest and most consequential knowledge gap in the agencies' work on these regulations to date. The only substantive discussion of NGVs in the 1,217 page Technical Assessment Review (TAR) issued by EPA, NHTSA and CARB was one short paragraph noting the growth in CNG fueling infrastructure,[2] and NGVs were not included in the TAR's models for automaker compliance.[3] This is inexplicable considering that U.S. OEMs (the "Big Three") have each produced pickups that operate on compressed natural gas (CNG) in recent years, as well as the fact that there are 22 million NGVs on the road globally - including many produced by OEMs that also serve the U.S. market.

However, this decision to exclude NGVs from serious analysis becomes even more confounding when one considers the radical changes that have occurred in the emissions profile of this technology since the original rulemaking. Renewable natural gas (RNG) can reduce lifecycle greenhouse emissions by 85% or more compared to gasoline, and this ultra-low carbon biofuel now accounts for over 35% of NGV fueling nationally and over 60% of NGV fueling in California. Furthermore, engine manufacturers are beginning to explore the potential of advanced engine designs to take advantage of CNG's high-octane, inherently low-emission properties - another major opportunity to meet the agencies' goals that has been completely unexplored to date.

The virtual exclusion of NGVs from the analysis and discussion has led to the perception of regulators having a false choice between siding with automakers and consumers on one side and environmentalists on the other. Automakers assert that they cannot stop consumers from buying the larger, less fuel-efficient vehicles they want (and in many cases need), and that meeting the current emissions targets for 2025 would impose major costs and risks on their business. Meanwhile, environmentalists insist that we need to transition our entire vehicle fleet to electric vehicles (including hydrogen fuel cell vehicles) as soon as possible, despite the fact

[1] While these Comments are being submitted in the EPA's docket, it is VNG's expectation that they will be also be considered by the National Highway Traffic Safety Administration (NHTSA) and the California Air Resources Board (CARB), collectively "the agencies."
[2] *Draft Technical Assessment Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025*, ENVIRONMENTAL PROTECTION AGENCY (July 2016), at 9-41, https://nepis.epa.gov/Exe/ZyPDF.cgi/P100OXEO.PDF?Dockey=P100OXEO.PDF (hereinafter "Draft TAR").
[3] *Id.* at 5-502.

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that they are not projected to have more than 1-2% market share through at least 2025 – and are especially unlikely to be a practical choice for SUVs and pickups due to their weight and utility requirements.

NGVs are the missing piece of the puzzle. From an automaker's perspective, they offer a proven pathway to dramatically reducing emissions from their large-footprint vehicles, with similar costs and much greater benefits than lightweighting for pickup trucks. For environmentalists, the use of RNG offers similar or even superior emissions benefits to EVs, while also immediately addressing the segments of the auto market (e.g. light trucks) that are unlikely to have an electric alternative for the foreseeable future.

Reforming the light-duty emission regulations to make NGVs a practical compliance path for automakers thus offers the agencies a way to preserve the stringency of existing targets while simultaneously making it easier for automakers to meet them cost-effectively. Equally important, individual Americans will benefit from the use of a cleaner transportation fuel with lower and more stable pricing, compared to gasoline, all while purchasing the vehicles they want and need at reasonable costs. That's a win-win-win.

The following comments detail the reasons for providing robust regulatory support for NGVs on par with previous regulatory support for EVs, organized into the following sections.

- **The Need for Light Truck Alternatives in a Changing Market Context:** Consumer demand is shifting towards large vehicles with relatively low fuel economy. NGVs are ideally suited to provide a low-emission, non-petroleum alternative for the light truck segment, which is unlikely to be served by electric vehicle (EV) alternatives for the foreseeable future.

- **Renewable Natural Gas - A "Waste-to-Wheels" Emissions Game-Changer:** RNG is a game-changer that puts NGVs on par with an EV powered with wind or solar power - and it accounts for a much higher percentage of NGV fuel use than renewable electricity in the overall electricity mix. The rules must account for this dramatic shift and provide incentives for NGVs similar to those provided for EVs.

- **Potential for Rapid Cost Reductions, Consumer Savings with NGVs:** Unlike EVs, NGVs do not depend on inherently-expensive components like batteries, giving them much greater potential for rapid cost reductions with production at scale. This potential has already been demonstrated by European OEMs and gives NGVs much greater potential for mass-market adoption than the agencies have recognized to date.

- **Importance of Dual-Fuel NGVs:** Dual-fuel (commonly referred to as "bi-fuel") vehicles will play an important role in the market development of NGVs during early years of infrastructure buildout. The agencies took steps towards providing important support for bi-fuel NGVs in the original rulemaking, yet also placed unfair restrictions on this support that were not placed on similarly-important plug-in hybrid electric vehicles.

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- **Advanced NGV Technologies Promise Best Emissions Path for Internal Combustion Engines (ICEs):** The development of new engine technologies optimized for CNG's inherently high-octane, clean-burning qualities gives NGVs unsurpassed potential for environmental performance on a mass-market-ready ICE platform.

- **"Bridge to Hydrogen" Needed More Than Ever:** The agencies have previously recognized the ability of NGVs to provide a "bridge" to hydrogen-fueled vehicles thanks to numerous technology synergies on the vehicle as well as the fueling side. The opportunities for such synergies have expanded in recent years, and are as urgently-needed as ever due to the slow market uptake of hydrogen fuel cell vehicles.

- **Emissions Solution for Mid-Life Vehicles:** Sec. 202(a) of the Clean Air Act requires the agencies to regulate vehicle emissions throughout their useful life, but the current light-duty program only provides incentives for low-emission technologies deployed in *new* vehicles. As states like Oklahoma and Utah have shown, there is significant potential to reduce emissions and petroleum use from older vehicles with CNG retrofits, and these benefits should be recognized and encouraged in these regulations.

- **Addressing the Threat of Petroleum Dependence:** The CAFE program was originally created as a response to the oil crisis of 1973; yet, more than 40 years later, the program has done very little to reduce our near-total dependence on petroleum, and the agencies project that the 2017-2025 rules will not make a meaningful difference either. The current regulations ensure this in part by disadvantaging natural gas, perhaps our best hope for a long-term solution to this problem.

- **NGV Reform Needed Today for 2017-2021 Targets:** Because the current disparity between treatment of NGVs and EVs is so clearly arbitrary and contrary to real-world lifecycle GHG emissions, and because automakers need this compliance flexibility and regulatory certainty in order to confidently invest in NGV production, these changes should be made effective immediately – without waiting for the 2022-2025 period. EPA's review of the 2021 targets as part of this proceeding is an excellent opportunity to do so.

In addition to providing information on each of these topics for use in the rulemaking process, we will indicate the specific topics from EPA's Request for Comment that each section is relevant to, and we will conclude each section with a list of recommended changes to the regulations. By updating the regulations to incentivize the deployment of NGVs similar to the previous administration's focus on incentivizing EVs, the agencies will provide automakers with a greater range of compliance pathways that will help achieve the goals of the regulations sooner and more cost-effectively, to the collective benefit of consumers, the environment and industry.

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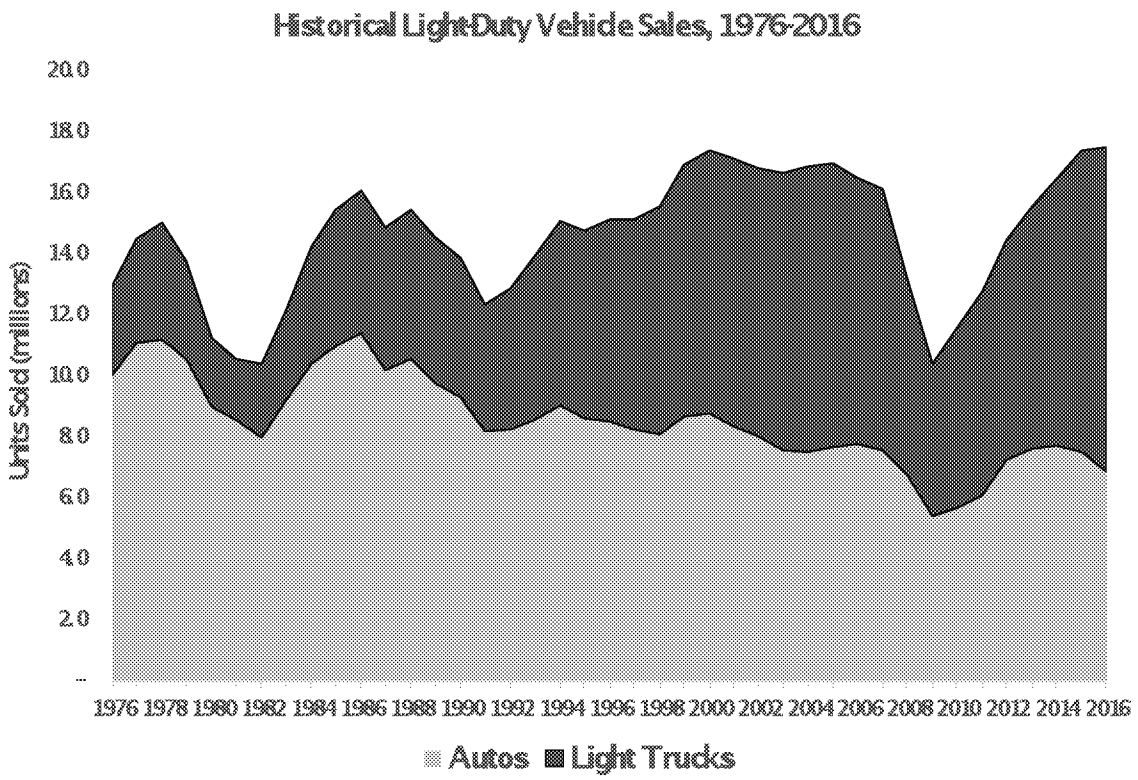
The Need for Light Truck Alternatives in a Changing Market Context

Issues Addressed:

- *The impact of the standards on the automobile industry*
- *The feasibility and practicability of the standards*

As the agencies acknowledged in the 2016 draft Technical Assessment Report (TAR), low gasoline prices have encouraged U.S. consumers to gravitate towards the purchase of larger and less fuel-efficient vehicles. After the Great Recession of 2008 decimated all classes of vehicle sales as well as oil prices, light truck sales have rebounded much more strongly than passenger vehicles and are approaching all-time highs and a market share of over 60%.[4] As the experience of the 1980s-2000s demonstrated, this shift in the market towards light trucks is likely to be sustained if gasoline prices stay low for the long term, as many observers have speculated - including oil majors like Shell, whose CEO recently said that oil prices may be "lower forever."[5]



Source: Bureau of Economic Analysis, 2017[6]

[4] *Auto and Truck Seasonal Adjustment*, BUREAU OF ECONOMIC ANALYSIS (August 2, 2017), https://www.bea.gov/national/xls/gap_hist.xlsx
[5] Sarah Kent, *Shell Prepares for 'Lower Forever' Oil Prices*, WALL ST. J. (July 27, 2017), https://www.wsj.com/articles/royal-dutch-shells-second-quarter-earnings-rise-sharply-1501137915
[6] *Auto and Truck Seasonal Adjustment*, BUREAU OF ECONOMIC ANALYSIS (August 2, 2017), https://www.bea.gov/national/xls/gap_hist.xlsx

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Even if gasoline prices rise again, these large light duty vehicles will always account for a sizable part of the market due to their unique ability to meet specific consumer and business needs. While the footprint-based structure of the rules ensures that automakers will have to increase the fuel economy of all vehicles in order to achieve compliance, the TAR projected that this trend will nonetheless reduce the original projected impacts of the rules on petroleum dependence and greenhouse gas emissions.

The size of light trucks limits the availability of cost-effective solutions to increasing fuel economy and reducing emissions – particularly for full-size pickups, which have added performance requirements. For example, the TAR estimated that the total cost of a 20% mass reduction for towing-capable pickups, which would improve fuel economy and emissions by only 10%, would be roughly $3,000. It is also particularly challenging to electrify light trucks and pickups due to the added cost and weight of the battery packs needed to move these larger vehicles, particularly those built for carrying or towing heavy loads. Indeed, there are very few electric light trucks on the market today and no pickups, and the TAR does not even consider the possibility of electric towing-capable vehicles within the 2025 timeframe.[7]

Pickup trucks are the best-selling vehicles in America, as well as the most important source of profits for the "Big Three" U.S. automakers. Thus, a cost-effective solution to their emissions and petroleum dependence is absolutely essential to ensuring that these companies, their hundreds of thousands of employees, and the millions of consumers and businesses that rely on pickup trucks are not unnecessarily harmed by the agencies' regulations.

Fortunately, and in contrast to electrification, compressed natural gas (CNG) is ideally suited to be a low-emission, non-petroleum alternative fuel for light trucks and pickups especially. Larger vehicle envelopes provide ample room for CNG storage tanks, and since natural gas offers far greater energy density than batteries, it is much better-suited for moving heavy vehicles. These characteristics are why natural gas has long been the clean fuel of choice for heavy-duty vehicles like transit buses and refuse trucks, and the same logic holds true for the heavier side of the light-duty vehicle spectrum.

Indeed, automakers have demonstrated that NGVs are already a viable commercial technology. All three U.S. automakers have offered either CNG-equipped or CNG-ready versions of their flagship full-size pickups, including GM's Chevy Silverado,[8] FCA's Dodge Ram,[9] and Ford's F-

[7] Draft TAR, supra note 2, at 4-40.
[8] Brandon Turkus, *2015 Chevy Silverado HD gets CNG option*, AUTOBLOG (Feb. 6, 2014), http://www.autoblog.com/2014/02/06/2015-chevrolet-silverado-hd-cng-official/.
[9] Richard Truett, *Ram will expand lineup of CNG-powered trucks*, AUTOMOTIVE NEWS (Mar. 4, 2015), http://www.autonews.com/article/20150304/OEM05/150309913/ram-will-expand-lineup-of-cng-powered-trucks.

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150. In fact, in addition to being the best-selling vehicle of any model, the 2016 Ford F-150 was named Green Car Journal's "Green Car of the Year" in part due to the availability of a CNG prep package as an option.[10]

Thus, the rules should encourage automakers to transition these vehicle segments to natural gas in two ways. First, they should be provided strong incentives to do so, including special incentives for pickup trucks similar to the incentive previously created for hybrid-electric pickups. Second, natural gas should be factored into setting targets for what can be reasonably achieved for light trucks and pickups, since this is a mature, proven, commercially-available technology that automakers have already deployed in recent years.

Summary and Recommendations

Because light trucks and pickups especially are a critical market segment for consumers, businesses and automakers, and because neither electrification nor lightweighting are practical alternatives for these heavier vehicles, EPA should provide a clear regulatory pathway for automakers to transition these segments to natural gas.

- Provide emissions credits for all NGVs that reflect the emissions benefits of renewable natural gas (RNG), as discussed in the following section.

- Offer a "Natural Gas Pickup" incentive similar to current hybrid-electric and "performance-based" pickup credits; however, for the natural gas pickup credit, minimum deployment thresholds should be eliminated to reflect the greater market challenges faced by NGVs - since, unlike hybrid-electrics, they use an alternative fuel. Expecting an automaker to immediately transition at least 10% of their critical pickup fleet to an alternative fuel is simply not realistic, and renders the current "performance-based" credit useless despite the fact that natural gas can meet the credit's performance threshold of 20% emission reductions.

    - This goal could be accomplished by inserting a new section (c) under 40 C.F.R. § 86.1870–12, *CO_2 credits for qualifying full-size pickup trucks*, titled "Credits for implementation of natural gas technology." The structure of these credits would be similar to those for sections (a) and (b), but with reduced or eliminated requirements for the "required minimum percent of full size pickup trucks."

[10] *Fuel Efficiency, Alternative Fuels and Sustainability Earn Ford F-150 2016 Green Truck of the Year Award*, FORD MOTOR CO. (Nov. 19, 2015), https://media.ford.com/content/fordmedia/fna/us/en/news/2015/11/19/ford-f-150-earns-2016-green-truck-of-the-year-award.html.

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- Incorporate the use of natural gas when setting targets for practical, achievable emissions improvements for light trucks and full-size pickups.

Renewable Natural Gas - A "Waste-to-Wheels" Emissions Game-Changer

Issues Addressed:

- *The availability and effectiveness of technology, and the appropriate lead time for introduction of technology*
- *Any relevant information in light of newly available information.*
- *The impact of the greenhouse gas emission standards on the Corporate Average Fuel Economy standards and a national harmonized program*

Since the original rulemaking, there has been a dramatic transformation of the lifecycle emissions profile of NGVs due to the rapid adoption of renewable natural gas (RNG) in the transportation sector. Indeed, this is likely the biggest change in the lifecycle emissions of any fuel or vehicle type since the 2011 rulemaking – yet it was completely absent in the draft TAR for reasons that are not clear.

RNG, also known as biogas or biomethane, captures methane produced from a variety of sources including landfills, dairy and livestock operations, and wastewater treatment plants. Once impurities are removed, this methane can be used as a perfect substitute for fossil natural gas, including distribution in the existing natural gas pipeline system and use in NGVs.

Since methane is a powerful greenhouse gas, the use of RNG can achieve massive emission reductions on a CO2-equivalent basis when used as a transportation fuel. While lifecycle emissions can vary significantly depending on the pathway for RNG production, according to the most recent values for the California Low Carbon Fuel Standard (LCFS) it can yield emission cuts of between 70% and *130%*[11] - in other words, NGVs powered by RNG can be carbon-negative, potentially yielding even greater emissions benefits than an electric vehicle powered entirely by solar or wind energy.

[11] Staff Report, CALIFORNIA AIR RESOURCES BOARD, Proposed Re-Adoption of the California Low Carbon Fuel Standard. Dec. 2014. https://www.arb.ca.gov/regact/2015/lcfs2015/lcfs15isor.pdf.

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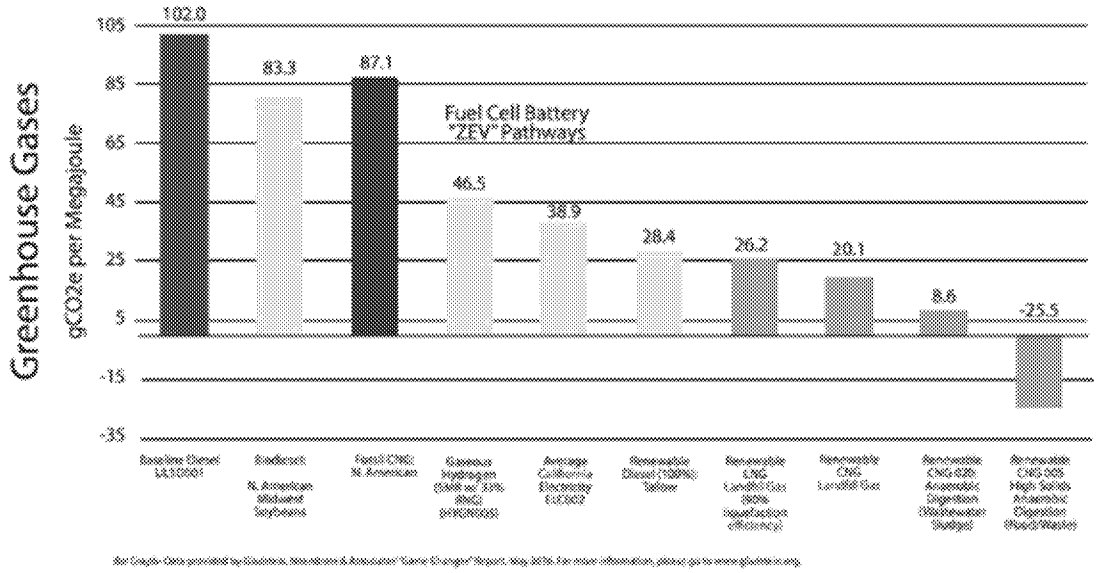

Source: Gladstein, Neandross & Associates[12]

In the original 2017-2025 rulemaking, EPA recognized the potential for RNG to deliver "game-changing" lifecycle GHG emissions for NGVs, but stated that the agency "believe[d] that biomethane will remain a small part of the overall natural gas market for the foreseeable future."[13] This belief is, simply put, outdated. Today, RNG fueling is increasingly the norm for NGVs thanks to the federal Renewable Fuel Standard (RFS) and the California Low Carbon Fuel Standard (LCFS). While these programs were in their infancy during the original rulemaking in 2011, they have since emerged as powerful economic drivers for RNG use in transportation, thanks to the reclassification of RNG as a cellulosic biofuel by EPA[14] as well as CARB's ranking of it as the lowest GHG fuel on the market. [15] Today, the value of these RFS and LCFS credits has made RNG commercially competitive with fossil natural gas.[16]

This economic driver has led to the very rapid increase in the production and sale of RNG fuel to the transportation sector – particularly in California, where fuel retailers can benefit from sales of both LCFS and RFS credits and where there are the largest number of NGVs and natural gas fueling stations. According to the RNG Coalition, over 60% of NGV fueling in California and 35%

[12] *Game-Changer: Next Generation Heavy Duty Natural Gas Engines Fueled By Renewable Natural Gas*, GLADSTEIN, NEANDROSS AND ASSOCIATES (May 2016), http://ngvgamechanger.com/pdfs/GameChanger_FullReport.pdf
[13] 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, 77 Fed. Reg. 62815 (Oct. 15, 2012) (hereinafter "*2012 Light Duty GHG Standards*").
[14] "Renewable Fuel Pathways II Final Rule to Identify Additional Fuel Pathways under Renewable Fuel Standard Program Documents." ENVIRONMENTAL PROTECTION AGENCY. July 18, 2014. https://www.epa.gov/renewable-fuel-standard-program/renewable-fuel-pathways-ii-final-rule-identify-additional-fuel-0
[15] Staff Report, CALIFORNIA AIR RESOURCES BOARD, Proposed Re-Adoption of the California Low Carbon Fuel Standard (Dec. 2014), https://www.arb.ca.gov/regact/2015/lcfs2015/lcfs15isor.pdf
[16] *The Feasibility of Renewable Natural Gas as a Large-Scale, Low Carbon Substitute*, UC DAVIS INSTITUTE OF TRANSPORTATION STUDIES, June 2016. https://www.arb.ca.gov/research/apr/past/13-307.pdf

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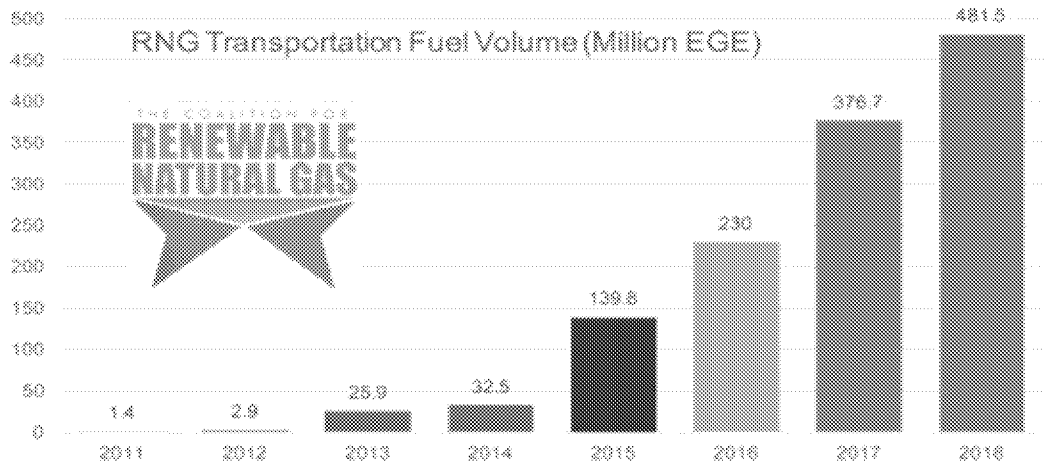
nationally comes from RNG.[17] In terms of absolute volumes, RNG fuel use in transportation increased fivefold between 2013 and 2015, and the Coalition projects it will more than quadruple between 2015 and 2018.



Source: RNG Coalition, Fleets & Fuels Magazine[18]

With this trajectory of RNG growth, the emissions benefits of NGVs today are already at least as powerful as EVs and likely even greater. Thus, ignoring the growth of RNG is not only outdated, but it renders the regulations ineffective in their stated goal of reducing GHG emissions. It also inhibits job creation not only in the NGV industry but the RNG industry as well, which has the potential to create jobs at farms and municipalities across the country through the capture and sale of locally-produced renewable fuel.

In addition to missing an opportunity to achieve the goals of the regulations, the failure to recognize the emissions benefits of RNG has also resulted in EPA effectively negating Congressional incentives for NGVs under the CAFE program. According to Sec. 6 of the Alternative Motor Fuels Act (AMFA)[19] codified as 49 U.S. Code § 32905, the fuel economy of NGVs and EVs alike is to be calculated using the Petroleum Equivalency Factor (PEF) that treats every gallon-equivalent of compressed natural gas or equivalent electrical energy as 0.15 gallons of gasoline. The goal of this technology-neutral statutory calculation was to provide automakers with a strong incentive to manufacture ***both*** types of alternative fuel vehicles to achieve the goal of American energy independence. By encouraging the production of vehicles that reduce the use of higher-carbon petroleum fuels, the statute also reduces emissions.

While the statute requires that NGVs and EVs be treated the same in terms of measuring fuel economy, there is no equivalent law governing measurement of GHGs. EPA chose to follow

[17] Patrick Couch, *RNG in California: More Than You Think*, FLEETS AND FUELS (Apr. 20, 2016), http://www.fleetsandfuels.com/fuels/cng/2016/04/rng-in-california-more-than-you-think/.
[18] *Id.*
[19] Alternative Motor Fuels Act of 1988, Public Law 100-494, 102 Stat. 2441.

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Congressional CAFE incentives through model year (MY) 2015[20] but thereafter to give NGVs credit for only their tailpipe emissions reductions of approximately 20% compared to gasoline instead of the "0.15 divisor,"[21] while temporarily treating EVs as having *zero* emissions.[22] In its original 2017-2025 rulemaking, EPA acknowledged that this calculation for EVs failed to account for the upstream emissions produced by EVs from power generation but claimed that the long-term potential of EVs to produce "game-changing" emissions when charged with renewable electricity justified this unprecedented incentive.[23]

By contrast, in the same rulemaking EPA recognized the potential for RNG to deliver "game-changing" lifecycle GHG emissions for NGVs, but stated that the agency "believe[d] that biomethane will remain a small part of the overall natural gas market for the foreseeable future."[24] As discussed above, this expectation has been proven wrong for natural gas transportation. To be consistent with this new reality and the goals of the regulation, as well as with the goal of harmonizing EPA's regulations with the statutory CAFE program, the rules should give *both* fuels incentives that reflect their "game-changing" emissions potential: for NGVs, this means credits that are equivalent to 100% RNG fueling, in the same way that the 0 g/mi incentive for EVs is equivalent to the use of 100% renewable electricity.

It would be justifiable to calculate the emissions of a 100% RNG-fueled NGV as 85% below that of a gasoline vehicle - which would be in line with the average cited in the NPC's topic paper on the subject[25] as well as a return to the "0.15 divisor" in line with CAFE's PEF calculation. And, because the present bias towards EV incentives represents the most egregious inconsistency of EPA's regulations with the CAFE program, we believe it is also justifiable to make this change effective immediately, instead of waiting for 2022.

Summary and Recommendations

RNG has transformed the emissions of NGVs since the original rulemaking, accounting for 35% of NGV fueling nationally and delivering emission reductions of 70% to 130%. Because of this game-changing emissions potential, and because existing EPA incentives for alternative fuels are biased towards EVs and disruptive of Congressionally-mandated CAFE incentives for NGVs, the emission calculation for NGVs should be reformed effective immediately.

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[20] Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards, 75 Fed. Reg. 25716 (May 7, 2010)
[21] *2012 Light Duty GHG Standards* at 62623, 62816.
[22] *Id.* at 62819.
[23] *Id. at* 62820.
[24] *Id.* at 62815.
[25] Report, NATIONAL PETROLEUM COUNCIL, *Advancing Technology for America's Transportation* (2012), http://www.npc.org/reports/trans.html.

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- NGV emissions calculations should return to the "0.15" divisor used before 2016, with emissions calculated as 85% below a gasoline vehicle. This is both justified by the real-world emissions benefits of RNG and is consistent with the CAFE program.

    - We recommend reinstating language from the MY 2011-2016 regulations under 40 C.F.R. § 600.510–12, *Calculation of average fuel economy and average carbon-related exhaust emissions*: "For natural gas-fueled model types . . . the carbon-related exhaust emissions value calculated for that model type in accordance with paragraph (b)(2) of this section multiplied by 0.15 and rounded to the nearest gram per mile, except that manufacturers complying with the fleet averaging option for N_2O and CH_4 as allowed under § 86.1818 of this chapter must perform this calculation such that N_2O and CH_4 values are not multiplied by 0.15.[26]"

- This change should be effective retroactively to model year 2017, given the major impediment to NGV adoption posed by the current incentive structure as well as the uniquely egregious regulatory overreach it represents compared to the CAFE program.

- To mirror EV incentives, EPA could consider a similar volume-based transition after 2022 to a regime that considers the real-world use of RNG just as EV incentives will ultimately be calculated based on real-world lifecycle emissions; this would be relatively simple to do since EPA already tracks RNG use under the RFS program.

Potential For Rapid Cost Reductions, Consumer Savings with NGVs

Issues Addressed:
- *The cost on the producers or purchasers of new motor vehicles*
- *The feasibility and practicability of the standards*

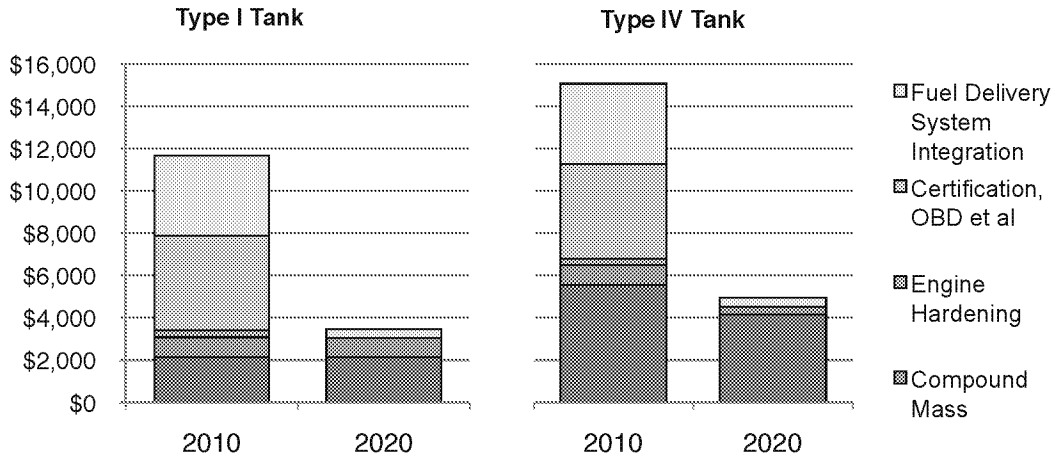
As part of a shift towards a serious analysis of NGVs in the MTE, the agencies must consider not only the current costs of NGVs but their potential for very rapid cost reductions with production at scale. Indeed, while the current incremental prices of CNG pickups are typically $10,000 or more (including upfitting costs), these high costs are primarily due to the need to spread significant up-front design and certification costs over a small number of vehicle sales.

The 2012 report "Advancing Technologies for America's Transportation Future" by the National Petroleum Council (NPC) estimates that about two thirds of the incremental cost of a NGV pickup comes from these areas, and that incremental costs could be reduced to $3,500 per vehicle by 2020 simply by moving to high-volume production (over 100,000 vehicles per year).[27]

[26] 40 C.F.R. § 600.510–12(j)(2)(iii)(A).
[27] Report, NATIONAL PETROLEUM COUNCIL, *Advancing Technology for America's Transportation* (2012), http://www.npc.org/reports/trans.html.

These projections are based in part on experiences in major NGV markets in Europe like Italy and Germany, where volume production has driven incremental costs down to $3,000 or less.[28]

Projected NGV Pickup Incremental Costs, National Petroleum Council



This compares very favorably to the current and projected incremental costs of electric and plug-in electric vehicles. Unlike NGVs, which use the same internal combustion engine platforms as gasoline vehicles and mostly only require the addition of a compressed gas tank made of steel or composites, EVs use batteries that require numerous expensive components and can only reduce costs relatively slowly. This is a critical difference for the agencies to incorporate into their planning, given much greater potential for near-term mass-market adoption of NGVs.

The mass-market potential of NGVs is due to the combination of (potentially) low incremental costs along with the lower and more stable price of natural gas compared to petroleum fuels, which allows the incremental cost to be recouped relatively quickly. According to modeling done in conjunction with the NPC study, this combination gave NGVs the potential to achieve a 17 percent light-duty vehicle market share by 2020 - more than twice the combined market share of electric and plug-in electric vehicles given their projected cost improvements.[29] While this 2012 forecast is clearly unrealistic from the perspective of 2017, the impressive potential for mass-market adoption of a cleaner fuel - and *much* cleaner when RNG is used instead of fossil natural gas - remains an opportunity that should be seriously considered in the agencies' analysis and target-setting.

Indeed, putting aside the comparison to EVs, the potential incremental costs for NGV pickups are comparable to the projected costs for 20% mass reduction via lightweighting cited earlier - $3,000 per pickup. However, as previously stated, lightweighting is forecasted to yield a fuel economy and emissions improvement of only 10%. NGV pickups at scale would have a similar

[28] Rohan Nath et al., *A Realistic View of CNG Vehicles in the US*, BCG PERSPECTIVES (June 16, 2014), https://www.bcgperspectives.com/content/articles/energy_environment_automotive_realistic_view_cng_vehicles_us/.
[29] *Id.*

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incremental cost, yet deliver *twice* the emission reductions with fossil natural gas and many times that with RNG. NGV pickups also completely eliminate petroleum dependence, protecting this critical market segment (and all the consumers, businesses, and workers that depend on it) from oil price swings.

Thus, natural gas deserves to be included in the formulation of the targets for pickups and other light trucks just like other fuel efficiency technologies that have been proven to be cost-effective at scale. This would significantly increase the achievable fuel economy and emissions improvements for these segments within the timeframe of the rulemaking and thus provides a strong rationale for potentially maintaining the existing targets. [30]

Summary and Recommendations

Because NGVs have been proven to deliver rapid and deep cost reductions with high-volume production, the agencies should incorporate them as such into their analysis.

- Modeling used to set achievable emissions curves for pickups and light trucks should include natural gas as a proven technology at costs based on high-volume adoption, not their current incremental costs at low production volumes.

Importance of Dual-Fuel NGVs

Issues Addressed:
- *The impact of the standards on the automobile industry*
- *The feasibility and practicability of the standards*

Dual-fuel NGVs (referred to in the industry as "bi-fuel" NGVs) that operate primarily on CNG but can also operate on gasoline as a backup fuel are likely to play a critical role in winning market adoption of NGVs more broadly. The ability to fuel on gasoline as a backup fuel effectively eliminates consumers' "range anxiety" while CNG fueling infrastructure is not yet as widely available as gasoline, in the same way that dual-fuel electric vehicles (referred to in the industry as plug-in hybrid electric vehicles, or PHEVs) like GM's Chevy Volt have played an important role in expanding the early market for EVs.

The 2017-2025 rulemaking made a major stride towards recognizing the potential benefits of dual-fuel NGVs, which had previously only been assumed to fuel on CNG for 50% of the time. EPA recognized that drivers purchasing dual-fuel NGVs as well as PHEVs are likely to live in areas where fueling (or charging, respectively) infrastructure is reasonably available, and will also preferentially use these alternative fuels whenever possible given their lower cost

[30] Starting the NPC's eight-year projection in 2017 instead of 2012 would imply that an NGV market share of 17 percent could be achieved by 2025 with huge reductions of emissions and petroleum consumption.

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compared to gasoline. Thus, the rules allowed automakers to calculate the fuel usage of both dual-fuel NGVs and PHEVs using a method called the "utility factor" which bases relative consumption of alternative fuels versus gasoline on the vehicle's range on the alternative fuel.[31]

Using this method, a dual-fuel NGV with 250 miles of CNG range – such as the 2015 Dodge Ram[32] – would be assumed to operate on CNG 97.1% of the time, making them nearly as beneficial as a dedicated NGV. PHEVs would receive a similar calculation, although their much shorter all-electric range makes the incentive relatively less beneficial. For example, in the original rulemaking EPA estimated that the Chevy Volt would receive a utility factor of 69% for an all-electric range of 50 miles. [33]

However, despite the fact that utility factors for dual-fuels are ostensibly to be calculated based on their range on alternative fuels, EPA has saddled dual-fuel NGVs with a unique and onerous additional requirement: they must have a CNG range at least double that of their gasoline range in order to qualify for the utility factor calculation, or else they default to an assumed baseline 50% CNG fuel use.[34] Not only that, to be eligible for the incentive, the dual-fuel NGVs must be designed to only use gasoline when the CNG tank is empty.

This requirement is inconsistent with the EPA's assumption that dual-fuel vehicles will fuel as often as possible on CNG for economic reasons, which would imply that their proportion of CNG use should be solely determined by their CNG range according to the utility factors – and not by their gasoline range. Adding further inconsistency, PHEVs face no such requirements, despite the fact of their much more limited all-electric range.

In addition to rendering incentives for dual-fuel NGVs less effective, this requirement adds marketing challenges and, significantly, unnecessary costs to automakers and consumers. To date, the configurations offered by automakers have focused on vehicles that maintain full range on gasoline in order to provide as long of a combined range as possible as well as flexibility; for instance, the dual-fuel GM Silverado has a combined CNG and gasoline range of 650 miles (with the majority coming from gasoline) and allows drivers to switch fuels by flipping a switch.[35]

Beyond unnecessarily restricting customer appeal, the CNG-to-gasoline driving range requirement would require automakers to reduce the size and capacity of the existing gasoline fueling systems in dual-fuel NGVs, which will impose additional costs on manufacturers that will

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[31] *2012 Light Duty GHG Standards* at 62829.
[32] Richard Truett, *Ram will expand lineup of CNG-powered trucks*, AUTOMOTIVE NEWS (Mar. 4, 2015), http://www.autonews.com/article/20150304/OEM05/150309913/ram-will-expand-lineup-of-cng-powered-trucks.
[33] *2012 Light Duty GHG Standards* at 62828.
[34] *Id.* at 62829.
[35] Brandon Turkus, *2015 Chevy Silverado HD gets CNG option*, AUTOBLOG (Feb. 6, 2014), http://www.autoblog.com/2014/02/06/2015-chevrolet-silverado-hd-cng-official/.

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have to be passed on to consumers. Today's dual-fuel pickup truck designs leave the existing gasoline fueling systems intact and simply add CNG storage capacity by placing the CNG tank in the bed of the pickup truck. Downsizing the gasoline fueling system would require additional design, manufacturing, and certification costs that would serve no purpose other than meeting an arbitrary and unnecessary regulatory requirement.

Of course, automakers could also pursue an alternative pathway and maintain the existing gasoline tank size and instead greatly increase CNG fueling capacity. However, this would require tripling or quadrupling the number of CNG tanks currently installed in vehicles like the dual-fuel Dodge Ram, which would add so much weight and take up so much space in the pickup bed that it would be completely unusable for the work fleets that depend on these vehicles. Once again, the current requirement forces automakers to make changes that would increase costs and reduce market acceptance in order to receive full regulatory benefits.

Allowing all NGVs to receive the full utility factor credit for CNG use would remove an unnecessary, ineffective, and arbitrary regulatory impediment to the development of this crucial market segment for stimulating growth in the wider NGV industry.

Summary and Recommendations

Because dual-fuel NGVs are critical for market development and consumer acceptance, and because the agencies should strive to be consistently technology-neutral in their incentives, the unique requirements for dual-fuel NGVs to receive credits based on utility factor calculations should be eliminated.

- Remove the utility factor requirements for a 2:1 ratio of CNG-to-gasoline range, as well as the requirement for dual-fuel NGVs to only use gasoline when the CNG tank is empty.
    - This goal could be achieved by deleting the requirements contained in 40 C.F.R. § 600.510–12, *Calculation of average fuel economy and average carbon-related exhaust emissions*, part (c)(2)(vii)(B) for fuel economy and (j)(2)(vii)(B) for emissions.

Advanced NGV Technologies Promise Best Emissions Path For ICEs

Issues Addressed:

- *The impact of the standards on advanced fuels technology, including but not limited to the potential for high-octane blends*
- *The impact of the standards on compliance with other air quality standards;*
- *The availability of realistic technological concepts for improving efficiency in automobiles that consumers demand, as well as any indirect impacts on emissions;*

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Going beyond today's NGV technology, the agencies should consider the enormous untapped potential of natural gas to deliver even greater environmental and fuel economy benefits in the future. As the highest-octane, cleanest hydrocarbon fuel, natural gas has very favorable physical properties for unsurpassed performance from an internal combustion engine – if automakers are sufficiently incentivized to invest in developing this fuel to its full potential.

Natural gas has 130 octane, far beyond what gasoline – even ethanol-blended gasoline – can provide. In the "Advancing Technologies for America's Transportation Future" study, the NPC projected that this could yield fuel economy up to double that of conventional vehicles when combined with direct injection technologies that fully utilize the properties of CNG.[36] The leading CNG conversion company Westport Innovations is already investigating the potential for natural gas-fueled advanced powertrains that exploit these properties for pickup trucks, with a turbocharged direct injection platform that could reduce carbon emissions by at least 30%.[37]

The potential environmental benefits of CNG aren't limited to greenhouse gases. In 2015, Cummins Westport International (CWI) introduced a heavy-duty CNG engine that was the first engine of any kind to meet the California Air Resources Board (CARB) optional low-NOx emission standard of 0.02 g/bhp-hr NOx – 90% below the 2010 EPA certification level.[38] Owing to the inherently cleaner chemistry of natural gas compared to petroleum-based fuels, similar improvements in performance for NOx emissions could likely be achieved for light-duty vehicles given sufficient automaker interest and investment. While NOx emissions are much lower for gasoline-fueled vehicles compared to diesel vehicles, they are still significant, making this a major untapped opportunity to address smog-forming emissions on our roads.

Agency staff should study the potential of advanced technology to further improve the emissions profile of NGVs, in the same in-depth manner that it has investigated the current and future state of EV and FCV technology. Furthermore, it should incorporate this potential in its assessment of the "game-changing" potential of NGVs as justification for strong incentives.

Summary and Recommendations

[36] Report, NATIONAL PETROLEUM COUNCIL, *Advancing Technology for America's Transportation* (2012), http://www.npc.org/reports/trans.html.
[37] *Methane: The Performance Fuel*, WESTPORT INNOVATIONS (October 2015) https://cleancities.energy.gov/files/u/news_events/document/document_url/128/Brad_Douville__Westport_NGVTF_.pdf
[38] *Game-Changer: Next Generation Heavy Duty Natural Gas Engines Fueled By Renewable Natural Gas*, GLADSTEIN, NEANDROSS AND ASSOCIATES (May 2016), http://ngvgamechanger.com/pdfs/GameChanger_FullReport.pdf

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Because of the high-octane, low-emission properties of natural gas, the agencies should fully study the ability of advanced NGV technologies to further reduce CO2 and smog-forming pollutants and incorporate the results into regulatory incentives and long-term target setting.

- The ability of NGVs to deliver unsurpassed fuel economy for an ICE vehicle should be used as a further rationale for returning to the use of the "0.15 divisor" for calculating NGV emissions, as discussed in the above section on RNG.

"Bridge to Hydrogen" Needed More Than Ever

Issues Addressed:
- *The availability and effectiveness of technology, and the appropriate lead time for introduction of technology*
- *Any relevant information in light of newly available information.*

In awarding advanced technology multiplier incentives to NGVs, the original light-duty vehicle rulemaking in 2012 recognized that there are numerous technical synergies between the development and commercialization of NGVs and hydrogen fuel cell electric vehicles (FCVs) owing to the physical similarities between methane and hydrogen. The agencies wrote that "CNG investments have the potential to facilitate the introduction of hydrogen FCVs in several respects," including innovations in advanced storage materials and tube trailer designs, improved designs for compressors and fuel dispensers, and on-site production of hydrogen from natural gas feedstock. VNG helped to lay out this rationale in a white paper, "NGVs: An Essential Bridge to Hydrogen," commissioned from the consultancy Energy Futures.[39]

Since 2012, the FCV industry has taken its first steps towards commercialization, with Toyota, Honda, and Hyundai each offering models for the U.S. market. The TAR was cautiously optimistic about the uptake of these technologies, with an estimated 125,000 FCVs deployed in California by 2025 thanks to the Zero Emissions Vehicle (ZEV) mandate. However, this does not mean they are fully commercial technologies; indeed, it means that the need for NGV synergies to accelerate the development of this market has been elevated from the realm of the theoretical to the practical. The need is particularly urgent in the area of hydrogen fueling infrastructure, as the TAR estimated that hydrogen fuel demand could begin to outpace infrastructure availability as early as 2019 and as late as 2026.

As noted in the original rulemaking, some of the strongest synergies between these fuels are in the area of infrastructure development. Both CNG and hydrogen fueling stations require the same types of equipment, including compressors, high-pressure storage tanks, and gaseous fuel dispensers. Shared standards, equipment designs, production and operational economies

[39] *Natural Gas: An Essential Bridge to Hydrogen Fuel Cell Vehicles,* ENERGY FUTURES (2011) http://vng.co/wp-content/uploads/2012/05/Natural-Gas-An-Essential-Bridge-To-Hydrogen-Fuel-Cell-Vehicles.pdf

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of scale, and technology innovations in this area could simultaneously drive down costs for both fuels. The September 2014 report "Transitioning the Transportation Sector: Exploring the Intersection of Hydrogen Fuel Cell and Natural Gas Vehicles" by the Sandia National Laboratory[40] goes further, with a concept design for a combined hydrogen and natural gas fueling station that "could improve operational expenditures and also take advantage of common supply chains."

The TAR also noted that "implementation of renewable hydrogen sourcing has posed a financial challenge" for stations developed to date, despite a minimum renewable content of 33% to receive grants from the California Energy Commission and greater incentives for 100% renewable hydrogen stations. RNG is an ideal feedstock for renewable hydrogen production via steam methane reforming (SMR) technology, but the market for FCVs is currently too small to drive widespread development of these resources. As discussed earlier in these comments, increasing the deployment of RNG-fueled NGVs is key to building the market and growing demand for this ultra-low GHG fuel in the near term, ensuring sufficient supplies of RNG for renewable hydrogen production in the longer term.

Finally, these synergies may also yield benefits in the opposite direction, with advances in hydrogen improving the emissions profile of NGVs. The TAR recognizes the potential benefits of power-to-gas applications, in which large-scale wind and solar generation can be used to create hydrogen for blending into natural gas pipelines. While it is discussed in the context of reducing the lifecycle emissions of hydrogen production, this is also clearly relevant to reducing the lifecycle emissions of CNG. The 2013 report "Blending Hydrogen into Natural Gas Pipeline Networks" by the National Renewable Energy Laboratory[41] estimates that natural gas pipelines could accommodate blends of 5-20% hydrogen content with no technical changes by end users (e.g. NGVs), which would not only reduce the overall carbon content of natural gas but also reduce methane leakage from the pipeline system (since hydrogen, as a lighter molecule, would escape from leaks first and 'crowd out' methane).

The NREL report notes that "conceivably, a credit trading system could apply to natural gas with a specified blend content of renewable hydrogen, paralleling the renewable energy credit system used in the electricity sector." In fact, such programs already exist in the transportation sector: the LCFS and RFS programs both allow for the addition of new low-carbon and renewable fuel pathways, and renewable hydrogen-enriched natural gas sold as fuel for NGVs could readily fit within these schema. As with RNG, NGVs can play a crucial role in building this

[40] *Transitioning the Transportation Sector: Exploring the Intersection of Hydrogen Fuel Cell and Natural Gas Vehicles*, SANDIA NATIONAL LABORATORY (2014), https://energy.gov/sites/prod/files/2015/02/f19/2015-01_H2NG-Report-FINAL.pdf

[41] *Blending Hydrogen into Natural Gas Pipeline Networks: A Review of Key Issues*, NATIONAL RENEWABLE ENERGY LABORATORY (2013), http://www1.eere.energy.gov/hydrogenandfuelcells/pdfs/blending_h2_nat_gas_pipeline.pdf

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market in the near term to ensure the availability of renewable, low-emission feedstocks for hydrogen fuel production in the long term.

In all these ways, NGVs could provide much-needed boosts to the development of the FCV industry. On the commercialization side, NGVs will help stimulate adoption of FCVs through lower costs and expanded infrastructure availability, and on the environmental side the expansion of availability of renewable gas feedstocks will maximize the climate benefits of these vehicles. Indeed, NGVs and FCVs should be considered part of the same gaseous fuel pathway and recognized as such in regulations that fully account for and promote the lifecycle benefits of ultra-low GHG gaseous fuel blends.

Summary and Recommendations

The widespread adoption of RNG fueling for NGVs has only increased the synergies between NGVs and FCVs. As such, the agencies should continue to recognize the linkage between these fuels as part of an advanced gaseous fuel pathway for game-changing, long-term emission reductions.

- The mutually-reinforcing ability of both NGVs and FCVs to deliver "game-changing" emission reductions should be used as a further rationale for returning to the use of the "0.15 divisor" for calculating NGV emissions, as discussed in the above section on RNG.

Emissions Solution for Mid-Life Vehicles

Issues Addressed:
- *The impact of the standards on consumer behavior, including but not limited to consumer purchasing behavior and consumer automobile usage behavior.*

Sec. 202(a) of the Clean Air Act requires the agencies to regulate vehicle emissions throughout their useful life, but the current light-duty program only provides incentives for low-emission technologies deployed in *new* vehicles. This is becoming an issue because the past decade has seen a slow, steady increase in the average life of vehicles on our roads, and particularly for light trucks. According to data from the Bureau of Transportation Statistics, the average life of cars on US roads has increased from 9.5 years in 2005 to 11.5 years in 2015[42] - surpassing the 10 year vehicle life currently considered by the agencies.

This trend will likely continue and accelerate if regulations drive up the cost of new vehicles by thousands of dollars, as the agencies themselves have estimated. This will encourage drivers to hold onto their older, less fuel-efficient, and more polluting cars and light trucks for longer and longer, undermining the benefits of the regulations.

[42] *Transportation Energy Databook 2016*, OAK RIDGE NATIONAL LABORATORY, http://cta.ornl.gov/data/index.shtml

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With conventional gasoline cars and trucks, it is essentially impossible to improve the fuel economy and emissions of a given vehicle after it rolls off the assembly line. However, retrofitting existing vehicles to fuel on natural gas has long been a major part of the NGV industry, particularly in states like Oklahoma[43] and Utah[44] that have actively sought to promote the retrofit market. The robust retrofit ecosystem in place for NGVs is fully capable of addressing this market, and the updated certification requirements for remarketed and used vehicles established by EPA in 2012[45] could make this a very cost-effective way to deliver real emissions and petroleum consumption benefits.

While expanding the rules to include emission and petroleum reductions from vehicles that have already been sold is novel, the environmental and energy security benefits that would result are just as meaningful as those stemming from sales of cleaner, more efficient new vehicles.

One way to incentivize retrofits of existing vehicles would be to allow EPA-certified conversion companies to "opt in" to the regulation for the purpose of generating credits for every vehicle they retrofit to operate on natural gas. These credits would be pro-rated based on the vehicle's projected remaining useful life - for instance, a vehicle that is five years old (halfway through the current 10 year/100,000 mile definition of useful life used by the agencies) would receive credits equal to 50% of the emissions benefits of a new NGV, including the "0.15 divisor" and the full-size pickup bonuses proposed in previous sections. The conversion company could then sell the credits to automakers looking to reduce their compliance costs in a given vehicle category.

Incentives for the development of the aftermarket upfit and retrofit ecosystem could also be incorporated into regulations for new vehicles, by including credits for CNG "prep packages" in the off-cycle credit program. For instance, the previously-mentioned 2016 Ford F-150 pickup has a CNG "prep package" including hardened valves, valve seats, pistons and piston rings, which significantly reduces the future cost of upfitting/retrofitting the vehicle for CNG operation.[46] Since this feature increases the likelihood that vehicles will be converted to a low-emission, non-petroleum fuel, it should be included on the off-cycle credit menu.

We encourage the agencies to consider these and other creative solutions to incorporate retrofits and aftermarket upfits into the rules. Doing so would help to counter the environmental and petroleum consumption impacts of increasing vehicle life, encourage closer collaboration between automakers and conversion companies, and improve the rules' cost-effectiveness.

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[43] Jay F. Marks, *CNG vehicle conversion business is booming for Oklahoma company*, THE OKLAHOMAN (Mar. 16, 2012), http://newsok.com/article/3658028.
[44] Clifford Krauss, *Surge in Natural Gas Has Utah Driving Cheaply*, N.Y. TIMES (Aug. 29, 2008), http://www.nytimes.com/2008/08/30/business/30gascars.html.
[45] *Certification and Compliance for Vehicles and Engines*, ENVIRONMENTAL PROTECTION AGENCY, https://www3.epa.gov/otaq/consumer/fuels/altfuels/altfuels.htm.
[46] *First Compressed Natural Gas and Propane-Capable 2016 Ford F-150 Rolls Off The Line At Kansas City*, FORD MOTOR CO. (Dec. 9, 2015), https://media.ford.com/content/fordmedia/fna/us/en/news/2015/12/09/first-compressed-natural-gas-and-propane-capable-2016-ford-f-150.html.

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Summary and Recommendations

NGVs offer a unique, proven pathway to reducing the emissions and petroleum consumption of the existing vehicle fleet, which is likely to be a growing issue as vehicle lifespans continue to be extended. Accordingly, the existing ecosystem of NGV conversion companies (as exemplified by states like Oklahoma and Utah) as well as OEMs should benefit from regulatory incentives for serving this important potential market.

- Allow EPA-certified converters to "opt in" to the program and generate credits for CNG retrofits and upfits that can subsequently be sold to automakers.

- Provide emission credits for CNG "prep packages" that reduce the costs of subsequent conversion to natural gas, as part of the off-cycle credit technologies listed at 40 C.F.R. § 86.1869–12, *CO_2 credits for off-cycle CO_2-reducing technologies.*

Addressing the Threat of Petroleum Dependence

Issues Addressed:

- *The cost on the producers or purchasers of new motor vehicles or new motor vehicle engines*
- *The impact of the standards on consumer behavior, including but not limited to consumer purchasing behavior and consumer automobile usage behavior (e.g. impacts on rebound, fleet turnover, consumer welfare effects, etc.)*
- *The impact of the standards on the automobile industry*

While EPA's emission regulations under the Clean Air Act serve an important purpose, they currently overshadow the original reason that Congress created the CAFE program in 1975: to reduce America's dependence on the petroleum fuels. The Energy Policy and Conservation Act was a direct response by lawmakers to the catastrophic economic and geopolitical effects of the 1973 oil crisis, but this purpose should also be fresh in the minds of today's policymakers and regulators. Like virtually every other economic recession, the oil price spike of 2007 is widely regarded as triggering the Great Recession in 2008, which devastated the global economy and cost over a hundred thousand jobs in the automotive sector as Chrysler and GM went into bankruptcy.[47]

Much more recently, Hurricane Harvey's devastation seriously disrupted the nation's gasoline fuel supplies[48] – a reminder (along with Superstorm Sandy in 2012[49]) that our dependency on one fuel source poses inherent risks beyond political or economic events.

[47] James Hamilton, "Oil Prices and the Economic Downturn." Testimony Prepared for the Joint Economic Committee of the U.S. Congress (May 20, 2009), https://www.jec.senate.gov/public/_cache/files/a6fca8ca-4c4f-4006-bca5-67e972dc19e2/hamilton-testimony.pdf

[48] Gaurav Sharma, *Hurricane Harvey Has Morphed Into A Major U.S. Gasoline Supply Disruption Event*, FORBES (August 28, 2017), https://www.forbes.com/sites/gauravsharma/2017/08/28/hurricane-harvey-has-morphed-into-a-major-u-s-gasoline-supply-disruption-event/#319555b72872

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The U.S. shale oil boom of recent years, while welcome, does not change this near-total dependence on petroleum fuels, nor the associated vulnerabilities. Despite increased production and exports, we still import nearly half of the oil consumed in this country.[50] Moreover, regardless of the degree of oil imports, the TAR acknowledges that "the price impacts of an oil disruption anywhere will continue to be transmitted to U.S. markets"[51] because oil is a global commodity. And Middle East and North African countries – which have triggered 8 of the 10 oil price shocks in history, and face significant threats from the rise of ISIS and Saudi/Iranian tensions – still account for 30% of global production, a share that the TAR expects to rise.[52]

Despite this ever-present danger hanging over our country, and despite the original intent of the CAFE rules, the TAR chapter on energy security acknowledges that the present regulations will barely make a dent in this dependence. In 2025, the TAR projects that U.S. oil imports will be reduced by 169,000 barrels a day thanks to the rules – less than 6% of imports, which will continue to *rise*, not fall. And with sales of EVs and FCVs projected to be less than 2% of the total market as late as 2030[53] - and NGV sales not projected at all – there is no expectation for alternative fuels to break oil's stranglehold on the transportation sector.

This does not have to be the case. As discussed in previous sections, NGVs are a proven, feasible solution for petroleum-free transportation, with 22 million on the road worldwide and currently-untapped potential for mass-market adoption here in America. In terms of a resource base, the shale gas revolution has created an enormous supply of domestic fossil natural gas supplies, and potential sources of RNG are found in communities and farms across the country. With this combination of a market-ready technology and an abundant, cleaner fuel supply, there is no reason for regulators to give up and resign the country to an oil-dependent future.

This is why restoring the "0.15 divisor" calculation for NGV emissions and removing other unreasonable restrictions on NGV incentives, as discussed earlier in these comments, is so important: not only is it justified based on the game-changing environmental benefits of RNG, but it also returns the joint EPA/NHTSA program to Congress's original purpose in passing the Energy Policy and Conservation Act as well as the Alternative Motor Fuels Act. By effectively removing Congress's CAFE incentives for NGVs, the current EPA rules create a conflict between environmental progress and America's energy security that does not need to exist.

Summary and Recommendations

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[49] Kate Zernike, *Gasoline Runs Short, Adding Woes to Storm Recovery,* N.Y. TIMES (Nov 1, 2012) http://www.nytimes.com/2012/11/02/nyregion/gasoline-shortages-disrupting-recovery-from-hurricane.html?pagewanted=all

[50] *How much petroleum does the United States import and export?* ENERGY INFORMATION ADMINISTRATION (April 4, 2017). https://www.eia.gov/tools/faqs/faq.php?id=727&t=6

[51] Draft TAR, 10-22

[52] *Id.*

[53] *Id.,* 13-64

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The current rules fail to meaningfully address the massive risks to America's economic prosperity and security posed by our near-total dependence on petroleum fuels in transportation. NGVs have unsurpassed potential to provide a practical solution to this dependence, but the current EPA rules effectively undercut the original Congressional intent of the CAFE program and later Congressional incentives for NGVs by eliminating the "0.15 divisor" from emission calculations.

- The potential for NGVs to provide a mass-market solution for petroleum dependence is one more reason for pursuing the comprehensive agenda of reform for NGV regulations discussed in these comments – and making these reforms effective immediately.

NGV Reform Needed Today for 2017-2021 Targets

Issues Addressed:

- *Whether the light-duty vehicle greenhouse gas standards established for model year 2021 are appropriate.*

In addition to the MTE's original focus on the 2022-2025 standards, EPA has also requested comments on whether the standards for 2021 remain appropriate. As with the 2025 targets, we believe that automakers can indeed deliver these reductions in emissions as well as petroleum consumption – but only if they are provided with appropriate incentives that recognize the contributions that NGVs make to these goals.

For all of the reasons discussed in previous sections, we believe that the challenges of meeting the targets without NGVs pose a fundamental threat to the economic viability of U.S. automakers, and thus to the hundreds of thousands of jobs that they support. And, while this challenge is likely to become dire by 2025, it is likely that it will begin impacting automakers sooner, and potentially within the 2017-2021 timeframe. Moreover, automakers will need time to ramp up their production of NGVs, and infrastructure developers like VNG will similarly need time to build fueling networks to serve the light-duty market.

Thus, EPA's desire to review the 2021 targets is an excellent opportunity to make the recommended reforms to NGV incentives sooner, rather than waiting until 2022-2025. By reforming NGV incentives effective immediately, the industry will have the regulatory certainty needed to make these long-term investments and get to work right away. Given the importance of reducing the risks of petroleum dependence to our environment and the economy, there is simply no reason to wait.

Summary and Recommendations

Because the current disparity between the treatment of NGVs and EVs is so clearly arbitrary and contrary to real-world lifecycle GHG emissions, and because automakers need this compliance flexibility and regulatory certainty in order to confidently invest in NGV production, a reform of NGV incentives should be made effective immediately – without waiting for the 2022-

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2025 period. EPA's review of the 2021 targets as part of this proceeding is an opportunity to do so.

- In the process of reviewing the 2021 targets, the agencies should adopt the recommended changes to NGV incentives discussed in these comments effective immediately.

Conclusion and Summary of Recommendations

Discussions of the future of automotive emissions are too often characterized by pessimism from all sides. On one hand, environmentalists have pushed for a widespread adoption of EVs that the EPA's own projections (e.g. the TAR) show is decades away, with very limited penetration projected through 2025. On the other hand, the auto industry argues that it has no way to keep consumers from buying larger and more-polluting vehicles, nor any way to cost-effectively reduce their emissions. And those hoping for an end to the U.S.'s decades-long vulnerability to shocks from global oil markets have little hope at all.

This picture is so gloomy because NGVs are wrongly absent from the conversation. Proven, practical NGV technology and RNG fuel can benefit light truck drivers and the environment in the near term at competitive costs, and next-generation NGVs - with high-octane engines fueled by both RNG and hydrogen-enriched gas - have the potential to dramatically improve the trajectory of these vehicles for decades to come. And with America's unrivaled gas resources, NGVs also have the potential to finally break our near-total dependence on petroleum-based fuels with an affordable, cleaner, domestically-abundant fuel.

The MTE is a critical opportunity for the agencies to correct this glaring oversight. By seriously studying the promise of NGVs and by including a robust suite of incentives for their deployment comparable to those provided to EVs, the agencies can offer a compromise to please all sides. The existing targets for 2025 can be maintained as environmentalists wish; automakers can have an expanded set of compliance pathways that address their area of biggest need - light trucks and full-size pickups; and individual consumers get the vehicles they want and need while reducing petroleum dependence and environmental impacts at a reasonable cost.

In doing so, the agencies can deliver a win-win-win for America in line with the "pro-environment, pro-growth" philosophy espoused by this Administration.[54] VNG looks forward to working with the agencies as the MTE process continues to create a final rule that reduces emissions and petroleum dependence while boosting the domestic economy through maximizing our country's unsurpassed traditional fossil and renewable natural gas resources.

[54] *EPA chief: Trump's energy order sends 'pro-growth, pro-environment message'*, Fox News (Mar. 29, 2017), http://www.foxnews.com/politics/2017/03/29/epa-chief-trumps-energy-order-sends-pro-growth-pro-environment-message.html.

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As a final summary, we recommend the following changes to the rules:

- NGV emissions calculations should return to the "0.15" divisor effective immediately, with emissions calculated as 85% below a gasoline vehicle. This is both justified by the real-world emissions benefits of RNG and is consistent with the CAFE program. The potential for future improvements to NGV emissions from advanced engine technologies, as well as synergies with hydrogen FCVs, provides further justification for this incentive.
    - We recommend reinstating language from the MY 2011-2016 regulations under 40 C.F.R. § 600.510–12, *Calculation of average fuel economy and average carbon-related exhaust emissions*: "For natural gas-fueled model types . . . the carbon-related exhaust emissions value calculated for that model type in accordance with paragraph (b)(2) of this section multiplied by 0.15 and rounded to the nearest gram per mile, except that manufacturers complying with the fleet averaging option for N_2O and CH_4 as allowed under § 86.1818 of this chapter must perform this calculation such that N_2O and CH_4 values are not multiplied by 0.15."
- Offer a "Natural Gas Pickup" incentive similar to current hybrid-electric and "performance-based" pickup credits; however, for the natural gas pickup credit, minimum deployment thresholds should be eliminated to reflect the greater market challenges faced by NGVs - since, unlike hybrid-electrics, they use an alternative fuel.
    - This goal could be accomplished by inserting a new section (c) under 40 C.F.R. § 86.1870–12, *CO_2 credits for qualifying full-size pickup trucks*, titled "Credits for implementation of natural gas technology." The structure of these credits would be similar to those for sections (a) and (b), but with reduced or eliminated requirements for the "required minimum percent of full size pickup trucks."
- Remove the utility factor requirements for a 2:1 ratio of CNG-to-gasoline range, as well as the requirement for dual-fuel NGVs to only use gasoline when the CNG tank is empty.
    - This could be achieved by deleting the requirements in 40 C.F.R. § 600.510–12, *Calculation of average fuel economy and average carbon-related exhaust emissions*, part (c)(2)(vii)(B) for fuel economy and (j)(2)(vii)(B) for emissions.
- Incorporate the potential for use of natural gas when setting targets for practical, achievable emissions improvements for light trucks and full-size pickups. Modeling used to set achievable emissions curves for pickups and light trucks should include natural

gas as a proven technology at costs based on high-volume adoption, not their current incremental costs at low production volumes.

- Allow EPA-certified converters to "opt in" to the program and generate credits for CNG retrofits and upfits that can subsequently be sold to automakers.

- Provide emission credits for CNG "prep packages" that reduce the costs of subsequent conversion to natural gas, as part of the off-cycle credit technologies listed at 40 C.F.R. § 86.1869–12, *CO_2 credits for off-cycle CO_2-reducing technologies.*

Respectfully submitted,

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Message

From: Alice Henderson [ahenderson@edf.org]
Sent: 6/6/2017 3:15:30 PM
To: Pruitt, Scott [Pruitt.Scott@epa.gov]; A-AND-R-DOCKET [A-AND-R-DOCKET@epa.gov]; elaine.chao@dot.gov
CC: Vera Pardee [vpardee@biologicaldiversity.org]; Andrew Linhardt [andrew.linhardt@sierraclub.org]
Subject: Letter Opposing Reopening Midterm Evaluation of GHG Standards for Light Duty Vehicles
Attachments: LD MTE NOI Letter 6.6.17.pdf

Administrator Pruitt and Secretary Chao:

Attached please find a letter from Environmental Defense Fund, Center for Biological Diversity, and Sierra Club opposing your decision to reopen the midterm evaluation of greenhouse gas emissions standards for model year 2022–2025 light duty vehicles.

The robust technical record clearly establishes that these standards can be achieved at even lower costs and with greater benefits than the agencies originally estimated. And the forward-looking statutory frameworks under which the light duty standards are promulgated, coupled with the compelling evidence in and since the technical record demonstrating that the standards are appropriate, require that EPA, at a minimum, affirm the standards for MY 2022 through 2025 if it were to reconsider them.

On behalf of our millions of members across the country, we strongly urge you to withdraw the Notice of Intention to Reconsider the Final Determination of the Mid-Term Evaluation.

Best regards,
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June 6, 2017

The Honorable Scott Pruitt
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

The Honorable Elaine L. Chao
Secretary
U.S. Department of Transportation
1200 New Jersey Ave, SE
Washington, DC 20590

Re.: Request to Withdraw *Notice of Intention to Reconsider the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light Duty Vehicles*, 82 Fed. Reg. 14671, (Mar. 22, 2017)

Dear Administrator Pruitt and Secretary Chao:

On behalf of our millions of members across the country, we strongly urge EPA to withdraw its Notice of Intention to Reconsider the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emission Standards for Model Year 2022-2025 Light Duty Vehicles (NOI)[1] and reaffirm the Final Determination.[2]

As its rationale for reopening the mid-term evaluation (MTE), EPA indicated that "it is appropriate to reconsider its Final Determination in order to allow additional consultation and coordination with NHTSA."[3] In other public statements, agency and administration officials have indicated that a focus on economic health and job creation has motivated the decision to reopen the review of the standards.[4] The agencies' NOI also comes amidst a broader review,

[1] Notice of Intention to Reconsider the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light Duty Vehicles, 82 Fed. Reg. 14671, (Mar. 22, 2017).
[2] Final Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation (January 2017), Doc. ID: EPA-420-R-17-001, *available at* https://www.regulations.gov/document?D=EPA-HQ-OAR-2015-0827-6270.
[3] 82 Fed. Reg. at 14672.
[4] *See, e.g.*, remarks of President Trump, American Center for Mobility (March 15, 2017), *available at* https://www.washingtonpost.com/video/politics/president-trumps-full-speech-in-ypsilanti-mich/2017/03/15/86765dd2-09b3-11e7-bd19-fd3afa0f7e2a_video.html (suggesting a review is necessary to determine "[i]f the standards threaten auto jobs").

initiated by the President, designed to identify and repeal health and environmental protections that are deemed to impact domestic fossil fuel production. This NOI and statements surrounding it are deeply concerning because they ignore the successful track record of fuel economy and greenhouse gas standards (and indeed the Clean Air Act more broadly)—one in which health protection, consumer savings and job creation have gone hand in hand. Equally concerning, the review fundamentally misapprehends EPA's proper role, statutory mandate, and expertise—not as an economic development authority, but instead as the agency with core responsibility for protecting the health of all Americans.

The decision to re-open the MTE based on these considerations is accordingly without merit and should be withdrawn. In light of the robust technical record and other data supporting the Final Determination, as well the agencies' statutory responsibilities to protect human health and enhance energy efficiency of motor vehicles, the adoption of any standards less stringent than the current standards would be arbitrary and unlawful.[5] Indeed, the extensive empirical record demonstrates that greater reductions are achievable and cost-effective, and that limiting vehicle emissions is vital for public health. Reconsideration is not warranted by the record, but if EPA is to reconsider its determination, the agency should consider strengthening the standards.

I. The Record Does Not Support EPA's Decision to Reconsider the Final Determination.

EPA, NHTSA, and the California Air Resources Board (ARB) jointly conducted a multi-year mid-term review of the MY 2022-2025 standards, amassing a robust record, including examination of technical and economic analyses, meetings with stakeholders, and consideration of hundreds of thousands of public comments. The resulting technical assessment report (TAR), on which EPA's Final Determination is based, reflects the findings and conclusions of all three agencies. And those findings are clear: the 2022-2025 standards are technically achievable and cost effective, and can be met without adverse economic impacts. Indeed, they more than pay for themselves in fuel savings alone.

The record supports a determination that the 2022-25 standards are technically achievable and cost-effective.

The Final Determination found that automakers are well positioned to meet the standards at lower costs than previously estimated and auto manufacturers and suppliers are developing and deploying fuel efficiency technologies at a much faster rate than was forecasted in the 2012 final

[5] Pursuant to the judicial review provisions of the Clean Air Act, a court reviewing EPA's GHG emission standards may reverse the action if it is found to be arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law. 42 U.S.C. § 7607. Similarly, NHTSA's CAFE standards are subject to the Administrative Procedure Act, which authorizes a reviewing court to hold unlawful an agency action found to be arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law. 5 U.S.C. § 706.

rule. Indeed, while the standards fulfill the requirements of the Clean Air Act, EPA and independent analyses conducted before and after the Final Determination was issued show these standards could be more stringent. As noted in the Final Determination, the EPA Administrator chose to "retain the current standards to provide regulatory certainty for the auto industry despite a technical record that suggests the standards could be made more stringent."[6] These conclusions were based on analyses that reflected the most current data and assessment of the feasibility of the 2025 standards.[7]

An independent analysis commissioned by the Environmental Defense Fund (EDF) of four scenarios that were 10, 20, 30, and 40 g/mi more stringent than EPA's MY2025 target (173 g/mi) confirmed EPA's conclusion.[8] The study found that the target of 30 g/mi more stringent than EPA's MY2025 target can be met cost effectively with the same advanced gasoline vehicle technology pathways projected to be utilized to meet the existing MY2025 standards. Even at 30 g/mi more stringent than EPA's target, the lifetime fuel savings alone of about $2700 would more than offset the $1579 per vehicle cost of complying with more stringent standards even without including societal monetized benefits, and even if the very low levels of strong hybrid and EV sales assumed by EPA does not accelerate.

In parallel to EPA's determination, ARB staff released California's Advanced Clean Cars Midterm Review report in January 2017 confirming that "the current national 2022 through 2025 model year GHG standards can be readily met at the same or lower cost than originally projected and manufacturers will likely continue to make progress towards even more cost-effective solutions."[9] ARB subsequently voted unanimously to affirm the standards and move forward with more protective standards for post-2025 model years.[10] ARB's action was based on

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[6] EPA, "Final Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation," (January 2017). *See* https://www.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-greenhouse-gas-ghg#final-determination ["Final Determination"]

[7] *See* EDF comments on the TAR and EPA's proposed determination for a more in-depth discussion of the technical record supporting the Final Determination. Comments by Environmental Defense Fund on the Draft Technical Assessment Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025 (September 26, 2016), Doc. ID: NHTSA-2016-0068-0066; Comments by Environmental Defense Fund on EPA's Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation (December 30, 2016), Doc. ID: EPA-HQ-OAR-2015-0827-6201.

[8] *See* Comments by Environmental Defense Fund on EPA's Proposed Determination, *supra* note 7. The analysis used the modeling tool, OMEGA, which EPA relied upon for the Proposed Determination analysis and retained the same inputs and constraints that EPA used for the primary analysis in the Proposed Determination.

[9] ARB, "California's Advanced Clean Cars Midterm Review" (January 18, 2017), *available at* https://www.arb.ca.gov/msprog/acc/mtr/acc_mtr_summaryreport.pdf.

[10] ARB, "CARB finds vehicle standards are achievable and cost-effective" (March 24, 2017), *available at* https://www.arb.ca.gov/newsrel/newsrelease.php?id=908.

comprehensive, multi-year technical assessments and analyses by ARB staff, EPA staff and independent analysts that concluded that the standards for model years 2022 through 2025 are appropriate and feasible. The staff assessment found that the technology to achieve the standards "is not only currently available, but has exceeded the original expectations, both for level of development and cost, when the standards were adopted *with automaker support* in 2012."[11]

New studies conducted since the MTE concluded continue to point in favor of more stringent standards. In the Final Determination, the Administrator concluded that, "the current record, including the current state of technology and the pace of technology development and implementation, could support a proposal, and potentially an ultimate decision, to adopt more stringent standards for MY2022-2025."[12] Numerous independent researchers have since confirmed this conclusion. For example, an analysis by the International Council on Clean Transportation (ICCT), an independent research group, has concluded that EPA's previous costs of compliance were greatly overstated and that compliance costs for 2025 standards will be 34–40 percent lower than projected by EPA.[13] The ICCT study builds on the modeling and peer-reviewed research underlying EPA's and NHTSA's TAR by including new modeling of advanced vehicle technologies that were not included in the agencies' model, but are now available. ICCT found that continuing the standards at the current pace of improvement through 2030 is feasible and cost-effective. Such standards would result in modest, gradual vehicle price increases through 2030, and those costs would be outweighed by fuel cost savings by two to three times.[14]

EDF also commissioned an independent analysis, published in February 2017, which evaluates the feasibility and cost-effectiveness of reducing CO2 emissions from passenger vehicles by up to 90 grams per mile below the current 2025 model year standards. The study found that there are a significant number of key conventional technologies that are underutilized that significantly further the CO2 reductions that can be achieved by 2030, and also that the lifetime fuel savings would exceed the increased average vehicle price by a factor of nearly three for even the most protective standard considered.[15]

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[11] *Id.* (emphasis added).
[12] Final Determination at ES-8.
[13] Lutsey, Nic, et. al. "Efficiency technology and cost assessment for U.S. 2025–2030 light-duty vehicles," (2017), *available at* http://theicct.org/US-2030-technology-cost-assessment.
[14] *Id.*
[15] Cackette, Tom and Rykowski, Rick, "Technical Assessment of CO2 Emission Reductions for Passenger Vehicles in the Post-2025 Timeframe" (February 2017), *available at* https://www.edf.org/sites/default/files/content/final_public_white_paper_post_2026_co2_reductions2.27_clean.pdf.

The record already clearly demonstrates that compliance with the standards would not result in adverse economic impacts.

The record clearly shows that the costs of the 2022-2025 standards are far outweighed by the fuel cost savings—even without considering the very significant environmental benefits. And independent studies confirm that even more stringent standards are technologically feasible and again that the fuel cost savings to the consumer would outweigh the added cost of technology.

Since the depths of the economic recession in 2008, the auto industry has returned to profitability while at the same time fleet-wide fuel economy has climbed to its highest level ever. Drivers in the United States bought more cars in 2016 than ever before.[16] At the same time, the auto industry as a whole has exceeded the national fuel economy and GHG standards in each of the last four years.[17] During its return to profitability, the auto industry also added jobs. Since the recession, overall job growth in the industry has been strong, aiding a recovery of U.S. manufacturing as a whole. The U.S. auto industry has added nearly 700,000 direct jobs since mid-2009 – and these jobs support several million indirect jobs throughout the economy.[18] The Manufacturers of Emission Controls Association estimates that its member companies account for over 70,000 jobs across America in 2016 manufacturing emission control and efficiency technologies.[19] Even a recent methodologically flawed,[20] industry-commissioned report by the Center for Automotive Research (CAR)[21] assessing sales and employment impacts of the 2016-

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[16] Los Angeles Times, "2016 U.S. auto sales set a new record high, led by SUVs" (January 4, 2017), http://www.latimes.com/business/autos/la-fi-hy-auto-sales-20170104-story.html (last accessed May 9, 2017).

[17] EPA, "Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends Report 1975-2016," (2016), *available at* https://www3.epa.gov/otaq/fetrends-complete.htm.

[18] BlueGreen Alliance, "Backgrounder: Sound Vehicle Standards & Policies Drive Strong Job Growth, *A summary of research and analysis of the impact of CAFE standards on job growth in the United States*." (June 2016), https://www.bluegreenalliance.org/resources/sound-vehicle-standards-policies-drive-strong-job-growth/ (last accessed March 10, 2017).

[19] MECA Highlights American Jobs, Economic Contribution of Mobile Source Emission Control and Efficiency Technology Industry, http://www.meca.org/attachments/2930/MECA_American_jobs_press_release_033017.pdf (last accessed May 9, 2017).

[20] The report's flaws have been well documented. *See* EPA, Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation, Technical Support Document, Chapter 4.2.1, Doc. ID: EPA-HQ-OAR-2015-0827-5941; Aaron Isenstadt, *The latest paper by the Center for Automotive Research is not what it thinks it is*, The International Council on Clean Transportation, October 12, 2016, http://www.theicct.org/blogs/staff/latest-paper-by-CAR-is-not-what-it-thinks-it-is, Doc. ID: ; Supplemental Comments by Environmental Defense Fund on EPA's Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation (January 11, 2017), Doc. ID: EPA-HQ-OAR-2015-0827-6272.

[21] Center for Automotive Research, "The Potential Effects of the 2017-2025 EPA/NHTSA GHG/Fuel Economy Mandates on the U.S. Economy" (September 2016), *available at* http://www.cargroup.org/publication/the-potential-effects-of-the-2017-2025-epanhtsa-ghgfuel-economy-mandates-on-the-u-s-economy/.

2025 standards shows positive sales and an increase in jobs when its methodology is used with EPA's assumptions for costs and consumer purchasing decisions.[22] For example, EPA estimates that consumers consider five years of fuel savings, rather than CAR's assumed three years, when purchasing a vehicle.[23] There is no indication that continuing compliance with the standards will result in adverse economic impacts on the industry.

Automakers have confirmed their commitments to developing and deploying transformative fuel efficiency technologies—decisions grounded both in a desire to meet future standards and in a recognition of the important market opportunity that these vehicles of the future represent. In a 2016 SEC filing, General Motors stated: "We are investing significantly in multiple technologies offering increasing levels of vehicle electrification including eAssist, plug-in hybrid, full hybrid, extended-range and battery electric vehicles … We are fully committed to improving fuel efficiency and meeting regulatory standards."[24] And Ford Motor Company's former CEO, Mark Field, stated earlier this year: "As more and more consumers around the world become interested in electrified vehicles, Ford is committed to being a leader in providing consumers with a broad range of electrified vehicles, services and solutions that make people's lives better. Our investments and expanding lineup reflect our view that global offerings of electrified vehicles will exceed gasoline-powered vehicles within the next 15 years."[25]

Even if the record showed an adverse economic effect on the industry—which, as demonstrated above, it does not—the Clean Air Act would not allow EPA to elevate economic concerns above all others. Contrary to the statute, a narrow focus on economic effects appears to be the motivating factor behind the withdrawal. President Trump's executive orders,[26] the public comments of senior Administration officials,[27] and the NOI reopening the MTE indicate that the agency is focused exclusively on economic considerations, including factors that fall outside of

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[22] *See* Charmley, B., "EPA GHG Update for 2017 Fuel Economy Detroit" at 26 (March 16, 2017), *available at* https://www.epa.gov/sites/production/files/2017-03/documents/fuel-economy-detroit-2017-03-16.pdf (showing a net sales increase of 585,000 vehicles and national employment growth of 206,000 jobs).

[23] *Id.*

[24] General Motors Company, Form 10-K, *available at* https://www.sec.gov/Archives/edgar/data/1467858/000146785816000255/gm201510k.htm.

[25] Electrek, "Ford says electric vehicles will overtake gas in 15 years, announces all-electric 300-mile SUV, hybrid F-150, Mustang, and more," https://electrek.co/2017/01/03/ford-new-electric-cars/ (last visited May 9, 2017).

[26] *See, e.g.*, Exec. Order No. 13,783, 82 Fed. Reg. 16,093 (March 31, 2017); Exec. Order No. 13,777, 82 Fed. Reg. 12,285 (March 1, 2017).

[27] *See, e.g.*, Comments of Administrator Pruitt, *Trump to Sign New Order Rolling Back Obama Energy Regs*, Fox & Friends (Mar. 28, 2017), http://www.foxnews.com/politics/2017/03/28/trump-set-to-undo-obamas-action-against-global-warming.html. *See also* comments of a senior White House official, *Background Briefing on the President's Energy Independence Executive Order* (Mar. 27, 2017), https://www.whitehouse.gov/the-press-office/2017/03/27/background-briefing-presidents-energy-independence-executive-order.

the scope of the Clean Air Act. While EPA considers cost as one of several factors in setting vehicle standards, the NOI ignores the predominant purpose of section 202 of the Act: protecting the public from health-harming vehicle emissions. The Agency simply may not elevate costs above the predominant purpose of the statute.[28]

II. EPA and NHTSA Must Meet Their Respective Substantive Responsibilities under the Clean Air Act and the Energy Policy and Conservation Act (EPCA).

The CAA requires the EPA to regulate motor vehicle emissions which "cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare."[29] Both the "may reasonably be anticipated" and "endanger" language reflect Congress' intent for EPA to act in a manner that prevents, rather than merely responds to, harm.[30] Similarly, Congress intended EPCA's fuel efficiency standards "to provide for improved energy efficiency of motor vehicles" in support of the Act's goal of reducing the demand for energy.[31] In establishing and administering standards for light-duty vehicles, EPA and NHTSA both operate under ambitious and forward-looking statutory frameworks. The agencies' authorizing statutes for the light-duty program contemplate the establishment of standards based on a consideration of advanced and emerging technologies.

Because of the important public health purpose and preventative nature of the CAA's mandate, EPA's authority to establish standards under it is far-reaching. CAA Section 202 standards take effect "after such period as the Administrator finds necessary to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period."[32] As the nation's highest court has recognized, the legislative history of the CAA underscores that Congress did not intend for EPA to be "limited by what is or appears to be technologically or economically feasible, but to establish what the public interest requires to protect the health of persons, even if that means that '*industries will be asked to do what seems to be impossible at the present time*.'"[33] In directing that EPA set standards for future

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[28] *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172 (9th Cir. 2008).
[29] 42 U.S.C. § 7521(a)(1).
[30] *See Ethyl Corp. v. EPA*, 541 F.2d 1, 12 (D.C. Cir. 1976) ("endangers means something less than actual harm. When one is endangered, harm is threatened; no actual injury need ever occur").
[31] 42 U.S.C. § 6201(5), *see also* § 6201(1).
32 42 U.S.C. § 7521(a)(2).
[33] *Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 490-91 (2001) (quoting 116 Cong. Rec. 32901-32902 (1970), 1 *Legislative History of the Clean Air Amendments of 1970* (Committee Report compiled for the Senate Committee on Public Works by the Library of Congress), Ser. No. 93-18, p. 227 (1974)(emphasis in original). *See also Natural Res. Def. Council, Inc. v. EPA*, 655 F.2d 318 (D.C. Cir. 1981) (upholding EPA's 1980 PM standards for light-duty diesel vehicles, and noting, "[t]he legislative history of both the 1970 and the 1977 amendments demonstrates that Congress intended the agency to project future advances in pollution control capability," and "[i]t was expected to press for the development and application of improved technology rather than be limited by that which exists today." (internal quotations and citations omitted).

dates that the agency determines will provide the appropriate length of time for the development of requisite technologies, Congress intended that EPA "press for the development and application of improved technology rather than be limited by that which exists today."[34] And when EPA has acted in accordance with its authority, standards have driven profound innovation to secure life-saving pollution reductions and have been cost-effective even without counting, as EPA must, these benefits. For instance, EPA standards under section 202 resulted in the development and proliferation of the catalytic converter in 1975 and the three-way catalyst in 1981.[35] Particulate standards for heavy-duty vehicles also resulted in the development of the diesel particulate filter.[36]

Likewise, under the Energy Conservation and Policy Act (EPCA) as amended by the Energy Independence and Security Act of 2007 (EISA), NHTSA's fuel economy standards must represent "the maximum feasible average fuel economy level that the Secretary [of Transportation] decides the manufacturers can achieve in that model year."[37] In granting the agency discretion to set "maximum feasible" standards for future model years, Congress instructed NHTSA to consider "technological feasibility, economic practicability, the effect of other motor vehicle standards of the Government on fuel economy, and the need of the United States to conserve energy."[38] It is within NHTSA's discretion to decide how to balance these factors, but the agency may not "put a thumb on the scale" to deem more stringent standards too costly.[39] Indeed, NHTSA must "monetize the value of carbon emissions" in its analysis.[40] Overall, NHTSA's weighing of relevant considerations must serve the intent of the light duty program; the agency's analysis may not "undermine the fundamental purpose of the EPCA: energy conservation."[41]

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[34] *Natural Res. Def. Council, Inc. v. EPA*, 655 F.2d 318, 328 (D.C. Cir. 1981) (citing S. Rep. No.1196, 91st Cong., 2d Sess. 24 (1970), reprinted in 1 Legislative History 424; H.R. Rep. No.294, 95th Cong., 1st Sess. 273 (1977), reprinted in (1977) U.S. Code Cong. & Ad. News 1077, 1352, 4 Legislative History 2740).

[35] *See, e.g.*, Gerard, David and Lave, Lester B., *Implementing technology-forcing policies: The 1970 Clean Air Act Amendments and the introduction of advanced automotive emissions controls in the United States*, 72 Technological Forecasting and Social Change 761 (2005), *available at* http://repository.cmu.edu/tepper/1356/.

[36] *See, e.g.*, Wold, Chris, *Climate Change, Presidential Power, and Leadership: We Can't Wait*, 45 Case Western Reserve J. of Int'l Law 303, 346, *available at* http://law.case.edu/journals/jil/Documents/45CaseWResJIntlL1&2.15.Article.Wold.pdf.

[37] 49 U.S.C. § 32902(a).

[38] 49 U.S.C. § 32902(f).

[39] *Ctr. for Biological Diversity.*, 538 F.3d at 1198 ("Even if NHTSA may use a cost-benefit analysis to determine the "maximum feasible" fuel economy standard, it cannot put a thumb on the scale by undervaluing the benefits and overvaluing the costs of more stringent standards.")

[40] *Ctr. for Biological Diversity*, 538 F.3d at 1227.

[41] *Ctr. for Biological Diversity*, 538 F.3d at1195.

To satisfy their statutory mandates, the agencies must consider all of the factors relevant to the appropriateness of the standards.[42] Here, EPA's MY2022-25 standards are conservative: they relied only on highly cost-effective technologies already in existence. Conversely, a review of these standards that focuses exclusively on economic considerations, without considering the benefits of the rule and the full suite of statutorily prescribed factors—principally among them the directive to safeguard the public health and welfare—would be inappropriate and manifestly unlawful.[43]

Agencies May Reverse the Course of Regulatory Policy Only When Such Reversal is Reasonable and Supported by the Record.

Any agency reversal of position must be supported by a reasoned explanation,[44] including a "rational connection between the facts found and the choice made."[45] As the basis for reversing course, the agencies may not offer a justification "that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise."[46] Even when an agency does make new factual findings to support a new policy, if those findings contradict the prior record, the agency faces a higher burden in demonstrating that the change is reasoned.[47] An agency may not "disregard contrary or inconvenient factual determinations that it made in the past, any more than it can ignore inconvenient facts when it writes on a blank slate."[48]

Moreover, abrupt changes in course constitute "danger signals" that an agency is ignoring the will of Congress and acting inconsistently with its statutory mandate.[49] Such sudden policy shifts warrant scrutiny of the agency's reasoning for the change.[50]

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[42] *See, e.g., Engine Mfrs. Ass'n v. EPA*, 88 F.3d 1075, 1084 (D.C. Cir. 1996) ("The court will uphold the EPA's final rule if EPA acted within its delegated statutory authority, considered all of the relevant factors, and demonstrated a reasonable connection between the facts on the record and its decision.") (internal quotation omitted). *See also Motor & Equipment Mfrs. Ass'n. v. EPA*, 627 F.2d 1095, 1116 (D.C. Cir. 1979) ("the determination of what is relevant turns in the first instance on analysis of the express language of the statute involved and the content given that language by implication from the structure of the statute, its legislative history, and the general course of administrative practice since its enactment. An administrative agency has no charter apart from the framework constructed by that analysis to enforce or otherwise consider whatever suits its or someone else's fancy.")

[43] *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983)("*State Farm*") (A rule is arbitrary and capricious if the agency "has relied on factors which Congress has not intended it to consider," or "entirely failed to consider an important aspect of the problem").

[44] *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515 (2009); *State Farm*, 463 U.S. at 42.

[45] *State Farm*, 463 U.S. at 43 (citation omitted).

[46] *Id.*

[47] *FCC*, 556 U.S. at 515 (When an agency's "new policy rests upon factual findings that contradict those which underlay its prior policy," the agency must "provide a more detailed justification than what would suffice for a new policy created on a blank slate.")

[48] *Id.*

[49] *State Farm Mut. Auto. Ins. Co. v. DOT*, 680 F.2d 206, 221 (D.C. Cir. 1982).

[50] *Natural Res. Def. Council, Inc. v. EPA*, 683 F.2d 752, 760 (3d Cir. 1982).

Accordingly, EPA and NHTSA may not ignore the extensive technical record supporting the Final Determination, and the agencies must provide a reasoned explanation for any departure from those factual findings. This bar is especially high in instances where, as here, the record is extremely robust and so strongly supports, at a minimum, maintaining the agencies' current course of action.

III. Process Concerns Do Not Warrant a Reconsideration of the Final Determination.

EPA's NOI announced an intent "to coordinate its reconsideration with the parallel process to be undertaken by the DOT's NHTSA."[51] The contention—which closely tracks arguments made by auto industry groups[52]—that EPA failed to consult and coordinate with NHTSA, is inaccurate and does not provide a basis for EPA's NOI. A recent letter from Administrator Pruitt to California Governor Jerry Brown similarly mischaracterizes the procedural history of the light-duty standards that EPA, NHTSA, ARB, and stakeholders—including the auto industry—have undertaken together.[53]

EPA and NHTSA have worked together to develop these standards since the beginning of the Phase 1 rulemaking process, performing coordinated feasibility analyses to inform both the Phase 1 and Phase 2 standards, which were both overwhelmingly supported by the auto industry. Likewise, the MTE process was conceived and agreed upon by automakers, EPA, NHTSA and ARB during the development of the 2012 Phase 2 standards. The MTE was designed as an administrative reassessment of the costs and technologies that informed the 2012 rulemaking in light of current realities, to inform whether the MY2022-2025 standards remain appropriate, or warrant upward or downward revision. It was never guaranteed to result in any change to the standards as promulgated after thorough analysis in 2012. The agreed process required a draft Technical Assessment Report (TAR) jointly developed by EPA, NHTSA and ARB with opportunity for public comment, and EPA's Proposed Determination with opportunity for public comment.

As planned, the agencies jointly conducted a multi-year mid-term review, amassing a robust record, including extensive data-gathering, examination of technical and economic analyses, meetings with stakeholders, and consideration of hundreds of thousands of public comments

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[51] 82 Fed. Reg. 14671.

[52] Letter from Alliance of Automobile Manufacturers to Administrator Pruitt (February 21, 2017), *available at* https://autoalliance.org/wp-content/uploads/2017/02/Letter-to-EPA-Admin.-Pruitt-Feb.-21-2016-Signed.pdf; Letter from Global Automakers, Inc. to Administrator Pruitt (February 21, 2017), *available at* https://www.globalautomakers.org/system/files/document/attachments/2017-02-21_request_to_withdraw_final_determination.pdf.

[53] Letter from Administrator Pruitt to California Governor Jerry Brown (May 2, 2017), *available at* https://www.eenews.net/assets/2017/05/05/document_cw_01.pdf.

collected in response to the draft TAR and the proposed determination. EPA then issued its Final Determination finding that the MY2022-2025 standards are technically achievable and cost effective, and can be met without adverse economic impacts. The TAR, on which EPA's Final Determination is based, reflects the findings and conclusions of all three agencies—fully encompassing NHTSA's views as to feasibility.

Contrary to auto industry claims, the MTE was conducted over an extended period with two separate opportunities for public comment. In contrast, the NOI was issued abruptly without notice or request for public comment. It appears the NOI responds to auto industry association letters submitted in late February, requesting a reopening of the review;[54] there is no record of EPA consultation with any other stakeholders. If undertaken, the proceeding that the NOI initiates will require proper process and transparency, including notice to interested parties, and opportunity for input and participation.[55]

IV. The Final Determination—Preserving the MY 2022-2025 Standards—Is a Critical Step in the Path toward Energy Efficiency and Healthy, Clean Air.

The light-duty greenhouse gas and fuel economy standards are on the path to significantly curbing CO2 emissions from the transportation sector. However, despite these reductions, and in part due to increased vehicle-miles of travel (VMT), total emissions from the sector continue to increase. Transportation surpassed the power sector in CO2 emissions for the first time in 2016.[56] In fact, the U.S. transportation sector was the only sector with increased CO2 emissions in 2016.

Cars and light trucks emit many other harmful pollutants, and their emissions contribute significantly to air pollution around roads – major roadways and surrounding neighborhoods typically have elevated concentrations of harmful pollutants. Roadside exposure is a pervasive problem affecting millions of people in the United States: more than 50 million U.S. residents live, work, or attend school near high-traffic roadways, and the average American travels along roads for over an hour a day.[57] The risks are particularly high for minorities and persons of lower socioeconomic status, because these groups constitute a higher percentage of the

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[54] *See supra* note 47.

[55] Moreover, NHTSA will be subject to National Environmental Policy Act (NEPA) requirements if its forthcoming de novo rulemaking alters the standards proposed in the 2012 rulemaking in any way. Pursuant to NEPA, when NHTSA begins a rulemaking process, and is determining the level at which to set fuel efficiency standards, it must incorporate into its analysis a comparison of the potential environmental impacts of the proposed action to those of a reasonable range of alternatives. If a new environmental analysis is required, the Agency must fulfill its legal obligation to do a thorough and transparent job of estimating the full suite of social and environmental benefits, both monetized and non-monetized, of the proposed alternatives.

[56] EIA, Today In Energy, https://www.eia.gov/todayinenergy/detail.php?id=30712&src=email (last visited May 9, 2017).

[57] 78 Fed. Reg. at 29,819, 29,837.

population near major roadways.[58] Moreover, a recent investigation determined that almost 8,000 U.S. public schools, serving about 4.4 million students across every state in the country—as well as thousands more private schools and Head Start centers—are within 500 feet of highways, truck routes and other roadways with heavy traffic,[59] where health-harming pollutants from vehicle exhaust are at the highest levels.[60] The American Lung Association's 2017 State of the Air report found that even with continued improvement, more than 125 million people in the United States live where the air is unhealthy for them to breathe.[61]

The agencies estimate that the light-duty standards will eliminate six billion metric tons of carbon pollution over the life of the vehicles subject to the standards,[62] which is more than a year's worth of U.S. carbon emissions.[63] Without the standards, emissions from the sector would rise considerably. The standards will enhance our nation's energy security by reducing oil consumption by two million barrels per day by 2025 – more than we import from any country other than Canada.[64] As these more efficient vehicles become a greater percentage of the nation's fleet, oil savings will grow and ultimately reach over 4 million barrels per day–more than we import from all OPEC countries combined.[65] Over the lifetime of the program, these savings amount to over 12 billion barrels of oil, enhancing American energy independence.

Reconsideration is not warranted by the record, but if EPA is to reconsider its determination, the agency should strengthen the standards. The extensive empirical record demonstrates that greater reductions are achievable and cost-effective, even without monetizing the crucial health and environmental benefits. While carcinogenic and climate-destabilizing pollutants continue to imperil public health and welfare, any weakening of the standards or delay of compliance timeframes would be fundamentally contrary to the agencies' duties to fulfill their statutory mandates.

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[58] 78 Fed. Reg. at 29,837.

[59] The Center for Public Integrity, "The invisible hazard afflicting thousands of schools" (February 17, 2017), *available at* https://www.publicintegrity.org/2017/02/17/20716/invisible-hazard-afflicting-thousands-schools.

[60] EPA, Best Practices for Reducing Near-Road Pollution Exposure at Schools (November 2015), *available at* https://www.epa.gov/sites/production/files/2015-10/documents/ochp_2015_near_road_pollution_booklet_v16_508.pdf.

[61] American Lung Association, "State of the Air 2017," (2017), available at http://www.lung.org/assets/documents/healthy-air/state-of-the-air/state-of-the-air-2017.pdf.

[62] Driving Efficiency: Cutting Costs for Families at the Pump and Slashing Dependence on Oil, https://obamawhitehouse.archives.gov/sites/default/files/fuel_economy_report.pdf.

[63] EIA, U.S. Energy-Related Carbon Dioxide Emissions, 2015, http://www.eia.gov/environment/emissions/carbon/ (last visited May 9, 2017).

[64] EPA and NHTSA Set Standards to Reduce Greenhouse Gases and Improve Fuel Economy for Model Years 2017-2025 Cars and Light Trucks, *available at* https://nepis.epa.gov/Exe/ZyPDF.cgi/P100EZ7C.PDF?Dockey=P100EZ7C.PDF.

[65] EIA, Frequently Asked Questions, https://www.eia.gov/tools/faqs/faq.php?id=727&t=6 (last visited May 9, 2017).

V. Conclusion.

We strongly urge EPA to withdraw its NOI to reconsider the MY 2022-25 standards. The NOI is not supported by the evidence in the factual record. The findings in the joint TAR document clearly establish that the Phase 2 standards can be achieved at even lower costs and with greater benefits than the agencies originally estimated. The forward-looking statutory frameworks under which the light duty standards are promulgated, coupled with the compelling evidence in and since the technical record demonstrating that the standards are appropriate, require that EPA, at a minimum, affirm the Phase 2 standards for MY 2022 through 2025 if it were to reconsider them. Indeed, anything less would be arbitrary and unlawful.

Respectfully submitted,

Alice Henderson
Attorney
Environmental Defense Fund

Vera Pardee
Senior Counsel
Center for Biological Diversity

Andrew Linhardt
Associate Director for Federal Advocacy
Sierra Club

Message

From: Environmental Defense Fund [takeaction@edf.org]
on behalf of Beth Wright [takeaction@edf.org]
Sent: 4/3/2018 4:41:51 AM
To: Pruitt, Scott [Pruitt.Scott@epa.gov]
Subject: Rolling back Clean Car Standards is bad for America.

Apr 2, 2018

Administrator E. Scott Pruitt

Dear Administrator Pruitt,

I am writing today in strong opposition to the Trump Administration's decision to attack America's Clean Car Standards.

These pollution control standards are a win-win: they're protecting us from climate change while saving Americans money at the pump. Unraveling these standards would unnecessarily waste Americans' hard-earned money.

To remain competitive in a global market increasingly dominated by China, America must invest in cleaner-running cars. China is the top market for electric vehicles with hundreds of thousands of such cars on the road, and reported a 70-percent increase in sales of EVs in 2016. Canada, France, and Sweden have all seen remarkable increases as well. If we want to be able to export American-made cars to China or France a few years from now, these standards need to remain in place, especially since the rest of the world is still committed to Paris Accords.

Last year, the EPA concluded an exhaustive technical review of the industry's ability to meet the phase of the standards covering 2022-2025 model years, and found industry can meet those standards at lower costs than initially predicted.

And, quite honestly, I have heard Republican administrations, Republicans in Congress, and the U.S. auto industry crying wolf about fuel economy standards ever since the Reagan Administration refused to renew the CAFE standards established during the Carter Administration after the OPEC oil embargo in an effort to make us less dependent on foreign oil and to prevent a repetition of the inflationary disaster that caused for our economy. I saw what happened as a result of that inaction: it was quite clear that Detroit lost a significant portion of its market share to Japan which was producing more fuel efficient vehicles, resulting in the loss of millions of jobs in the American auto industry.

Don't unravel our recent progress in this regard. I ask you to keep these crucial standards in place for the benefit of our planet and of all Americans.

Sincerely,

Ms. Beth Wright
239 8th St
Apalachicola, FL 32320-1389
(123) 456-7890
birdgirl7576@gmail.com

Message

From: Environmental Defense Fund [takeaction@edf.org]
on behalf of Constance Voget [takeaction@edf.org]
Sent: 8/26/2017 4:05:26 AM
To: Pruitt, Scott [Pruitt.Scott@epa.gov]
Subject: Do not weaken or remove our Clean Cars Standards

Aug 25, 2017

Administrator E. Scott Pruitt

Dear Administrator Pruitt,

I do not support the EPA and DOT's reconsideration of greenhouse gas pollution standards for cars and passenger trucks for model years 2022 to 2025. A reconsideration is unjustified in view of the rigor with which the existing midterm evaluation and recommendations for model years 2022 to 2025 were executed. A reconsideration represents a waste of agency resources and taxpayers' money. A reconsideration brings uncertainty and increased costs for manufacturers and other industries relying on standards.

The clean fuels standards create numerous benefits: strengthening U.S. energy security, saving consumers money at the gas pump, and keeping American car manufacturers and workers competitive. They ensure that people who buy a new car or truck in 2025 would, in total, save more than $1 trillion in fuel costs. They would reduce America's oil consumption by two million barrels per day by 2025--more than we import from any single country other than Canada. And the standards would eliminate more than a year's worth of U.S. carbon emissions over the life of the program.

Auto manufacturers and suppliers are already developing and deploying fuel efficient technologies at a much faster rate, and at a much lower cost, than was forecast in 2012. In fact, as a whole, the auto industry has exceeded the Clean Cars Standards in each of the last four years. Analysis indicates that industry could readily meet even higher standards

Americans want and deserve the clean fuels standards that are now needlessly being put at risk.

Sincerely,

Ms. Constance Voget
1615 N 41st St
Seattle, WA 98103-8211
(123) 456-7890
cvoget@w-link.net

Message

From: Environmental Defense Fund [takeaction@edf.org]
on behalf of FD Barth [takeaction@edf.org]
Sent: 8/18/2017 11:27:03 AM
To: Pruitt, Scott [Pruitt.Scott@epa.gov]
Subject: Do not weaken or remove our Clean Cars Standards

Aug 18, 2017

Administrator E. Scott Pruitt

Dear Administrator Pruitt,

I am writing today in strong opposition to the EPA and DOT's reconsideration of greenhouse gas pollution standards for cars and passenger trucks for model years 2022 to 2025. Weakening or revoking these Clean Cars Standards will create uncertainty, slow innovation, and hurt U.S. economic leadership.

These standards strengthen U.S. energy security, save families money at the gas pump, and keep American car manufacturers and workers competitive. They ensure that people who buy a new car or truck in 2025 would, in total, save more than $1 trillion in fuel costs. They would reduce America's oil consumption by two million barrels per day by 2025--more than we import from any single country other than Canada. And it would eliminate more than a year's worth of U.S. carbon emissions over the life of the program.

Auto manufacturers and suppliers are already developing and deploying fuel efficient technologies at a much faster rate, and at a much lower cost, than was forecast in 2012. In fact, as a whole, the auto industry has exceeded the Clean Cars Standards in each of the last four years.

Americans deserve a healthier, safer, and cleaner future. These standards put us well on that path. Do not throw them into reverse.

Sincerely,

Ms. FD Barth
200 W 86th St Apt 15f
New York, NY 10024-3319
(123) 456-7890
fdbarth@gmail.com

Appointment

From: Hengst, Benjamin [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=C414E2BF04A246BB987D88498EEFFF06-HENGST, BENJAMIN]
Sent: 1/23/2018 7:46:29 PM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Charmley, William [charmley.william@epa.gov]; Simon, Karl [Simon.Karl@epa.gov]; Moran, Robin [moran.robin@epa.gov]

Subject: Meet with Motor & Equipment Manufacturers Association (Confirmed)
Attachments: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards ; Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards ; Auto Suppliers Meeting on the Midterm Evaluation for Vehicle GHG Standards
Location: WJC-N 5400 + Video with AA Ex. 6 Personal Privacy (PP)

Start: 2/5/2018 9:15:00 PM
End: 2/5/2018 10:00:00 PM
Show Time As: Busy

Re: Midterm Evaluation for Vehicle GHG Standards
To: Bill Wehrum, Chris Grundler, Ben Hengst
Cc: Mandy Gunasekara
Outside Attendees (in person):

1. Laurie Holmes, MEMA
2. Catherine Boland, MEMA
3. Dave Cetola, Johnson Matthey
4. Greg Garr, Umicore
5. Mike Belwood, Arconic
6. Tim Lynch, Morgan Lewis
7. Jennifer Heckmann, DENSO
8. Ana Meuweissen, Bosch
9. Erika Nielson, BW
10. Andrew Kenny, Magna

Confirmed 2/5 at 4:15pm: Auto Su... | Confirmed 2/5 at 4:15pm: Auto Su... | Auto Suppliers Meeting on the ...

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 1/18/2018 8:44:24 PM
To: Laurie Holmes [lholmes@mema.org]
CC: Lewis, Josh [Lewis.Josh@epa.gov]
Subject: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Laurie,
You are confirmed for a 45 minute in person meeting on Monday, February 5, 2018 at 4:15pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.
Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information. And based on the size of the room we plan to use, you should plan to bring no more than 10 attendees to this meeting.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Thursday, January 18, 2018 3:08 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Emily,
Yes, Mon. Feb. 5 at 4:15 will work for us.

Is there a number limit for the room? We will have some members with us.

Best,
Laurie

Sent from my iPhone

On Jan 18, 2018, at 11:08 AM, Atkinson, Emily <Atkinson.Emily@epa.gov> wrote:

Hi Laurie,

It looks like Bill Wehrum could be available for a 45 minute in person meeting on Monday, February 5 at 4:15pm.

Please advise if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Wednesday, January 17, 2018 10:34 AM
To: Lewis, Josh <Lewis.Josh@epa.gov>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Josh,
In addition to the week of the 29th we could also do Monday, February 5 or Tuesday, February 6 before 1.
Let me know if you need additional date ranges to work with.
Best,
Laurie

From: Lewis, Josh [mailto:Lewis.Josh@epa.gov]
Sent: Friday, January 12, 2018 2:16 PM
To: Laurie Holmes <lholmes@mema.org>; Catherine Boland <cboland@MEMA.ORG>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: FW: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

+ Emily and – Bill.

Is there a rough date or dates you were looking to come in?

Josh Lewis
Chief of Staff

EPA/Office of Air and Radiation
Office: 202 564 2095
Ex. 6 Personal Privacy (PP)

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Friday, January 12, 2018 10:56 AM
To: Wehrum, Bill <Wehrum.Bill@epa.gov>
Cc: Catherine Boland <cboland@MEMA.ORG>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Bill, Thank you so much.
Josh, Look forward to hearing from you.

From: Wehrum, Bill [mailto:Wehrum.Bill@epa.gov]
Sent: Friday, January 12, 2018 7:38 AM
To: Laurie Holmes <lholmes@mema.org>
Cc: Catherine Boland <cboland@MEMA.ORG>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Re: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Laurie. I'd be happy to talk with you. I've copied my chief of staff, Josh Lewis, who can help coordinate.

_____
Bill Wehrum
Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency
(202) 564-7404

On Jan 11, 2018, at 1:33 PM, Laurie Holmes <lholmes@mema.org> wrote:

> Bill:
> MEMA would like to request a meeting to discuss the midterm evaluation on the vehicle greenhouse gas emission standards.
>
> MEMA represents more than 1,000 companies that manufacture components, systems and materials for motor vehicles and represents the largest sector of manufacturing jobs in the U.S. Since auto suppliers play a major role in developing the technologies necessary for vehicle emission reduction, suppliers have a strong interest in the midterm evaluation and the standards. Our position is also not identical to the vehicle manufactures on the issue.
>
> It would be helpful if we could discuss with you the impact the program has had and will have on our industry.
>
> Look forward to hearing from you.
>
> Laurie Holmes
> Senior Director, Environmental Policy
> Motor & Equipment Manufacturers Association
> 1030 15th Street NW, Suite 500 East

Washington, DC 20005
Direct: 202-312-9247
Ex. 6 Personal Privacy (PP)
<image001.png>

April 10-11 | Washington, DC
www.mema.org/dcsummit

Message

From: Laurie Holmes [lholmes@mema.org]
Sent: 2/1/2018 2:38:05 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]
CC: Lewis, Josh [Lewis.Josh@epa.gov]
Subject: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Emily,
As requested, below is a list of participants for the meeting with Mr. Wehrum at 4:15 on Monday, February 5.
Thank you so much for your assistance in setting up this meeting.

Attendees:

1. Laurie Holmes, MEMA
2. Catherine Boland, MEMA
3. Dave Cetola, Johnson Matthey
4. Greg Garr, Umicore
5. Mike Belwood, Arconic
6. Joseph Fengler, Honeywell
7. Jennifer Heckmann, DENSO
8. Ana Meuweissen, Bosch
9. Erika Nielson, BW
10. Andrew Kenny, Magna

Best,
Laurie

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Thursday, January 18, 2018 3:44 PM
To: Laurie Holmes <lholmes@mema.org>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Laurie,
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Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

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the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.

Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information. And based on the size of the room we plan to use, you should plan to bring no more than 10 attendees to this meeting.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

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Sent: Thursday, January 18, 2018 3:08 PM
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Cc: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

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Laurie

Sent from my iPhone

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Hi Laurie,

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Please advise if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Wednesday, January 17, 2018 10:34 AM
To: Lewis, Josh <Lewis.Josh@epa.gov>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Josh,
In addition to the week of the 29th we could also do Monday, February 5 or Tuesday, February 6 before 1.
Let me know if you need additional date ranges to work with.
Best,
Laurie

From: Lewis, Josh [mailto:Lewis.Josh@epa.gov]
Sent: Friday, January 12, 2018 2:16 PM
To: Laurie Holmes <lholmes@mema.org>; Catherine Boland <cboland@MEMA.ORG>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: FW: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

+ Emily and – Bill.

Is there a rough date or dates you were looking to come in?

Josh Lewis
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 564 2095
Ex. 6 Personal Privacy (PP)

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Friday, January 12, 2018 10:56 AM
To: Wehrum, Bill <Wehrum.Bill@epa.gov>
Cc: Catherine Boland <cboland@MEMA.ORG>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Bill, Thank you so much.
Josh, Look forward to hearing from you.

From: Wehrum, Bill [mailto:Wehrum.Bill@epa.gov]
Sent: Friday, January 12, 2018 7:38 AM
To: Laurie Holmes <lholmes@mema.org>
Cc: Catherine Boland <cboland@MEMA.ORG>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Re: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Laurie. I'd be happy to talk with you. I've copied my chief of staff, Josh Lewis, who can help coordinate.

_____
Bill Wehrum
Assistant Administrator
Office of Air and Radiation

U.S. Environmental Protection Agency
(202) 564-7404

On Jan 11, 2018, at 1:33 PM, Laurie Holmes <lholmes@mema.org> wrote:

Bill:
MEMA would like to request a meeting to discuss the midterm evaluation on the vehicle greenhouse gas emission standards.

MEMA represents more than 1,000 companies that manufacture components, systems and materials for motor vehicles and represents the largest sector of manufacturing jobs in the U.S. Since auto suppliers play a major role in developing the technologies necessary for vehicle emission reduction, suppliers have a strong interest in the midterm evaluation and the standards. Our position is also not identical to the vehicle manufactures on the issue.

It would be helpful if we could discuss with you the impact the program has had and will have on our industry.

Look forward to hearing from you.

Laurie Holmes
Senior Director, Environmental Policy
Motor & Equipment Manufacturers Association
1030 15th Street NW, Suite 500 East
Washington, DC 20005
Direct: 202-312-9247
Ex. 6 Personal Privacy (PP)
<image001.png>
April 10-11 | Washington, DC
www.mema.org/dcsummit

Appointment

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/20/2018 1:17:29 PM
To: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Cook, Leila [cook.leila@epa.gov]; Charmley, William [charmley.william@epa.gov]
CC: Moran, Robin [moran.robin@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Simon, Karl [Simon.Karl@epa.gov]

Subject: Meet with Alliance for Vehicle Efficiency (Confirmed)
Attachments: FW: Meeting Request (2-20-2018) with Asst. Adm. Wehrum; Confirmed 2/20 at 10am: Meeting Request (2-20-2018) with Asst. Adm. Wehrum
Location: WJC-N 5400 + Video with Ann Arbor Room C174

Start: 2/20/2018 3:00:00 PM
End: 2/20/2018 3:45:00 PM
Show Time As: Tentative

Re: MTE
To: Bill Wehrum, Mandy Gunasekara, Chris Grundler, Ben Hengst, Lee Cook, Bill Charmley
Outside Attendees (in person): TBD

FW: Meeting Request (2-20-2...

Confirmed 2/20 at 10am: Meeting R...

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/5/2018 7:40:36 PM
To: Lee Janger [lee@armitagellc.com]
Subject: Confirmed 2/20 at 10am: Meeting Request (2-20-2018) with Asst. Adm. Wehrum

Hi Lee,
You are confirmed for 45 minute meeting on Tuesday, February 20, 2018 at 10:00am with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.
Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lee Janger [mailto:lee@armitagellc.com]
Sent: Monday, February 05, 2018 12:58 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Request (2-20-2018) with Asst. Adm. Wehrum

Emily,

That works great on our end. Thank you very much for making these arrangements. I will make sure to reach out a few days beforehand to brief you on attendees and materials to be discussed.

Best regards,
-Lee

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Monday, February 05, 2018 12:53 PM
To: Lee Janger <lee@armitagellc.com>
Subject: FW: Meeting Request (2-20-2018) with Asst. Adm. Wehrum

Hi Lee,

It looks like Bill Wehrum and Mandy Gunasekara could be available for a 45 minute meeting on Tuesday, February 20, 2018 at 10:00am.

Please advise if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lee Janger [mailto:lee@armitagellc.com]
Sent: Friday, February 02, 2018 2:19 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Meeting Request (2-20-2018) with Asst. Adm. Wehrum

Ms. Atkinson,

Thank you so much for taking the time to speak with me just now. This email is a follow up on to our brief discussion.

I represent a group of large auto suppliers (BorgWarner, Honeywell, Bosch, and others). Our focus is on advanced powertrain and emission control technologies. We advocate for technology neutral standards that encourage and support innovation across the auto industry.

We are very interested in speaking with Assistant Administrator Wehrum and others in the Office of Air and Radiation regarding the Midterm Evaluation (MTE). In response to the anticipated review, we have prepared data that we believe will assist EPA with their review of the appropriateness of the emissions standards for vehicle model years 2022-2025.

A few months ago, we had a great meeting with Mike Catanzaro at the White House, and after learning about our data review, strongly urged us to meet with your office to discuss our concerns on long term certainty, job growth and future technology investments as these are some of the key factors being looked at for the MTE.

As we finalize our data, I am hoping to arrange a meeting with Mr. Wehrum for **the late morning of February 20th** while many of members will be in Washington, DC. Please let me know if a meeting at that time is possible. We would likely be a group of 5-6 people.

More information on our group can be found at www.VehicleEfficiency.com Please let me know if I can provide any additional information. My contact information is also below.

Thank you again for your time and help.
-Lee

Alliance for Vehicle Efficiency

Lee J. Janger
Director, Legislative and Regulatory Affairs
202.607.0723
Lee@ArmitageLLC.com

>www.VehicleEfficiency.com<

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Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/2/2018 7:23:45 PM
To: Lewis, Josh [Lewis.Josh@epa.gov]
Subject: FW: Meeting Request (2-20-2018) with Asst. Adm. Wehrum

Meeting request for Bill

From: Lee Janger [mailto:lee@armitagellc.com]
Sent: Friday, February 02, 2018 2:19 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Meeting Request (2-20-2018) with Asst. Adm. Wehrum

Ms. Atkinson,

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Thank you again for your time and help.
-Lee

Alliance for Vehicle Efficiency

Lee J. Janger
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Message

From: Cliff, Steve@ARB [Steve.Cliff@arb.ca.gov]
Sent: 10/5/2017 11:47:54 PM
To: Simon, Karl [Simon.Karl@epa.gov]; Chris Grundler [grundler.chris@epa.gov]
Subject: Comments on EPA/NHTSA
Attachments: 2017-10-05 FINAL CARB AG Comment Ltr re Reconsider MTE FD.PDF; ATT00001.txt

We submitted these joint (with our attorney general) comments today, FYI

CALIFORNIA
AIR RESOURCES BOARD

October 5, 2017

Mr. Christopher Lieske
Office of Transportation and Air Quality (OTAQ),
Assessment and Standards Division (ASD)
Environmental Protection Agency
2000 Traverwood Drive
Ann Arbor, Michigan 48105

Ms. Rebecca Schade
Office of the Chief Counsel
National Highway Traffic Safety Administration
1200 New Jersey Avenue SE
Washington, DC 20590

RE: REQUESTS FOR COMMENT ON RECONSIDERATION OF THE FINAL DETERMINATION OF THE MID-TERM EVALUATION OF GREENHOUSE GAS EMISSIONS STANDARDS FOR MODEL YEAR 2022-2025 LIGHT-DUTY VEHICLES, AND ON MODEL YEAR 2021 GREENHOUSE GAS EMISSIONS STANDARDS, 82 FEDERAL REGISTER 39,551 (AUGUST 21, 2017)

Via: http://www.regulations.gov to Docket ID Nos. EPA-HQ-OAR-2015-0827 and NHTSA-2016-0068

Dear Mr. Liske and Ms. Schade:

The California Air Resources Board (CARB), joined by the California Attorney General's Office, submits the attached comments on the collective reconsideration by the U.S. Environmental Protection Agency (EPA) and the National Highway Traffic Safety Administration (NHTSA) of the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Year (MY) 2022-2025 Light-Duty Vehicles, and of the preceding MY 2021 Greenhouse Gas Emissions Standards. The latest information affirms the January 2017 Final Determination: the one national program for controlling greenhouse gas emissions and setting fuel economy standards is working as intended, and technology development has been faster than expected at lower costs than predicted.

California's collaboration for over half a century with industry, scientists, academics, and advocacy groups has provided a deep understanding of how gasoline and diesel combustion changes our environment and harms public health, and the myriad ways these harmful effects

can be reduced. Through our collective work, we have developed emission standards that have spurred innovation and efficiency. As a result, we have cleaner, better built, and longer lasting vehicles that have delivered consumer savings and uplifted our society.

Since the 2012 model year, even though California faces greater environmental and public health challenges than many other states, our greenhouse gas emissions standards have accepted compliance with the federal greenhouse gas emission standards.[1] In November of 2012, when we adopted the regulations accepting compliance with these federal emission standards, we agreed it made sense to assess the continued vitality of those standards mid-way through their terms.[2] Because of this, we worked with EPA, NHTSA, the automobile industry, and others in a collaborative process to develop a comprehensive, peer-reviewed analysis. Collectively, thousands of hours were devoted to this effort that produced thousands of pages documenting in detail comprehensive technical and economic information. From this lengthy review of industry's progress developing cost-effective technologies, the answer became clear: the harmonized national program standards are not only working as intended but could be further strengthened.[3]

We are is deeply concerned that EPA and NHTSA's intent to look back from the midterm evaluation to the MY 2021 greenhouse gas and harmonized Corporate Average Fuel Economy (CAFE) standards suggests they are considering weakening them, despite the evidence that doing so is unwarranted. We oppose any weakening, for any model year.

The emission reductions from these standards are critically important. The standards reduce criteria and toxic pollutants, deliver cleaner technology, and make communities healthier across the country. The existing standards save consumers money, and enable automobile manufacturers and technology suppliers to design to a consistent target.

The standards are also critical to addressing the changing climate that threatens our survival. The soon-to-be-published National Climate Assessment concludes that "human activities are now the dominant cause of the observed trends in climate."[4] The report goes on, consistent with the vast body of climate science, to describe the dire effects of these emissions in the United States--including increased temperatures, ocean acidification, fire, flood, drought, sickness, and economic destabilization. Transportation emissions, including mobile sources,

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[1] *See* Cal. Code Regs. Title 13, §§ 1961.1(a)(1)(A)(ii); 1961.3 (c); 76 Fed.Reg. 74,854, 74,863 (December 1, 2011).
[2] *See* CARB Reso. No. 12-35 (Nov. 15, 2012), p. 5, available at: https://www.arb.ca.gov/regact/2012/leviiidtc12/res12-35.pdf, last visited September 27, 2017.
[3] CARB opted to maintain the standards for the current period to provide continued regulatory certainty, but has initiated a process to develop stronger standards in later years.
[4] *U.S. Global Change Research Program Climate Science Special Report, Fifth-Order Draft* (2017), p. 33:11.

are 26% of the nation's greenhouse gas emissions,[5] 39% of California's, and over half of our emissions when upstream fuel production emissions are included.[6]

A devastating hurricane season shows the urgent need to act. The latest scientific analyses suggest that Hurricanes Harvey, Irma, and Maria were more severe than they otherwise would have been due to warmer ocean temperatures caused by anthropogenic greenhouse gas emissions.[7] This was the first known time two category-4 hurricanes hit the United States in one season. Harvey and Irma have claimed at least 120 lives and caused an estimated $245 billion of damage.[8] The damage from Maria is still being assessed, and the suffering worsens. No responsible government can properly ignore these impacts.

The most vulnerable of us have the most to gain from these standards--or lose if EPA and NHTSA went backwards and gave up these benefits. Costs for emission control technology would increase as manufacturer demand for the technology falls. The American market for vehicle technology would fall behind the pace of innovation globally. Potential lawsuits between the various agencies and industry would generate years of uncertainty about the standards that would misdirect resources away from cost-effective, beneficial improvements to vehicle technology. Consumers would pay more and suffer from volatile fuel prices and more of our national wealth would be diverted to foreign oil producers. The effects of climate change would continue to worsen.

We cannot allow this to happen. The need is too great. These standards are for the benefit and protection of all, including the most vulnerable, and reject the false narrative that clean technology and prosperity are mutually exclusive. The United States, led by California if necessary, will continue to lead the world. If the federal standards are relaxed despite the overwhelming body of evidence demonstrating they should continue as is, California will maintain its standards. Moreover, we will pursue all available legal remedies to overturn federal actions that are unsupported by the facts and law.

Based on the best available information, CARB is looking ahead to more ambitious standards for model years after 2025. It is vital that the federal agencies continue to coordinate their work with CARB to achieve the critical public health, economic, and national security goals set by our governing statutes. We have already begun meeting with the major automobile manufacturers to discuss our path forward, together. CARB is prepared to provide its technical and policy expertise from its own continued progress to assist EPA and NHTSA.

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[5] *See U.S. Greenhouse Gas Inventory Report: 1990-2014*, available at: https://19january2017snapshot.epa.gov/ghgemissions/us-greenhouse-gas-inventory-report-1990-2014_.html, last visited August 22, 2017.
[6] *See California Greenhouse Gas Emission Inventory - 2017 Edition*, available at: https://www.arb.ca.gov/cc/inventory/data/data.htm, last visited August 22, 2017.
[7] *Infra.*, note 24.
[8] *Infra.*, note 25.

We are disappointed that CARB has not been included in discussions prior to the federal government's recent actions. CARB standards cover millions of vehicles across the country in California and states that have adopted our standards. NHTSA and EPA committed to collaborate with CARB on developing and implementing a national program for American vehicles. Your unilateral movement away from our successful joint effort risks shattering the harmonized California and federal emission and fuel economy standards.

We optimistically look forward to working with EPA and NHTSA to affirm the National Program is working as intended, and to continuing progress towards solving our collective challenge. We also expect the opportunity to comment on any proposed deviation from the Final Determination, before such conclusions are finalized. You may contact Richard W. Corey at (916) 322-7077 or richard.corey@arb.ca.gov to discuss any of these issues.

Sincerely,

Richard W. Corey
Executive Officer
California Air Resources Board, Executive Office

DAVID A. ZONANA
Supervising Deputy Attorney General

For XAVIER BECERRA
California Attorney General

Attachment – See next pages 7 to 40

cc: See next page

cc: The Honorable Kevin de León, President pro Tempore
California State Senate
State Capitol, Room 205
Sacramento, California 95814

The Honorable Anthony Rendon, Speaker of the Assembly
California State Assembly
State Capitol, Room 219
Sacramento, California 95814

Richard Perry, Secretary
U.S. Department of Energy
1000 Independence Ave. SW
Washington DC 20585

Mary D. Nichols, Chair
California Air Resources Board

Docket ID Nos. EPA-HQ-OAR-2015-0827 and NHTSA-2016-0068

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Comments of the California Air Resources Board and the Attorney General of California

Responding to

The United States Environmental Protection Agency

and the

National Highway Traffic Safety Administration's

Requests for Comment on Reconsideration of the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Years 2022-2025 Light-Duty Vehicles, and on Model Year 2021 Greenhouse Gas Emissions Standards

Docket Nos.

EPA-HQ-OAR-2015-0827 and NHTSA-2016-0068

The California Air Resources Board (CARB) and California Attorney General's Office submit these responses to the United States Environmental Protection Agency (EPA) and the National Highway Traffic Safety Administration's (NHTSA) Federal Register notice requesting comment on Reconsideration of the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Years 2022-2025 Light-Duty Vehicles, and on Model Year 2021 Greenhouse Gas Emissions Standards.[9]

I. The Light-Duty Vehicle Greenhouse Gas Standards for MY 2022-2025 Remain Appropriate, as Shown by the U.S. EPA Final Determination and CARB's Midterm Review.

It would be improper for the EPA to consider weakening the current 2022-2025 model year greenhouse gas standards. Considering the advances in technology since the current standards were developed, it would, in fact, be arbitrary for EPA not to consider stronger standards, as there is record evidence that they are reasonable. Weaker standards would also be inconsistent with the methodology used to establish the 2017-2025 model year greenhouse gas emission standards.

In Section 202 of the federal Clean Air Act, Congress recognized that motor vehicle emissions standards would be needed to address pollution "which may reasonably be anticipated to endanger public health or welfare."[10] As the Supreme Court and the federal appellate courts have repeatedly recognized, now that EPA has determined that greenhouse gases endanger public health and welfare (as they manifestly do),[11] it must set reasoned, rigorous, standards

[9] 82 Fed.Reg. 39,551 (Aug. 21, 2017).
[10] 42 U.S.C. § 7521.
[11] 74 Fed.Reg. 66,496 (Dec. 15, 2009).

for vehicle emissions.[12] It would be arbitrary and capricious for EPA to weaken the standards it has set because this would fail to address the endangerment, and cannot be supported on the statutory bases which section 202 requires EPA to consider. On the contrary, a fair consideration of the statutory factors, and of the factors which EPA established by regulation specifically for its midterm review,[13] warrant continuing or, even strengthening the standards, as these comments and the record demonstrate. Indeed, because CARB will propose to move forward with stronger standards after 2025, as climate science demands and as technology supports, it is critical that the current standards continue to provide a glidepath towards still greater innovation in clean automotive design.

II. EPA and NHTSA Should Not Break the Harmonized California-National Program by Relaxing the Federal Standards.

Relaxing the federal program for MY 2021–2025, on the existing record that does not support doing so, would break the harmonized one national program for controlling greenhouse gas emission standards from light-duty vehicles. If EPA or NHTSA were to backtrack from the harmonized national program through 2025, California would be compelled to protect its interests against this unwarranted reversal. Other states that have adopted California's standards and rely on them may follow suit. This would end the harmonized national program that has benefited the American people, the automobile industry, and our world. EPA and NHTSA must consider the impact of this as they reconsider the Final Determination and whether to deviate from the current standards.

A. The Multi-State California and Federal Programs are Harmonized.

The existing and augural fuel economy standards and EPA's greenhouse gas emission standards through 2025 were developed in conjunction with each other - and with CARB as it considered its emission regulations.[14] California's standards are established under the authority of state law and a waiver from federal preemption under Section 209(b)[15] of the federal Clean Air Act.[16] The Administrator of the EPA must grant California a waiver, so long as the record supports it. Once a waiver is granted, other states whose air quality does not

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[12] *See generally, e.g.*, *Massachusetts v. EPA*, 549 U.S. 497 (2007).
[13] *See* 40 C.F.R. § 86.1818-12(h). Moreover, it would be arbitrary and capricious for EPA to weigh these factors dramatically differently than it already has done, because its prior decision was well-supported and based on a fair consideration of these factors. It would also be arbitrary for EPA to invent new factors, or weight old factors, in ways that are inconsistent with the protective and technology-forcing nature of the statute, or in any way that increased the danger vehicle pollution poses to health and welfare.
[14] See, e.g.: U.S. EPA, NHTSA, CARB, *Interim Joint Technical Assessment Report: Light Duty-Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards for Model Years 2017-2025* (*Interim Joint TAR*) (September 2010), available at: https://www.epa.gov/sites/production/files/2016-10/documents/ldv-ghg-tar.pdf, last visited August 17, 2017.
[15] 42 U.S.C. § 7543(a).
[16] *See* 78 Fed.Reg. 2,112 (January 9, 2013).

meet federal ambient air quality standards may elect to adopt California's standards as their own, pursuant to section 177 of the Clean Air Act.[17]

In 2011, CARB, vehicle manufacturers, EPA, and NHTSA committed to cooperatively develop national greenhouse gas emission standards and coordinated CAFE standards for 2017 through 2025 MY model year passenger cars and light-duty trucks. CARB committed to revise California's greenhouse gas emission regulations to allow vehicles certified to federal greenhouse gas emission standards for 2017 through 2025 model years to be "deemed in compliance" with the corresponding California greenhouse gas emission standards for those same model years, provided that the program did not change "substantially" from the final form it had when it was issued – which it so far has not.[18]

In 2012, CARB initially adopted California greenhouse gas emission standards for 2017 through 2025 MY passenger cars and light trucks, as part of its Advanced Clean Cars (ACC) program that combines both criteria and greenhouse gas pollutant emission standards and requirements for zero-emission vehicles into a single coordinated package of requirements for MY 2015 through 2025 vehicles.[19] In October 2012, EPA and NHTSA issued their final rules setting federal greenhouse gas emission and fuel economy standards for MY 2017 through 2025 vehicles,[20] and CARB subsequently amended the ACC program in November 2012 to provide vehicle manufacturers the option to demonstrate compliance with the "2017 through 2025 MY National greenhouse gas program."[21] In 2013, CARB obtained from EPA a waiver of preemption for the ACC program, as amended in November 2012.[22] Twelve other states have elected to adopt California's greenhouse emission standards for model years out to 2025 (as well as its criteria pollutant standards), pursuant to Section 177 of the Clean Air Act.[23]

B. California Must Obtain the Benefits of the Harmonized National Program – Either With or Without the Current Federal Standards.

CARB's greenhouse gas motor vehicle emission standards are a fundamental component of California's strategy to protect the health of its citizens and its natural resources from the

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[17] 42 U.S.C. § 7507.
[18] *See* CARB Reso. No. 12-35 (Nov. 15, 2012), p. 4, available at: https://www.arb.ca.gov/regact/2012/leviiidtc12/res12-35.pdf, last visited September 27, 2017. CARB's commitment specifically referenced federal greenhouse gas emission standards adopted by EPA for MY 2017 through 2025 vehicles that were substantially as described in EPA and NHTSA's Notice of Intent for MY 2017 through 2025 model years, issued in July of 2011.
[19] CARB Reso. No. 12-21 (Mar. 22, 2012), p. 3.
[20] 77 Fed.Reg. 62,624 (Oct. 15, 2012).
[21] Defined as "the national program that applies to new 2017 through 2025 model year passenger cars, light-duty-trucks, and medium-duty passenger vehicles as adopted by the U.S. Environmental Protection Agency as codified in 40 C.F.R. Part 86, Subpart S, § 1801-01, et seq."] in lieu of complying with otherwise applicable California greenhouse gas emission standards. Cal. Code Regs., tit. 13, § 1961.3(c).
[22] 78 Fed.Reg. 2112 (January 9, 2013).
[23] See CARB, Compilation of Section 177 States, May 10, 2017, citing data from https://autoalliance.org/energy-environment/zev-sales-dashboard/.

threats of climate change. NHTSA's CAFE standards and EPA and CARB's greenhouse gas motor vehicle emission standards are interconnected. Thus, while there are significant numbers of vehicles (and hence emissions) not governed by the California standards, California and the other states that have adopted California's greenhouse gas emission standards would suffer climate change, air pollution, and other environmental as well as economic harms, if EPA were to relax the greenhouse gas emission standards, or if NHTSA were to relax the CAFE standards from the current standards applicable to MY 2021 vehicles, or the augural standards for MY 2022 - 2025.

The effects of climate change are apparent. Hurricanes Harvey, Irma and Maria were more severe than they otherwise would have been due to warmer ocean temperatures caused by anthropogenic greenhouse gas emissions. [24] This was the first known time two category-4

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[24] There is broad agreement in the relevant scientific literature that human factors (greenhouse gases and aerosols) have had a measurable impact on the observed oceanic and atmospheric variability in the North Atlantic, and there is medium confidence that this has contributed to the observed increase in hurricane activity since the 1970s. Several studies have projected increases of precipitation rates within hurricanes over ocean regions (Knutson et al. 2010), particularly for the Atlantic basin (Knutson et al. 2013). The primary physical mechanism for this increase is the enhanced water vapor content in the warmer atmosphere, which enhances moisture convergence into the storm for a given circulation strength, although a more intense circulation can also contribute (Wang et al. 2015). Since hurricanes are responsible for many of the most extreme precipitation events in the southeastern United States (Kunkel et al. 2010, 2012), such events are likely to be even heavier in the future. Both theory and numerical modeling simulations (in general) indicate an increase in tropical cyclone (TC) intensity in a warmer world, and the models generally show an increase in the number of very intense TCs (Camargo 2013; Walsh et al. 2015; Knutson et al. 2015). For Atlantic and eastern North Pacific hurricanes and western North Pacific typhoons, increases are projected in precipitation rates (high confidence) and intensity (medium confidence). The frequency of the most intense of these storms is projected to increase in the Atlantic and western North Pacific and in the eastern North Pacific (medium confidence). In addition, sea level rise will increase the frequency and extent of extreme flooding associated with coastal storms, such as hurricanes. A projected increase in the intensity of hurricanes in the North Atlantic could increase the probability of extreme flooding along most of the U.S. Atlantic and Gulf Coast states beyond what would be projected based solely on relative sea level rise.
See, e.g.,: Camargo, S. J., 2013: Global and regional aspects of tropical cyclone activity in the CMIP5 models, Journal of Climate, 26 (24), 9880–9902, doi:10.1175/JCLI-D-12-00549.1;
Knutson, T.R., J.L. McBride, J. Chan, K. Emanuel, G. Holland, C. Landsea, I. Held, J.P. Kossin, A.K. Srivastava, and M. Sugi, 2010: Tropical cyclones and climate change. Nature Geoscience, 3, 157-163. http://dx.doi.org/10.1038/ngeo779;
Knutson, T.R., J.J. Sirutis, G.A. Vecchi, S. Garner, M. Zhao, H.-S. Kim, M. Bender, R.E. Tuleya, I.M. Held, and G. Villarini, 2013: Dynamical Downscaling Projections of Twenty-First-Century Atlantic Hurricane Activity: CMIP3 and CMIP5 Model-Based Scenarios. Journal of Climate, 27, 6591-6617. http://dx.doi.org/10.1175/jcli-d-12-00539.1;
Knutson, T. R., and Coauthors, 2015: Global Projections of Intense Tropical Cyclone Activity for the Late Twenty-First Century from Dynamical Downscaling of CMIP5/RCP4.5 Scenarios. Journal of Climate, 28 (18), 7203-7224, doi:10.1175/JCLI-D-15-0129.1;
Kunkel, K.E., D.R. Easterling, D.A.R. Kristovich, B. Gleason, L. Stoecker, and R. Smith, 2010: Recent increases in U.S. heavy precipitation associated with tropical cyclones. Geophysical Research Letters, 37, L24706. http://dx.doi.org/10.1029/2010GL045164;

hurricanes hit the United States in one season. Hurricanes Harvey and Irma have claimed at least 120 lives and caused an estimated $245 billion of damage.[25] The extreme suffering levied by Maria continues to worsen.

We described some of the impacts of climate change in our comment letter to NHTSA on the scope of the EIS for the MY 2022 – 2025 CAFE standards, which we fully incorporate here.[26] Those impacts include:

- With continued increases in greenhouse gas (GHG) emissions, there will be significant reductions in runoff water in California.[27]

- In the Southwest U.S. over the past 50 years, climate change has contributed to decreased late winter precipitation in the form of snow, earlier snow melt, and earlier arrival of a high proportion of annual stream flow.[28, 29]

- Ecosystems are crucial in buffering extreme climate events, such as wildfires and floods.[30] For example, in the case of floods, climate change contributes to the loss of

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Walsh, K. J. E., and Coauthors, 2015: Hurricanes and climate: The U.S. CLIVAR Working Group on Hurricanes. Bulletin of the American Meteorological Society, 96 (12) (6), 997-1017, doi:10.1175/BAMS-D-13-00242.1.
Wang, C.-C., B.-X. Lin, C.-T. Chen, and S.-H. Lo, 2015: Quantifying the Effects of Long-Term Climate Change on Tropical Cyclone Rainfall using a Cloud-Resolving Model: Examples of Two Landfall Typhoons in Taiwan. Journal of Climate, 28, 66-85. http://dx.doi.org/10.1175/JCLI30D-14-00044.1.

[25] Hurricane Irma claimed 31 U.S. lives among 69 total, and caused an estimated $55 billion in damages, as of September 14, 2017, as reported by CBS News, available at: https://www.cbsnews.com/news/huricane-irma-death-toll-florida-power-outage/, last visited September 14, 2017; Hurricane Harvey claimed 63 U.S. lives, as of September 14, 2017, as reported by CBS News, available at: https://www.cbsnews.com/news/hurricane-harvey-death-toll-flood-houston-recovery-harris-county/, and caused as much as $190 billion in damages, available at: https://www.cbsnews.com/news/how-hurricane-harveys-cost-stacks-up-against-past-disasters/, last visited September 14, 2017.

[26] Document ID No. NHTSA-2017-0069-0138.

[27] G. Garfin, A. Jardine, R. Merideth, M. Black, and S. LeRoy, Eds., *Assessment of Climate Change in the Southwest United States*, Island Press, ch. 6, Cayan, D., K. Kunkel, C. Castro, A. Gershunov, J. Barsugli, A. Ray, J. Overpeck, M. Anderson, J. Russell, R. B., R. I., and P. Duffy, pp. 153-196 (2013), available at: http://www.swcarr.arizona.edu/sites/all/themes/files/SW-NCA-color-FINALweb.pdf, last visited August 24, 2017.

[28] Hidalgo, H. G., T. Das, M. D. Dettinger, D. R. Cayan, D. W. Pierce, T. P. Barnett, G. Bala, A. Mirin, A. W. Wood, C. Bonfils, B. D. Santer, and T. Nozawa, *2009: Detection and attribution of streamflow timing changes to climate change in the western United States*. Journal of Climate, 22, 3838-3855, doi:10.1175/2009jcli2470.1.

[29] Pierce, D. W., T. P. Barnett, H. G. Hidalgo, T. Das, C. Bonfils, B. D. Santer, G. Bala, M. D. Dettinger, D. R. Cayan, A. Mirin, A. W. Wood, and T. Nozawa, *2008: Attribution of declining western US snowpack to human effects*. Journal of Climate, 21, 6425-6444, doi:10.1175/2008JCLI2405.1.

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natural areas such as salt marshes and floodplain wetlands, which makes these areas more vulnerable to catastrophic damage from extreme events.[31]

- Climate change-induced increases in wildfires are projected to result in up to a 74% increase in California burn areas, with the northern part of the state possibly doubling its risk by the end of the century, if GHG emissions are not abated.[32]

- Climate change has led to changes in plant and animal species distributions.[33, 34] If species are not able to keep up with these changes (for example, due to movement restrictions), they may face local extinction; thus, in combination with range shifts, the resulting mix of species may change drastically.[35, 36, 37, 38]

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[31] Fitzgerald, D. M., M. S. Fenster, B. A. Argow, and I. V. Buynevich, *2008: Coastal impacts due to sea-level rise.* Annual Review of Earth and Planetary Sciences, Annual Reviews, 601-647.
[32] Westerling, A. L., B. P. Bryant, H. K. Preisler, T. P. Holmes, H. G. Hidalgo, T. Das, and S. R. Shrestha, *2011: Climate change and growth scenarios for California wildfire.* Climatic Change, 109, 445-463, doi:10.1007/s10584-011-0329.
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[34] Staudinger, M. D., S. L. Carter, M. S. Cross, N. S. Dubois, J. E. Duffy, C. Enquist, R. Griffis, J. J. Hellmann, J. J. Lawler, J. O'Leary, S. A. Morrison, L. Sneddon, B. A. Stein, L. M. Thompson, and W. Turner, *2013: Biodiversity in a changing climate: A synthesis of current and projected trends in the US. Frontiers in Ecology and the Environmen*t, 11, 465-473, doi:10.1890/120272, available at: http://onlinelibrary.wiley.com/doi/10.1890/120272/abstract, last visited on August 17, 2017.
[35] Staudinger, M. D., N. B. Grimm, A. Staudt, S. L. Carter, F. S. Chapin, III, P. Kareiva, M. Ruckelshaus, and B. A. Stein, *2012: Impacts of Climate Change on Biodiversity, Ecosystems, and Ecosystem Services. Technical Input to the 2013 National Climate Assessment*, p. 296, U.S. Geological Survey, Reston, VA, available at: https://downloads.globalchange.gov/nca/technical_inputs/Biodiversity-Ecosystems-and-Ecosystem-Services-Technical-Input.pdf, last visited August 17, 2017.
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[37] Cheung, W. W. L., V. W. Y. Lam, J. L. Sarmiento, K. Ke¬arney, R. Watson, and D. Pauly, *2009: Projecting global marine biodiversity impacts under climate change scenarios. Fish and Fisheries*, 10, 235-251, doi:10.1111/j.1467- 2979.2008.00315.x, available at: http://onlinelibrary.wiley.com/doi/10.1111/j.1467-2979.2008.00315.x/abstract, last visited August 17, 2017.
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- Invasive plant and insect species are likely to become more common.[39, 40] Agricultural production will likely suffer; for example, the invasive yellow star-thistle, which is currently costing California annually $17 million in forage and control efforts[41] and $75 million in water losses, is expected to increase with climate change.[42]

- Heat waves have become more frequent in the U.S., particularly in the West; tree ring data for this region suggest that drought during the past decade is the driest it has been in 800 years.[43, 44]

- Models of sea level rise predict increases between about 2 feet to as much as 6 feet by 2100.[45, 46, 47, 48]

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[39] Bradley, B. A., D. S. Wilcove, and M. Oppenheimer, *2010: Climate change increases risk of plant invasion in the Eastern United States. Biological Invasions*, 12, 1855-1872, doi:10.1007/s10530-009-9597-y, available at: http://europepmc.org/abstract/AGR/IND44367832/reload=0;jsessionid=geMUvZpMPs0zzRUz8D6h.2, last visited August 17, 2017.

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[41] Eagle, A. J., M. E. Eiswerth, W. S. Johnson, S. E. Schoenig, and G. C. van Kooten, *2007: Costs and losses imposed on California ranchers by yellow starthistle. Rangeland Ecology & Management*, 60, 369-377, https://doi.org/10.2111/1551-5028(2007)60[369:CALIOC]2.0.CO;2.

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[43] Karl, T. R., J. T. Melillo, and T. C. Peterson, Eds., *2009: Global Climate Change Impacts in the United States. Cambridge University Press*, p. 189, available at: http://downloads.globalchange.gov/usimpacts/pdfs/climate-impacts-report.pdf, last visited August 24, 2017.

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[45] Grinsted, A., J. C. Moore, and S. Jevrejeva, *2010: Reconstructing sea level from paleo and projected temperatures 200 to 2100 AD. Climate Dynamics*, 34, 461-472, doi:10.1007/s00382-008-0507-2, available at: http://link.springer.com/article/10.1007/s00382-008-0507-2/fulltext.html, last visited August 24, 2017.

[46] Jevrejeva, S., J. C. Moore, and A. Grinsted, *2012: Sea level projections to AD2500 with a new generation of climate change scenarios. Global and Planetary Change*, pp. 80-81, 14-20, doi:10.1016/j. gloplacha.2011.09.006.

[47] Rahmstorf, S., G. Foster, and A. Cazenave, *2012: Comparing climate projections to observations up to 2011. Environmental Research Letters*, 7, 044035, doi:10.1088/1748-9326/7/4/044035, available at: http://iopscience.iop.org/1748-9326/7/4/044035/pdf/1748- 9326_7_4_044035.pdf, last visited August 24, 2017.

[48] Vermeer, M., and S. Rahmstorf, *2009: Global sea level linked to global temperature. Proceedings of the National Academy of Sciences*, 106, 21527-21532, doi:10.1073/pnas.0907765106.

The damage and threat to California from greenhouse gas emissions are too great to ignore. California must do what it can to reduce these emissions. Controlling motor vehicle greenhouse gas emissions is a critical and necessary means to do so.

C. EPA Properly Issued the Final Determination in January 2017

We agree with several Attorneys General and others that the Final Determination of January 2017 was reached in accordance with the law.[49] EPA met its regulatory requirements for a draft technical assessment report (Draft TAR),[50] followed by a Final Determination by the deadline. Indeed, EPA went beyond the minimum by providing an opportunity for public comment on a proposed Final Determination.[51] This wasteful exercise is diverting resources from true progress.

D. The Existing Record Supports the Current Standards.

In reviewing the current 2022-2025 model year greenhouse gas standards, EPA and NHTSA must consider the entirety of the prior analyses that support those standards, reflected in this docket, and the related NHTSA dockets: NHTSA-2010-0131, NHTSA-2011-0056, NHTSA-2016-0068, and NHTSA-2017-0069. EPA and NHTSA's consideration must also include, but not be limited to, the following documents:

- NHTSA: *Corporate Average Fuel Economy Standards Passenger Cars and Light Trucks Model Years 2017-2025: Final Environmental Impact Statement: Summary,* July 2012.[52]

- U.S. EPA and NHTSA, October 15, 2012: *2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards.*[53]

- CARB: *Staff Report: Initial Statement of Reasons for Proposed Rulemaking; Public Hearing to Consider the "LEV III" Amendments to the California Greenhouse Gas and Criteria Pollutant Exhaust and Evaporative Emission Standards and Test Procedures*

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[49] Attorneys General of New York, Connecticut, Delaware, the District of Columbia, Iowa, Maine, Maryland, Massachusetts, Oregon, Pennsylvania, Rhode Island, Vermont, and Washington and the Secretary of the Commonwealth of Pennsylvania Department of Environmental Protection, to E. Scott Pruitt, Administrator, U.S. EPA, re: Midterm Evaluation of Emission Standards for Passenger Cars and Light Duty Trucks for Model Years 2022-25, June 8, 2017, pp. 2-3.
[50] U.S. EPA, NHTSA, CARB, Draft Technical Assessment Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025 (Draft TAR) (July 2016).
[51] 81 Fed.Reg. 87,927 (Dec. 6, 2016).
[52] Available at: https://www.regulations.gov/document?D=NHTSA-2011-0056-2088, last visited August 17, 2017.
[53] Final rule, 77 Fed.Reg. 62,624, 63,033.

and to the On-Board Diagnostic System Requirements for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, and to the Evaporative Emission Requirements for Heavy-Duty Vehicles, December 7, 2011.[54]

Since the current 2022-2025 model year greenhouse gas standards were established, the industry has advanced further than predicted. Recent information that EPA must consider shows these standards should, if anything, be strengthened. The National Academy of Sciences, in reviewing the EPA and NHTSA analyses supporting the emission and fuel economy standards through 2025, found them "to be thorough and of high caliber on the whole."[55]

Following the original rulemaking analysis, the multi-year midterm evaluation process produced an exhaustive joint EPA-NHTSA-CARB technical analysis (2016 TAR) that concluded the current 2022-2025 model year greenhouse gas standards are more than feasible based on technologies that are currently available.[56] In addition, EPA concluded and confirmed in the Final Determination[57] that the net lifetime consumer savings for an "average" MY 2025 vehicle compared to the MY 2021 greenhouse gas standards will be $1,650.

EPA noted in the Final Determination that this technical analysis has been criticized by some auto industry commenters as being unrealistic in terms of the effectiveness of projected vehicle technologies. EPA summarized these comments and correctly pointed out the flaws in industry's arguments as follows:

> Some auto industry commenters stated generally that the EPA models and/or effectiveness assumptions are overly optimistic, while other commenters recommended higher technology effectiveness values than we estimated in the Draft TAR. In some cases, the commenters either did not provide any supporting evidence, or provided evidence that was incomplete, not applicable, or not relevant to an assessment of the cost, effectiveness, and

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[54] Available at: https://www.arb.ca.gov/regact/2012/leviiighg2012/levisor.pdf, last visited August 17, 2017.
[55] NAS: 2015: *Cost, Effectiveness, and Deployment of Fuel Economy Technologies for Light-Duty Vehicles*; (p. 2), available at: https://www.nap.edu/catalog/21744/cost-effectiveness-and-deployment-of-fuel-economy-technologies-for-light-duty-vehicles, last visited August 17, 2017.
[56] Draft TAR. "The agencies' independent analyses complement one another and reach similar conclusions: A wider range of technologies exist for manufacturers to use to meet the MY2022-2025 standards, and at costs that are similar or lower, than those projected in the 2012 rule." p. ES-2. "...because EPA and NHTSA developed independent assessments of technology cost, effectiveness, and reference case projections, the compliance pathways and associated costs that result are also different. Consideration of these two results provides greater confidence that compliance can be achieved through a number of different technology pathways." p. ES-12, available at: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100OXEO.PDF?Dockey=P100OXEO.PDF, last visited August 17, 2017.
[57] United States Environmental Protection Agency. *Final Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation* (January 2017, EPA-420-R-17-001) (p. 7), available at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100QQ91.pdf, last visited September 19, 2017.

> implementation feasibility in MYs 2022-2025. In particular, the conclusion drawn by the Alliance of Automobile Manufacturers that "MY2021 and MY2025 targets cannot be met with the suite of technologies at the deployment rates projected by the Agencies in the 2012 FRM" is based on the premise that the only possible technology available in MY2025 will be represented by technology already contained in the Draft TAR's MY2014 baseline fleet, and that technology will not improve in efficiency.

In sum:

> EPA disagreed with this assertion, noting that it is not plausible that the best gasoline powertrain efficiencies of today represent the limit of achievable efficiencies in the future. Even setting aside the assumption that the best available technologies today will undergo no improvement in future years (a premise the auto industry has disproved time and again), the methodology used in the Alliance-contracted study (which was not peer reviewed) does not even allow for the recombination of existing technologies, and thus severely and unduly limits potential effectiveness increases obtainable by MY2025.... Further, EPA disagreed with this assumption that the only technology combinations available in MY2025 are those that are present in the MY2014 fleet. EPA noted that events had already disproven this assumption and provided, as one specific example, a Ford-introduced 10-speed automatic transmission on the MY2017 F150 paired with a turbocharged downsized engine which represents a technology combination that was not previously available and was therefore not considered (and would be deemed impossible) by the Alliance-contracted study.[58]

These conclusions remain sound and the evidence supports staying the course.

III. New Information Since the Midterm Review Further Confirms the Current Standards Remain Appropriate.

The latest information continues to confirm that the greenhouse gas emission standards and the established and augural fuel economy standards for MY 2021–2025 should be maintained or strengthened. CARB completed its independent midterm review of the greenhouse gas emission standards (along with emission standards for other pollutants and for zero-emission vehicles) after the Final Determination was issued in January 2017, was comprehensive. The information and analyses reflected in it must be considered by EPA and NHTSA as they reconsider the Final Determination. We incorporate the entirety of it here, which is available at: https://www.arb.ca.gov/msprog/acc/mtr/acc_mtr_finalreport_full.pdf.

[58] Final Determination, pp. 12-15, ch. 2: Technology Assessment, section 2.1 "Effectiveness Assessment: General Comments, Technology Packages, Penetrations, and Sufficiency of Non-Electrified Technologies," "summary of comments on the Draft TAR addressed in the Proposed Determination."

Based on its midterm review, CARB found that the current standards should be maintained.[59] CARB agreed with the findings in EPA's Final Determination, concluding:

> The current national 2022 through 2025 model year greenhouse gas emission standards can be readily met at the same or lower cost than originally projected when the standards were adopted in 2012, predominantly with advanced gasoline engines and transmissions.[60]

In terms of greenhouse gas emission control technology developments, CARB's midterm review found, among other things, that:

- Manufacturers have successfully employed a variety of technologies that reduce greenhouse gas emissions and increase fuel efficiency many at a faster rate of deployment than was originally projected, notably, large penetration rates of advanced engine and transmissions across the industry in the last five years.

- Currently, manufacturers are over complying with the greenhouse gas requirements[61] and are offering various vehicles on the road today that are already able to comply with the greenhouse gas standards for later model years. For example, of the more than 1,300 conventional vehicle model configurations available in 2016, 23 truck configurations,[62] 23 sport utility vehicle (SUV) configurations,[63] and 26 passenger car configurations[64] meet 2020 or later greenhouse gas standards with a conventional gasoline powertrain. An additional 78 model variants comprised of hybrid electric vehicles, plug-in hybrid electric vehicles, and battery electric vehicles also meet the 2020 or later standards.

The latest information continues to support maintaining or strengthening the current standards.

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[59] CARB, Advanced Clean Cars Midterm Review, Reso. 17-3 (March 24, 2017), available at: https://www.arb.ca.gov/msprog/acc/mtr/res17-3.pdf, last visited September 22, 2017.
[60] CARB: California Advanced Clean Cars Midterm Review, *Summary Report for the Technical Analysis of the Light-Duty Vehicles Standards, with Appendices*: January 18, 2017 (p. ES-3), available at: https://www.arb.ca.gov/msprog/acc/mtr/acc_mtr_finalreport_full.pdf, last visited September 19, 2017. *See* California Midterm Review full report and appendices: January 18, 2017, available at: https://www.arb.ca.gov/msprog/acc/acc-mtr.htm , last visited September 19, 2017.
[61] United States Environmental Protection Agency. *Greenhouse Gas Emission Standards for Light-Duty Vehicles: Manufacturer Performance Report for the 2014 Model Year*. EPA-420-R-15-026. December 2015, available at: https://nepis.epa.gov/Exe/ZyPDF.cgi/P100O5TH.PDF?Dockey=P100O5TH.PDF last visited September 19, 2017.
[62] Some variants of the F-150 meet the 2024 greenhouse gas standards while some variants of the Ram 1500 and the Chevrolet Silverado meet the 2021 greenhouse gas standards.
[63] Such as the Subaru Outback, the Nissan Rogue, and the Honda CR-V. Includes minivans and station wagons classified as trucks.
[64] Such as the Mazda 6, the Hyundai Sonata, and the Honda Civic.

A. The Clean Air Act Requires EPA and NHTSA to Consider the Relevant Factors to Protect Public Health and Conserve Fuel.

EPA and NHTSA have requested comment on various factors to be considered in the Final Determination.[65] Congress has determined the guiding principles for EPA and NHTSA's consideration: the public health and welfare. EPA must reduce the emissions from motor vehicles that "cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare,"[66] and EPA has recognized this includes greenhouse gas emissions. NHTSA must set the "maximum feasible average fuel economy standards."[67] The factors about which EPA and NHTSA seek comment must be weighed in a manner that makes the public health and welfare the primary concern; they may not be considered in a manner that subordinates those goals to any other.[68]

When considering the various relevant factors, EPA may not avoid its obligations to control emissions in deference to NHTSA.[69] EPA and NHTSA have already shown, through the harmonized program, that emissions and fuel economy standards may complement each other. NHTSA must also consider EPA's established emission standards, as well as CARB's, as "other motor vehicle standards of the government" when setting fuel economy standards.[70]

To the extent any of the factors about which EPA and NHTSA requested comment do not protect public health, lack bearing on the maximum feasible fuel economy, or were not enumerated by Congress, they are irrelevant and should not be considered. This would include factors like apparent "consumer preference."

With this in mind, we offer further comments on the following factors on which EPA and NHTSA requested comment.

B. Feasibility: The Availability and Effectiveness of Technology, and the Appropriate Lead Time for Introduction of Technology

CARB held an Advanced Clean Cars Symposium, called The Road Ahead, on September 27-28, 2016, focused on evaluating more recent technology beyond the 2016 TAR. The second day of the symposium covered engine and vehicle technologies that were not extensively used in the analysis for the 2016 TAR but are expected to be on production vehicles in the near term

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[65] See 82 Fed.Reg. at 39,553.
[66] 42 U.S.C. § 7521(a)(1), CAA § 202(a)(1).
[67] 49 U.S.C. § 32902(f).
[68] *Husqvarna AB v. E.P.A.* 254 F.3d 195, 200 (D.C. Cir. 2001) [construing CAA § 213(a)(3), 42 U.S.C. § 7547(a(3), which is similar to CAA § 202]; *Center for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1195 (9th Cir. 2008).
[69] *Massachusetts v. EPA*, 549 U.S. at 531.
[70] 49 U.S.C. § 32902(a), (f).

and could help meet the adopted greenhouse gas and particulate matter standards.[71] Symposium speakers and the topics they discussed included:

- Dr. Dean Tomazic, Executive Vice President & CTO, FEV North America, Inc., discussed "Potential Game Changing Technologies" including "development trends in gasoline engines" and transmissions such as:
    - Combustion efficiency improvements (e.g., direct injection and variable charge motion, variable compression ratio, Miller/Atkinson cycle engines, cooled exhaust gas recirculation, and controlled auto-ignition);
    - Reduction of throttling losses (e.g., downsizing, boosting, cylinder deactivation, variable valve train, and lean-burn operation);
    - Electrification/hybridization (e.g., micro/mild/full hybrid, plug-in hybrid electric vehicle technology, 48 volt infrastructure, and accessory electrification); and,
    - Reduction of parasitic and idle losses (e.g., friction reduction, stop/start, advanced thermal management, and (again) accessory electrification);
    - "Direct" transmission efficiency improvements (e.g., high efficiency oil pumps, minimized open clutches, low-loss bearings/seals/gears, low-leakage hydraulics, and low-viscosity oils);
    - "Indirect" transmission efficiency improvements (e.g., increased number of speeds, increased ratio spread, aggressive torque converter lock-up, and active thermal management); and,
    - Transmission types (e.g., manual transmission/automated manual transmission/dual-clutch transmission, planetary automatics, continuously variable transmission, and hybrids).[72]
- Mr. Yutaka Fujimoto, Director of Powertrain, Nissan North America, Inc., discussed the Variable Compression Turbo Engine, which he identified as "one of the key technologies to meet future requirements with sustainability."[73]

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[71] Presentations are submitted with this letter and are available at: https://www.arb.ca.gov/msprog/acc/acc-symposium.htm, last visited September 19, 2017.
[72] *GHG Reducing Advancements and Technologies*, Dr. Dean Tomazic, Executive Vice President & CTO, FEV North America, Inc.; available at: https://www.arb.ca.gov/msprog/consumer_info/advanced_clean_cars/ghg_reducing_advancements_and_technologies_dean_tomazic.pdf, last visited September 19, 2017.
[73] *Introduction of Variable Compression Turbo Engine*, Yutaka Fujimoto, Director of Powertrain, Nissan North America, Inc.; available at:

- Mr. Reiji Okita, Powertrain Development Program Manager, Mazda Motor Corporation, discussed the development of Mazda's SKYACTIV-G 2.5L "dynamic pressure" turbocharged engine, which reduces fuel consumption at middle and high loads and improves vehicle performance.[74] More recently, Mazda has announced plans to introduce a next-generation engine called SKYACTIV-X on production vehicles in 2019. According to this announcement "Compression ignition makes possible a super lean burn4 [sic] that improves engine efficiency up to 20-30 percent over the current SKYACTIV-G, and from 35-45 percent over Mazda's 2008 gasoline engine of the same displacement. SKYACTIV-X even equals or exceeds the latest SKYACTIV-D diesel engine in fuel efficiency."[75] "The SkyActiv-X engine will be fitted with a supercharger and will produce 10 percent to 30 percent more torque than current (SkyActiv-G) engine. Homogeneous charge compression ignition (HCCI) makes possible a super lean burn mode that raises engine efficiency 20 to 30 percent over the current gas engine, is 35 percent to 45 percent more economical than Mazda's comparable 2008 gasoline engine, and "equals or exceeds" the new diesel in fuel efficiency.[76]

- Dr. Matthew Younkins, Chief Engineer, Powertrain, Tula Technology Incorporated, discussed the potential benefits of cylinder deactivation to achieve "significant fuel efficiency gains for spark ignited engines at a compelling cost."[77]

Since the completion of the CARB Midterm Review report in January of 2017, two additional studies have been completed that support the appropriateness of the current national 2022 through 2025 model year greenhouse gas emission standards, which should be considered by EPA.

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https://www.arb.ca.gov/msprog/consumer_info/advanced_clean_cars/vct_engine_technology_yutaka_fujimoto.pdf, last visited September 19, 2017.

[74] *Mazda SKYACTIV-G Engine with New Boosting Technology*, Reiji Okita, Powertrain Development Program Manager, Mazda Motor Corporation; available at: https://www.arb.ca.gov/msprog/consumer_info/advanced_clean_cars/new_engine_technology_reiji_okita.pdf, last visited September 19, 2017.

[75] Press Release - *Mazda Announces Long-Term Vision for Technology Development, 'Sustainable Zoom-Zoom 2030'.* August 8, 2018; available at: https://www.mazda-press.com/services/download.ashx?id=598886c5b47649433cdbd0c0&t=pdf&h=e7%2fuyEdwrdXdurB%2f0TcRIQSOuTUsK4vgaxkhss471Vw%3d, last visited September 19, 2017.

[76] *Mazda's 2019 Breakthrough: a Diesel Engine That Runs on Gasoline*. Bill Howard. August 9, 2017. Available at: https://www.extremetech.com/extreme/253842-mazdas-2019-efficiency-breakthrough-diesel-engine-runs-gasoline, last visited September 20, 2017.

[77] *Tula Technology's Dynamic Skip Fire*, Dr. Matthew Younkins, Chief Engineer, Powertrain, Tula Technology Incorporated; available at: https://www.arb.ca.gov/msprog/consumer_info/advanced_clean_cars/potential_benefits_of_cylinder_deactivation_matthew_younkins.pdf, last visited September 19, 2017.

The first study was conducted by the International Council on Clean Transportation (ICCT). ICCT published a report on March 22, 2017, titled *Efficiency Technology and Cost Assessment for U.S. 2025–2030 Light-Duty Vehicles*. This study examined how component costs are lower than EPA's projected values in their Proposed Determination and concluded that 8%–10% greater efficiency improvement is available and cost effective for vehicles by 2025, compared to the latest U.S. regulatory analysis, and previous costs of compliance have been greatly overestimated.[78] Key differences between the EPA analysis and ICCT's revised analysis are shown in Table 1 from the ICCT report, below.

Table 1. Summary of technology fuel consumption reduction and direct manufacturing cost input differences between U.S. EPA final determination and this analysis for 2025

	Fuel consumption and CO_2 reduction benefits[a]		Direct manufacturing cost (2015 $)[b]	
	U.S. EPA	ICCT	U.S. EPA	ICCT
Cylinder deactivation	3.5%-5.8%	No change	$75-$149	No change
Dynamic cylinder deactivation[c]	Not included	6.5%-8.3%	Not included	$138-$256
Direct injection[d]	1.5%	No change	$196-$356	$91-$185
Cooled exhaust gas recirculation	1.7%-5.3%	No change	$216	$95-$114
Advanced diesel	20.0%-25.2%	No change	$2,104-$2,950	$1,491-$2,096
E-boost	Not included	5.0%	Not included	$338
Mild hybrid (48-volt)	7.0%-9.5%	10.5%-12.9%	$580	No change
High compression ratio[e]	3.4%-7.7%	10.1%-14.1%	Varies	Varies
Miller cycle[f]	12.4%-20.3%	No change	Varies	$93-$222 lower
Plug-in hybrid electric vehicle[g]	65%-75%	No change	$5,534-$10,371	$3,564-$7,805
Battery electric vehicle[g]	71%-82%	No change	$5,131-$10,663	$2,410-$9,098
Mass reduction (20%)	11.2%-13.7%	11.6%-13.7%	$0.17-$1.15 per pound	No change

[a] *Shown as per mile reduction; benefits vary by vehicle type and engine size; improvements are shown for individual technology, effects are handled as applied with multiple technologies simultaneously in lumped parameter model*
[b] *Costs in 2015 dollars, ranges as shown because they vary by vehicle type and engine size*
[c] *Includes variable valve lift technology*
[d] *Direct injection technology without synergistic technologies such as cooled exhaust gas recirculation and turbocharging*
[e] *Includes Atkinson cycle, direct injection, and cooled exhaust gas recirculation*
[f] *Includes Atkinson cycle, 24 bar turbocharging, cooled exhaust gas recirculation, and engine downsizing; costs vary not only by vehicle type #1 through #6, but also with the base engine and camshaft configuration subject to downsizing*
[g] *Range shown for vehicle type #1 through #6, including low and high electric range and in-home charger; CO_2 emission reductions are based on U.S. EPA estimation of 2025 average U.S. grid emissions*

The second study, conducted by Ricardo Strategic Consulting under a multi-year contract with CARB, culminated in a report published on April 25, 2017. This report, *Advanced Strong*

[78] p. iv, available at: http://www.theicct.org/sites/default/files/publications/US-LDV-tech-potential_ICCT_white-paper_22032017.pdf, last visited August 18, 2017.

Hybrid and Plug-In Hybrid Engineering Evaluation and Cost Analysis, focused on advanced component costs. This study stated:

> The initial review of vehicle technologies provided insight into some common trends embedded into new designs across OEMs: Light weighting; Reduction of mechanical and electric losses; Part reduction by component integration; Limiting exposure to potential supply chain volatility in rare earth materials; efficient thermal management.... It became clear through preparing this report that innovation at the OEMs is continuing at a brisk pace, looking not only at discrete technical engineering solutions but also at broader commercial considerations.[79]

In addition to these new studies, comments submitted on NHTSA's request for comments on the scope of the environmental impact statement for its CAFE standards for MY 2022-2025[80] also support maintaining the current 2022-2025 model year greenhouse gas standards. The Manufacturers of Emission Controls Association (MECA) commented the current standards are a valid minimum threshold "and all alternatives analyzed in the EIS could be strengthened based on demonstrated higher adoption rates and new technology penetration that has been observed over the 2012-2017 timeframe compared to what was originally predicted." Specifically, the MECA comments state:

> Besides the already mentioned ICCT white paper, a number of leading edge technologies have been announced for commercialization in the U.S. before 2021, including dynamic cylinder deactivation, new high-efficient engines (e.g., Skyactiv-D and Skyactiv-X), and others. Some of these technologies, like 48V systems, have been already introduced on vehicles in Europe, with several manufacturers projecting broad implementation across their fleet in the near future. Our members expect announcements of 48V mild hybrid technology on vehicles for sale in the U.S. in the next few years, with significant penetration into the fleet by 2025 when the standards are fully implemented. The reason for such rapid acceptance of this technology, that was not even considered in NHTSA's 2012 analysis, is because it provides 50-70% of the fuel economy benefits of a full hybrid system at 30% of the cost. The simplest versions (P1, belt starter generator) can be easily integrated into a vehicle without a complete redesign, which would be needed for a full hybrid powertrain. MECA believes that light-duty diesel powertrains continue to provide a cost-effective, durable approach for vehicle manufacturers to improve the average fuel economy of their fleets, particularly in the larger power category that includes small pick-up trucks and SUVs. A 2016 analysis completed by the Martec Group provides an updated cost-benefit analysis for light-duty cars and trucks that details the costs and benefits of diesel powertrains as part

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[79] Steir, Al, Munday, Alan, *Advanced Strong Hybrid and Plug-In Hybrid Engineering Evaluation and Cost Analysis* (April 25, 2017), pp. XI-XII, available at: https://www.arb.ca.gov/msprog/acc/mtr/hybrid_phev_report_full.pdf, last visited August 17, 2017.

[80] NHTSA, Notice of Intent to Prepare an Environmental Impact Statement for Model Year 2022-2025 Corporate Average Fuel Economy Standards, Docket ID No. NHTSA-2017-0069.

> of a more fuel efficient light-duty fleet. Furthermore, MECA has provided input on the cost analysis in the diesel teardown study funded by EPA and conducted by FEV.[81]

The progress of the industry towards meeting the 2022–2025 fuel economy and greenhouse gas emission standards support maintaining or increasing the protectiveness of the program.

C. The Impact of the Standards on the Automobile Industry

Any consideration of the impact of the standards on the auto industry must also include the broader impacts to the businesses that supply components to the auto industry as well as to the workforce within the automobile industry. Automotive suppliers and labor groups recently commented to NHTSA on these matters. They described the negative impact of re-evaluating the appropriateness of the current national 2022 through 2025 model year greenhouse gas emission standards to committed investments and jobs for components needed in the current standard. Excerpts from some of these comments that are relevant to "the impact of the standards on the automobile industry" are as follows:

The Advanced Engine Systems Institute stated:

> As a trade association representing innovative manufacturers of emissions control and efficiency technology and products, we rely heavily on regulatory certainty to determine how and where to invest our resources. Our industry, now employing nearly 300,000 Americans in 48 states, exists in large part because the United States has adopted, enforces, and continues to refine in response to the best scientific information on pollution's impact on public health and environment, the most advanced clean car standards in the world. Those standards create a competitive advantage for US-developed vehicle technologies in a global marketplace where other countries are gradually importing our country's standards and thereby reducing conventional pollutants and greenhouse gases. If NHTSA seriously entertains selecting the "no action" alternative, the Administrator should be prepared to incorporate the resulting costs of the job losses and dis-investment that will occur in the U.S. when our standards no longer lead the world as part of calculating compliance with Executive Order 13783. Stagnating American vehicle standards are a recipe for declining international competitiveness of our manufacturing sector, decreased US investment and employment, and increased pollution here and abroad.[82]

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[81] *Comments of the Manufacturers of Emission Controls Association on the National Highway Traffic Safety Administration Notice of Intent to Prepare an Environmental Impact Statement for Model Year 2022–2025 Corporate Average Fuel Economy Standards*, internet citations omitted, available at: https://www.regulations.gov/contentStreamer?documentId=NHTSA-2017-0069-0086&attachmentNumber=1&contentType=pdf, last visited September 19, 2017.

[82] *Comments of the Advanced Engine Systems Institute on the National Highway Traffic Safety Administration's Notice of Intent to Prepare an Environmental Impact Statement for Model Year 2022–2025 Corporate Average Fuel Economy Standards*, available at: https://www.regulations.gov/contentStreamer?documentId=NHTSA-2017-0069-0087&attachmentNumber=1&contentType=pdf last visited September 19, 2017.

The Aluminum Association stated:

> To date, automakers and their suppliers have shown ongoing initiative in meeting or exceeding the required CAFE standards. The aluminum industry supply chain is committed to ongoing and further advances in the future to help their automaker customers meet regulatory fuel efficiency goals. Bottom line, adherence to the 'maximum feasible' criteria ensures continued innovation across the supply chain for advancing the cause of fuel-efficient vehicles....
>
> The notice indicates that NHTSA "may evaluate the Model Year 2021 standards to ensure they remain 'maximum feasible'". If NHTSA undertakes this evaluation, the Association asks that the full potential impact of this change on automobile manufacturers and suppliers be understood before making any changes. The Model Year 2021 standards have already been regulatorily [sic] finalized and any action taken to adjust these standards (either up or down) at this point would significantly increase uncertainty in the aluminum industry as well as for other suppliers to the auto and light truck market. As noted above, this regulatory uncertainty is exactly the opposite of what manufacturers and suppliers need to make long term investment decisions. Aluminum suppliers have made long term investment decisions based on the existing Model Year 2017 through 2021 standards set in the previous rulemaking. With an average of 5 years to take a major vehicle platform from concept to customer, many of the Model Year 2021 vehicle designs are nearing finalization. In particular, reducing the stringency of the Model Year 2021 standard could result in adverse environmental and economic impact, including loss of jobs, to the substantial long-term investment levels to which suppliers committed to in 2012 when the regulations up through 2021 were finalized. These investments include significant research and development, human capital, manufacturing facilities and equipment to satisfy auto manufacturing customer fuel efficiency regulatory requirements....
>
> [I]ncreases in the application of mass reduction technologies can help compensate for any shortfall caused by lower rates of adoption of other technologies, such as electrified vehicles and the aluminum industry is ready to provide assistance to help meet the overall CAFE program compliance goals....
>
> Given regulatory certainty via the implementation of 'maximum feasible' standards in the Model Year 2022-2025 standards, the economic benefit of these effects can be maximized. Currently, the US aluminum industry directly employs 161,000 workers and indirectly employs an additional 551,000 workers. Its economic output directly generates $75 billion and indirectly generates an additional $111 billion in economic output. In total, the U.S. aluminum industry supports nearly 713,000 jobs and $186 billion in economic output, more than 1 percent of Gross Domestic Product....

> Since 2013, the aluminum industry has announced U.S. plant expansions and planned investments totaling more than $2.3 billion to meet increasing automotive customer needs....
>
> Related, a recent study commissioned by the Aluminum Association noted that the projected increase in demand for aluminum sheet for use in automotive body and closure applications is expected to generate growth in the aluminum industry equal to approximately 6,322 American jobs by 2025.[83]

The National Coalition for Advanced Transportation stated:

> Advanced technology vehicles--including both vehicle and supply equipment manufacturing and development of supporting infrastructure--can help drive large-scale investment, economic growth and job creation across the United States. Federal and state vehicle standards play a critical role in supporting investment and unlocking the vast economic potential in this area. U.S. auto and technology manufacturers have made electric vehicles ("EVs") and other advanced technology vehicles a centerpiece of their business strategies and are backing those strategies with billions of dollars in investments. Substantial growth in jobs relating to the expansion of the EVs and other advanced technology vehicles is expected--including in vehicle manufacturing, charging and other "fueling" infrastructure, and maintenance and repair. In addition, the global market for electric vehicles and supporting technologies is expanding rapidly and projected to grow dramatically in the coming decades--presenting a major market opportunity for U.S. companies.[84]

The American Chemistry Council stated:

> Developing technology to allow for maximum fuel efficiency spurs advanced manufacturing innovations in the United States, creates jobs and helps increase U.S. energy independence. Automotive plastic products are produced at 1,572 plants located in 45 states. These plants directly employ about 57,425 people and feature a payroll of $2.8 billion. Michigan is the leading state in terms of direct employment (over 14,400) and is followed by Ohio (over 8,400), Indiana (over 6,200), Tennessee (about 3,910), Minnesota (nearly 3,050), Pennsylvania (about 2,775), Illinois (over 2,400), Wisconsin (nearly 2,200), New York (about 1,570), and North Carolina (about 1,520).

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[83] Letter dated August 25, 2017, RE: Docket ID No. NHTSA-2017-0069 – Notice of Intent to Prepare an Environmental Impact Statement for Model Year 2022-2025 Corporate Average Fuel Economy Standards, available at: https://www.regulations.gov/contentStreamer?documentId=NHTSA-2017-0069-0111&attachmentNumber=1&contentType=pdf last visited September 19, 2017. (Footnotes omitted for brevity).

[84] *Comments of the National Coalition for Advanced Transportation On NHTSA's Notice of Intent to Prepare an Environmental Impact Statement for Model Year 2022–2025 Corporate Average Fuel Economy Standards*, available at: https://www.regulations.gov/contentStreamer?documentId=NHTSA-2017-0069-0113&attachmentNumber=1&contentType=pdf last visited September 19, 2017.

> Producers of automotive plastics and polymer composites purchase plastic resins, additives, other materials, components and services. As a result, the contributions of plastics and polymer composites go well beyond their direct economic footprint. The automotive plastics and polymer composites industry fosters economic activity indirectly through supply-chain purchases and through the payrolls paid both by the industry itself and its suppliers. This, in turn, leads to induced economic output as well. As a result, it is estimated that every job in the automotive plastics and polymer composites industry generates an additional job elsewhere in the U.S. economy, for a total of over 108,000 jobs, representing 11.7% of the light vehicle industry workforce.[85]

Engineering and development of advanced technology vehicles, including electric drivetrains, can result in a net job growth in the United States, according to the International Economic Development Council. It is important that NHTSA consider these broader economic impact benefits in setting fuel economy standards.[86] National studies evaluating the economic impact from the fuel economy standards show net job growth as a result of the augural standards.[87] Net job growth is projected when taking a broader view of investments and innovation in new technologies from component suppliers as well as automobile manufacturers.

The current standards also have provided ample lead time. The regulatory stability of maintaining the standards ensures the necessary technology will be developed.

In sum, not only would relaxing the standards hurt the environment, the economy, and job growth, and suppress technological innovation, the specter of doing so creates a self-fulfilling prophecy. The automobile industry is global. To be competitive, manufacturers must be able to sell their products world-wide. U.S. standards that keep up with international standards help ensure domestic manufacturers can compete on the world stage. Europe and Asia are moving away from internal combustion engines.[88] The United States should not abandon its leadership role and facilitate wasteful and harmful over-consumption of petroleum-based fuels

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[85] Letter dated August 2017 "RE: Docket ID No. NHTSA-2017-0069 – Notice of Intent to Prepare an Environmental Impact Statement for Model Year 2022-2025 Corporate Average Fuel Economy Standards," available at: https://www.regulations.gov/contentStreamer?documentId=NHTSA-2017-0069-0077&attachmentNumber=1&contentType=pdf last visited September 19, 2017. (Footnotes omitted for brevity)
[86] *See Midterm Review Report*, *supra,* App. B, p. B-122.
[87] *See Ibid.,* App. B, p. B-124.
[88] *See*, e.g.: http://www.independent.co.uk/environment/france-petrol-diesel-ban-vehicles-cars-2040-a7826831.html [France]; https://www.nytimes.com/2017/07/26/world/europe/uk-diesel-petrol-emissions.html [United Kingdom]; https://www.cleanenergywire.org/news/merkel-open-combustion-engine-ban-onshore-wind-prices-drop/merkel-signals-support-eventual-ban-combustion-engine [Germany]; http://insideevs.com/china-considers-zev-mandate/ [China]; http://www.mddelcc.gouv.qc.ca/changementsclimatiques/vze/index-en.htm [Quebec]; http://www.newswire.ca/news-releases/government-of-canada-to-develop-a-national-zero-emissions-vehicle-strategy-by-2018-624609563.html [Canada]; http://wccftech.com/norway-electric-cars/; [Norway]; https://www.fastcompany.com/3058649/the-netherlands-will-ban-new-gasoline-powered-vehicles-by-2025 [Netherlands], last visited August 18, 2017.

when the rest of the world demands better. EPA and NHTSA should quickly affirm the current standards, so that progress will continue on improved technology for the betterment of all.

D. The EPA Cost Effectiveness Modeling Should be Used for Greenhouse Gas Rulemakings.

CARB is confident the EPA compliance cost effectiveness modeling used in the 2016 Draft TAR and their Proposed Determination is more robust than the modeling from NHTSA for the 2016 TAR, and strongly recommends the EPA modeling continue to be used for future greenhouse gas rule development. The following comments reflect how the EPA modeling is more robust both with regards to technology packages assumed, and with projection methodologies on how industry scales technologies and applies them to new platforms.

1. The EPA analysis considers a more realistic range of technology packages.

EPA includes a wider range of advanced conventional engine technology packages that have lower compliance costs compared to hybrids and electric vehicles, and provide more alternatives for the compliance model to choose from. These technology packages reflect the current leading technology in the industry and are examples of how manufacturers are not sitting idle with engine efficiency improvements in conventional vehicles.

EPA's modeling includes 48 Volt mild hybrid systems in a much more comprehensive fashion than NHTSA's modeling, and this technology is rapidly expanding in the market. EPA models include this technology with efficiency estimates based on demonstrated performance. Even given this demonstrated performance characterization, some commenters, notably ICCT, stated the assumptions for projected years were conservative given that 48V systems can be used in combination with other components to improve efficiency (for example 48V + electric boost systems). Combining technologies in this way can lead to similar costs but higher effectiveness.

A 48V vehicle architecture can enable many other accessory systems to be electrified instead of belt driven from the engine crankshaft improving efficiency, including power steering, power brakes, water pumps, radiator cooling, and air conditioning. Proponents of this technology claim this provides two-thirds the efficiency improvement of a full hybrid at one-third the cost.[89] At higher voltages, automakers can install more powerful starter motors without redesigning the vehicle's architecture or manufacturing process. It may also be possible to update some vehicles with 48V systems as a mid-cycle change on an existing platform, without having to wait for the full platform redesign.

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[89] Bill Howard, Extreme Tech. *Why Cars Are Moving to 48-Volt Electrical Systems*, (April 26, 2017), available at: https://www.extremetech.com/extreme/247889-cars-moving-48-volt-electrical-systems, last visited September 27, 2017.

As evident from product announcements at the Frankfurt Motor Show in September 2017, many automakers are bringing 48V systems on gasoline engines to market soon as an alternative to diesel engines, including the next gen VW Golf in 2019. Major suppliers like Bosch, Valeo, and Delphi have systems in production, and Delphi predicts that one out of every 10 cars sold globally by 2025 will be a 48V mild hybrid.

Another promising technology entering the market was not even included in the NHTSA compliance modeling. The "Atkinson 2" engine technology was used by EPA in advanced powertrain technology packages to consider cylinder deactivation. Notably Mazda has had this type of engine (SKYACTIV-G) in production for several model years. When EPA applied this technology in the compliance models, the effectiveness improvement was between 20% and 23% depending on vehicles with varying power-to-weight ratios. This is a significant improvement. Refer to chapter 2.3.3.2 of the Technical Support Document for the Proposed Determination[90] for details.

2. The EPA analysis supporting the current standards considers more realistic projection methodologies.

EPA also incorporates more accurate projection methodologies for how often vehicle platforms are redesigned. EPA assumes a 5 year redesign cycle, whereas NHTSA assumes a 6-7 year cycle. EPA's approach more accurately reflects what manufacturers do today, particularly as they respond to an ever faster paced market with growing competition. This is an important distinction in the fleet compliance modeling because a longer product cycle means new technology will take longer to penetrate the market in compliance simulations, reducing the potential for effectiveness improvements.

A description of the EPA assumptions can be found in the 2016 TAR on pages 12-7 to 12-10.

> We continue to estimate a 5 year redesign cycle.[91] This cycle is consistent with our understanding of industry practice (although there are indications that cycles are becoming shorter due to competitive pressures, especially on cars)… We know that industry plans ahead for compliance with future standards and carefully considers their redesign cycles when developing their compliance plans.

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[90] *Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation: Technical Support Document* (November 2016, EPA-420-R-16-021), available at: https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2015-0827-5941&contentType=pdf.

[91] Use of a 5-year redesign cycle is consistent with that assumed by the National Academies of Science. National Research Council. 2015. *Cost, Effectiveness, and Deployment of Fuel Economy Technologies for Light-Duty Vehicles*. Washington, DC: The National Academies Press. https://doi.org/10.17226/21744. (p. 342) "Opportunities for a manufacturer to bank and borrow credits over time will allow that manufacturer to better match product redesign cycles that are usually between 3 and 5 years, with the standard increasing in stringency every year."

A description of the NHTSA assumptions can be found in the 2016 TAR on pages 13-6 to 13-8.

> NHTSA's simulation of compliance actions that manufacturers might take is constrained by the pace at which new technologies can be applied in the new vehicle market. Operating at the make/model level (e.g. Toyota Camry) allows NHTSA to explicitly account for the fact that individual vehicle models undergo significant redesigns relatively infrequently. Many popular models are only redesigned every six years or so, with some larger legacy platforms stretching more than a decade between significant redesigns.

In addition to the product redesign cycle, EPA includes a "power-to-weight" ratio adjustment that is applied to technology packages to scale them for varying size vehicles. This allows a more detailed - and likely more accurate - scaling of technologies onto larger vehicle platforms instead of a simplistic assumption that one technology works on all vehicle classifications.

Vehicles with a higher power-to-weight ratio will typically result in a higher effectiveness for a given package of technologies. As cited by ACEEE in their Final Determination comments to EPA,

> EPA undertook substantial additional analysis... In order to capture variations in powertrain technology effectiveness, EPA i) altered its vehicle classification to reflect variations in power-to-weight ratio and road lower power and ii) used a power-to-weight correction factor within each class to adjust the effectiveness values produced by the lumped parameter model (LPM) before those values were input to OMEGA.[92]

Finally, in its 2015 report evaluating the national agencies' rulemaking analysis, the National Academies of Science noted the EPA's methodology was robust.[93] It noted the lumped parameter model methodology should be continued for future analysis and rulemakings.[94]

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[92] *See* EPA, *Final Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation Response to Comments*, EPA-420-R-17-002 (January 2017), p. 27.

[93] National Research Council. 2015. *Cost, Effectiveness, and Deployment of Fuel Economy Technologies for Light-Duty Vehicles*. Washington, DC: The National Academies Press. https://doi.org/10.17226/21744. (p. 2) "The committee found the analysis conducted by NHTSA and EPA in their development of the 2017-2025 standards to be thorough and of high caliber on the whole. In particular, the committee notes that the use of full vehicle simulation modeling in combination with lumped parameter modeling has improved the Agencies' estimation of fuel economy impacts."

[94] National Research Council. 2015. *Cost, Effectiveness, and Deployment of Fuel Economy Technologies for Light-Duty Vehicles*. Washington, DC: The National Academies Press. https://doi.org/10.17226/21744. (p. 3) "Further, the committee notes that the use of full vehicle simulation modeling in combination

IV. EPA Should Maintain the Current National Harmonized Program.

The current program should remain at the current stringency or be strengthened preserve the expected health, environmental, and societal benefits. A harmonized program reduces development costs for automakers as the technology needed for compliance with greenhouse gas standards is similar to that for Corporate Average Fuel Economy standards. The technologies and vehicle products developed to comply with one facilitate compliance with the other when both programs are strong and encourage innovation.

The current standards are consistent with energy independence and economic growth, including the relevant aspects of Executive Order No. 13783 of March 28, 2017. They promote clean air.[95] They save money for consumers, providing a greater benefit than cost.[96] They are cost-effective within the expected ownership of the original purchaser, and will increase the resale value for the original purchaser as they will save money for every driver over the vehicle's life. They are based on the best available peer-reviewed science and economics, developed through a transparent process.[97]

A harmonized national program makes dollars and cents for consumers while protecting their health and the world in which they live. The distributional consequences of the current standards on households are positive and support equity. Simply weakening the stringency of the standards will not necessarily translate into lower vehicle costs to consumers. Fuel savings over the full life of the vehicle will exceed the incremental vehicle costs. As noted above, EPA concluded and confirmed in the Final Determination that the net lifetime consumer savings for an "average" MY 2025 vehicle compared to the MY 2021 greenhouse gas standards will be $1,650. While only a portion of the driving population purchases new vehicles, these purchases eventually dictate which vehicles are sold to second owners in the used car market. Consequently, buyers of used vehicles will also benefit from lifetime fuel savings of more efficient vehicles. As a result, lower-income families that purchase used vehicles will benefit from the fuel savings of vehicles developed to comply with the current standards. This will provide more discretionary income to be re-invested in the economy. The economic benefits of the current national greenhouse gas emission standards to consumers have won them the support of the consumer advocacy groups Consumer Federation of America and Consumers Union as summarized below.

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with lumped parameter modeling and teardown studies contributed substantially to the value of the Agencies' estimates of fuel consumption and costs, and it recommends they continue to increase the use of these methods to improve their analysis. The committee recognizes that such methods are expensive but believes that the added cost is well justified because it produces more reliable assessments (Recommendation 8.3)."

[95] *See* Exec. Order No. 13783, § 1.(d).

[96] *See* Exec. Order No. 13783, § 1.(e).

[97] *See* Exec. Order No. 13783, § 1.(e).

At the September 22, 2016 congressional hearing "Midterm Review and Update on the Corporate Average Fuel Economy Program and Greenhouse Gas Emissions Standards for Motor Vehicles" held by the Energy and Commerce Committee, Dr. Mark Cooper, Director of Research, Consumer Federation of America, discussed the benefits of the national greenhouse gas emission standards to consumers in his testimony,[98] stated:

> Under the base case, consumers are the big winners with total benefits in our view over five times the cost. Three-fifths of those benefits are direct consumer pocketbook benefits because the total cost of driving goes down.
>
> Second, low-income consumers benefit more than the average consumer because operating costs of vehicles are much more important in their total cost of driving than ownership cost. They buy used vehicles. And those used vehicles, it turns out, get a disproportionate share of the benefits of fuel savings because they are not fully captured in the resale price. They get the benefit of the second half of the life of the vehicle.
>
> And third, let's be clear. Low-income people suffer the most from environmental and pollution harm that results when we drive dirty cars. They suffer the most. They benefit the most from the indirect effects.

Per Executive Order 12898, as well as Title VI of the Civil Rights Act, NHTSA must also consider how the impacts of weakened CAFE standards impacts will be especially burdensome to disadvantaged communities.[99]

According to the Consumers Union,

> lowering fuel costs for new and used vehicle buyers alike [from] fuel economy standards actually deliver[s] higher-than-average net benefits to low- and moderate-income households.
>
> Based on these demographic vehicle buying trends, the main impacts of fuel economy standards would be felt in the used vehicle market. Fortunately, while the new vehicle market has tracked slightly above inflation over the last two decades, used vehicles have actually become cheaper, even as they have benefited from fleet-wide improvements to safety, fuel economy, performance, and other attributes. Fuel

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[98] Midterm Review and Update on the Corporate Average Fuel Economy Program and Greenhouse Gas Emissions Standards For Motor Vehicles, Hearings before the House Com. On Energy and Commerce, Subcom. on Commerce, Manufacturing, and Trade, 114th Cong., 2d Sess. (2016), testimony of Dr. Mark Cooper, Director of Research, Consumer Federation of America, Preliminary Tr., pp. 122-123, available at: http://docs.house.gov/meetings/IF/IF17/20160922/105350/HHRG-114-IF17-Transcript-20160922.pdf, last visited September 19, 2017.

[99] *See*, e.g., *Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations*, Exec. Order No. 12898, 59 Fed.Reg. 7629 (Feb. 11, 1994), as amended, 60 Fed.Reg. 6381 (January 30, 1995.)

> economy in particular has been improving since 2012, and both new and used vehicle sales have been at or near record highs. However, there has been only a small increase in real new vehicle prices (largely driven by a trend toward larger vehicles), and there has been a small decrease in real used car prices since that time.[100]

In sum, the evidence supports the current standards.

V. Weakening the Current Standards Must Meet Substantive and Procedural Legal Requirements – But the Evidence Does Not Meet the Requirements.

Were EPA or NHTSA to weaken the standards, they would have to conduct notice-and-comment rulemaking, and consider the implications under other protective statutes.

As required by law, any changes to the greenhouse gas emission standards in effect through and beyond MY 2025 must be made following the requirements for administrative rulemaking.[101] NHTSA has similarly acknowledged it will conduct formal rulemaking proceedings to codify the CAFE standards for MY 2022-2025. Any changes to the CAFE standards for MY 2021 must similarly be made through formal rulemaking. If a reconsidered Final Determination reached conclusions supporting a decision to propose weakened standards, the reason and basis of that reconsidered conclusion, including the revised Final Determination, would likewise be subject to notice and comment.

EPA and NHTSA must also fully identify and assess any detrimental impacts of proposed regulatory changes under various protective statutes. These include the National Environmental Policy Act (NEPA) (for NHTSA), the Endangered Species Act (ESA), and the National Historic Preservation Act (NHPA).

NEPA requires that for every major proposed federal action significantly affecting the quality of the human environment, agencies must prepare a detailed statement outlining the environmental impact of the proposed action. A "major" federal action is any action that requires substantial planning, time, resources, or expenditure.[102] Regulations are included.[103] Amending the CAFE standards involve significant research and analysis. It would be a major federal action. A federal action "significantly affects" the environment if it may significantly degrade some human environmental factor.[104] Relaxing the national fuel economy standards

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[100] Letter to EPA dated December 23, 2016 "Re: Consumers Union's Comments on EPA's Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation (Docket ID No. EPA-HQ-OAR-2015-0827), available at: https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2015-0827-6028&attachmentNumber=1&contentType=pdf last visited September 19, 2017.
[101] 40 C.F.R. § 86.1818-12(h).
[102] *Natural Resources Defense Council, Inc. v. Grant*, (E.D. N.C. 1972) 341 F.Supp. 356.
[103] 40 C.F.R. § 1508.18(b); but EPA's actions under the Clean Air Act are exempt from NEPA, under the Energy Supply and Environmental Coordination Act of 1974, at 15 U.S.C. § 793(c)(1).
[104] *Columbia Basin Land Protection Ass'n v. Schlesinger* (9th Cir.1981) 643 F.2d 585.

would have significant adverse environmental effects. Before acting, an administrative agency must inquire into the potential environmental impacts of its decisions.[105]

Under the ESA, NHTSA and EPA must consider the potential impacts of any proposed relaxed standards, and resulting pollution from motor vehicle fuel extraction, refining, and consumption on threatened and endangered species and critical habitats.[106] These impacts are sweeping, critical, and potentially dispositive, as relaxing the standards would significantly exacerbate the climate change risks faced by these species.

If a revised Final Determination concludes the federal emission and fuel economy standards should be relaxed, EPA and NHTSA would have to consider the potential impacts on archaeological sites and other historical resources, under the National Historic Preservation Act.[107] These resources are, in many instances, profoundly threatened by climate change. Prior to the approval of any Federal undertaking that may directly and adversely affect any National Historic Landmark, the head of the responsible Federal agency shall to the maximum extent possible undertake such planning and actions as may be necessary to minimize harm to the landmark. The head of the Federal agency shall afford the Council a reasonable opportunity to comment with regard to the undertaking.[108] If the standards were relaxed, this could lead to additional domestic petroleum wells to meet the increased demand for gasoline and diesel fuel. Before relaxing the federal standards, EPA and NHTSA must, for instance, assess whether additional wells would impact archaeological and other relevant sites.[109] More broadly, the agencies must consider how exacerbating climate change may affect these resources.

VI. If EPA and NHTSA Reach a Different Conclusion then a Proposed Final Determination Should be Made Available for Comment.

Should EPA and NHTSA reach a different conclusion, transparency supports following the previous course by issuing a proposed determination to allow for public comment. Any proposed new Final Determination should make available for comment the agencies' assessment of the factors and evidence it considered before initiating a rulemaking. An open process is warranted given the gravity of the decision.

VII. Conclusion

The science and engineering analyses supporting the midterm evaluation of the national greenhouse gas emission standards and established and augural CAFE standards set out to

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[105] *Calvert Cliffs Coordinating Committee v. Atomic Energy Comm'n* (D.C. Cir. 1971) 449 F.2d 1109.
[106] 16 U.S.C. § 1531, et seq.
[107] 54 U.S.C. § 300101, et seq.
[108] 54 U.S.C. § 306107.
[109] 54 U.S.C. § 306102(b)(3).

2025 are thorough and sound. Any downwards departure from those standards would be arbitrary and capricious. We urge EPA and NHTSA to work collectively and responsibly in maintaining these standards, and moving forward with strong future standards.

Index to

**Comments of the California Air Resources Board
and the
Attorney General of California**

Responding to

**The United States Environmental Protection Agency
and the
National Highway Traffic Safety Administration's**

Requests for Comment on Reconsideration of the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emissions Standards for Model Years 2022-2025 Light-Duty Vehicles, and on Model Year 2021 Greenhouse Gas Emissions Standards

**Docket Nos.
EPA-HQ-OAR-2015-0827 and NHTSA-2016-0068**

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2, 2	5	CARB Resolution 12-35
2, 4	33:11	U.S. Global Change Research Program Climate Science Special Report, Fifth-Order Draft
3, 5	Full Document	U.S. Greenhouse Gas Inventory Report: 1990-2014
3, 6	Full Document	California Greenhouse Gas Emission Inventory
8, 14	Full Document	Interim Joint Technical Assessment Report
9, 18	4	CARB Resolution 12-35
9, 19	3	CARB Resolution 12-21
9, 23	Full Document	CARB, Compilation of Section 177 States
10, 24	9880–9902	• Global and regional aspects of tropical cyclone activity in the

	157-163 6591-6617 7203-7224 L24706	CMIP5 models** • Tropical cyclones and climate change** • Dynamical downscaling projections of twenty-first-century Atlantic hurricane activity: CMIP3 and CMIP5 model-based scenarios** • Global projections of intense tropical cyclone activity for the late twenty-first century from dynamical downscaling of CMIP5/RCP4.5 scenarios** • Recent increases in U.S. heavy precipitation associated with tropical cyclones**
11, 24	997-1017 66-85	• Hurricanes and climate: The U.S. CLIVAR Working Group on Hurricanes** • Quantifying the effects of long-term climate change on tropical cyclone rainfall using a cloud-resolving model: Examples of two landfall typhoons in Taiwan**
11, 25	Full Documents	• Hurricane Irma claimed 31 U.S. lives among 69 total, and caused an estimated $55 billion in damages, as of September 14, 2017** • Hurricane Harvey claimed 63 U.S. lives, as of September 14, 2017** • How Hurricane Harvey's cost stacks up against past disasters**
11, 27	153-196	Assessment of Climate Change in the Southwest United States
11, 28	3838-3855	Detection and attribution of streamflow timing changes to climate change in the western United States**
11, 29	6425-6444	Attribution of declining western US snowpack to human effects.**
11, 30	1-26	Cross-system comparisons elucidate disturbance complexities and generalities**
12, 31	601-647	Coastal impacts due to sea-level rise**
12, 32	445-463	Climate change and growth scenarios for California wildfire**
12, 33	1024-1026	Rapid range shifts of species associated with high levels of climate warming**
12, 34	465-473	Biodiversity in a changing climate: A synthesis of current and projected trends in the US. Frontiers in Ecology and the Environment**

12, 35	296	Impacts of Climate Change on Biodiversity, Ecosystems, and Ecosystem Services.
12, 36	14175–14180	Flow regime, temperature, and biotic interactions drive differential declines of trout species under climate change**
12, 37	235-251	Projecting global marine biodiversity impacts under climate change scenarios**
12, 38	e6825	Re-shuffling of species with climate disruption: A no-analog future for California birds?
13, 39	1855-1872	Climate change increases risk of plant invasion in the Eastern United States**
13, 40	501-517	Cross-scale drivers of natural disturbances prone to anthropogenic amplification: The dynamics of bark beetle eruptions**
13, 41	369-377	Costs and losses imposed on California ranchers by yellow starthistle**
13, 42	1887-1894	Strong response of an invasive plant species (Centaurea solstitialis L.) to global environmental changes**
13, 43	189	Global Climate Change Impacts in the United States: The Third National Climate Assessment**
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13, 45	461-472	Reconstructing sea level from paleo and projected temperatures 200 to 2100 AD**
13, 46	80-81, 14-20	Sea level projections to AD 2500 with a new generation of climate change scenarios**
13, 47	044035	Comparing climate projections to observations up to 2011**
13, 48	21527-21532	Global sea level linked to global temperature**
14, 49	2-3	Midterm Evaluation of Emission Standards for Passenger Cars and Light Duty Trucks for Model Years 2022-25

14, 50	Full Document	Draft Technical Assessment Report
14, 52	Full Document	Final Environmental Impact Statement Summary July 2012 from National Highway Transportation Safety Association
15, 54	Full Document	Staff Report: Initial Statement of Reasons for Proposed Rulemaking; Public Hearing to Consider the "LEV III" Amendments to the California Greenhouse Gas and Criteria Pollutant Exhaust and Evaporative Emission Standards and Test Procedures and to the On-Board Diagnostic System Requirements for Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, and to the Evaporative Emission Requirements for Heavy-Duty Vehicles (LEV III ISOR)
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15, 56	ES-2, ES-12	Draft Technical Assessment Report
15, 57	7	Final Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation
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17, 60	ES-3	California Advanced Clean Cars Midterm Review, Summary Report for the Technical Analysis of the Light-Duty Vehicles Standards, with Appendices (California Midterm Review)
17, 61	Full Document	Greenhouse Gas Emission Standards for Light-Duty Vehicles: Manufacturer Performance Report for the 2014 Model Year
19, 71	Full Document	CARB Advanced Clean Cars Symposium-The Road Ahead
19, 72	Full Document	GHG Reducing Advancements and Technologies**

19, 73	Full Document	Introduction of Variable Compression Turbo Engine**
20, 74	Full Document	Mazda SKYACTIV-G Engine with New Boosting Technology**
20, 75	Full Document	Mazda Announces Long-Term Vision for Technology Development, 'Sustainable Zoom-Zoom 2030'**
20, 76	Full Document	Mazda's 2019 Breakthrough: a Diesel Engine That Runs on Gasoline**
20, 77	Full Document	Tula Technology's Dynamic Skip Fire**
21, 78	iv	Efficiency Technology and Cost Assessment for U.S. 2025–2030 light-duty vehicles**
22, 79	XI-XII	Advanced Strong Hybrid and Plug-In Hybrid Engineering Evaluation and Cost Analysis
23, 81	Full Document	Comments of the Manufacturers of Emission Controls Association on the National Highway Traffic Safety Administration Notice of Intent to Prepare an Environmental Impact Statement for Model Year 2022–2025 Corporate Average Fuel Economy Standards
23, 82	Full Document	Comments of the Advanced Engine Systems Institute on the National Highway Traffic Safety Administration's Notice of Intent to Prepare an Environmental Impact Statement for Model Year 2022–2025 Corporate Average Fuel Economy Standards
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26, 86	B-122	California Midterm Review
26, 88	Full Documents	• France will "ban all petrol and diesel vehicles by2040"** • Britain to Ban New Diesel and Gas Cars by 2040** • Merkel signals support for eventual ban of combustion engine** • China Considers ZEV Mandate Similar To California** • Zero-emission vehicles (ZEV) standard** • Government of Canada to develop a national Zero-Emissions Vehicle Strategy by 2018** • All Cars In Norway Will Be 100% Electric By 2025** • The Netherlands Will Ban New Gasoline-Powered Vehicles By 2025**
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28, 90	Full Document	Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emission Standards Under the Midterm Evaluation
28, 91	342	Cost, Effectiveness, and Deployment of Fuel Economy Technologies for Light-Duty Vehicles**
29, 92	27	Final Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation
29, 93	2	Cost, Effectiveness, and Deployment of Fuel Economy Technologies for Light-Duty Vehicles**
29, 94	3	Cost, Effectiveness, and Deployment of Fuel Economy Technologies for Light-Duty Vehicles**
31, 98	122-123	Hearings before the House Com. On Energy and Commerce
32, 100	Full Document	Comments from the Consumers Union Comments on National Highway Traffic Safety Administration's Notice of Intent to Prepare an Environmental Impact Statement for Model Year 2022–2025 Corporate Average Fuel Economy Standards

* Although specific pages are listed, the entire document is relevant to NHTSA's consideration.
** Material subject to copyright and not submitted with comment

Appointment

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 1/23/2018 2:53:15 PM
To: Grundler, Christopher [grundler.christopher@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Burch, Julia [Burch.Julia@epa.gov]; Charmley, William [charmley.william@epa.gov]; Moran, Robin [moran.robin@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Simon, Karl [Simon.Karl@epa.gov]
CC: Alson, Jeff [alson.jeff@epa.gov]

Subject: Meet with Toyota re: MidTerm Review (MTR) for autos/light duty trucks (Confirmed)
Attachments: RE: Meeting Requests for Toyota ; FW: Meeting Requests for Toyota from S. Fotis; Confirmed 12/15 at 3pm: Meeting Requests for Toyota from S. Fotis; Confirmed 1/23/18 at 10am: Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis; RE: Rescheduling Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis
Location: WJC-N 5400 + Video with AA + Dial: Ex. 6 Personal Privacy (PP)

Start: 1/23/2018 4:00:00 PM
End: 1/23/2018 4:45:00 PM
Show Time As: Tentative

To: Bill Wehrum, Chris Grundler, Ben Hengst, Julia Burch, Bill Charmley, Robin Moran, Mike Olechiw and Karl Simon
Outside Attendees (in person):

- Tom Stricker, Vice President, Technical and Regulatory Affairs, Toyota
- Fred Turatti, General Manager, Toyota Motor North America
- Rick Gezelle, Manager, Technical and Regulatory Affairs
- Andrea Campbell, Van Ness Feldman, legal counsel for Toyota

RE: Meeting Requests for Toy... | FW: Meeting Requests for Toy... | Confirmed 12/15 at 3pm: Meeting Re... | Confirmed 1/23/18 at 10am: Meetin... | RE: Rescheduling Meeting with US...

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 11/30/2017 9:35:51 PM
To: Stephen Fotis [scf@vnf.com]
CC: Loving, Shanita [Loving.Shanita@epa.gov]
Subject: Confirmed 12/15 at 3pm: Meeting Requests for Toyota from S. Fotis

Hi Stephen,

You are confirmed for a 45 minute in person meeting on Friday, December 15, 2017 at 3:00pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.
Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Thursday, November 30, 2017 4:27 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Meeting Requests for Toyota from S. Fotis

Emily - Friday, December 15, 2017 at 3:00 PM works for Toyota. I will get back to you shortly with the names and titles of those individuals who will be attending the meeting with Bill on behalf of Toyota.
Again, many thanks for all of your assistance here.

Have a great rest of the day.
Best,
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP
scf@vnf.com
(202) 298-1908

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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Thursday, November 30, 2017 3:43 PM
To: Stephen Fotis
Cc: Loving, Shanita
Subject: FW: Meeting Requests for Toyota from S. Fotis

Hi Stephen,

It looks like Bill Wehrum could be available for a 45 minute in person meeting on Friday, December 15, 2017 at 3:00pm with Toyota.

Please advise if this could work on your end.

Thank you.
Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Wednesday, November 29, 2017 12:37 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

Thank you Emily for your assistance.
Best,
Stephen

Stephen Fotis
Partner
Van Ness Feldman LLP

scf@vnf.com
(202) 298-1908

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From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, November 29, 2017 11:51 AM
To: Stephen Fotis
Subject: RE: Meeting Requests for Toyota and Shell

Hi Stephen,

We are reviewing scheduling options now and will get back to you shortly.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Tuesday, November 28, 2017 5:32 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

Hi Emily – As suggested by Bill in his email below, I am following up with you regarding the scheduling of two separate meetings with Bill – one with Toyota on the Mid Term Review (MTR) for autos/light duty trucks, and the other with Shell on the OOOOa NSPS reconsideration rulemaking. Could you please advise me as to possible times that we might schedule these meetings? If possible, I'd like to try to schedule meetings for later this December before the holidays. Many thanks for your assistance.
Stephen

Stephen Fotis
Partner
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scf@vnf.com
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From: Wehrum, Bill [mailto:Wehrum.Bill@epa.gov]
Sent: Monday, November 27, 2017 12:29 PM
To: Stephen Fotis

Cc: Atkinson, Emily
Subject: RE: Meeting Requests for Toyota and Shell

Thanks Stephen. I'm copying Emily Atkinson. She can work with you to find times.

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Monday, November 27, 2017 11:29 AM
To: Wehrum, Bill <Wehrum.Bill@epa.gov>; Wehrum, Bill <Wehrum.Bill@epa.gov>
Subject: Meeting Requests for Toyota and Shell

Bill – I hope that you had a good Thanksgiving and had some time to relax. As a follow-up to our discussions of last week, both Toyota and Shell are happy to accommodate your request and delay their meetings until later this December or early January. However, I would like to see if we can schedule the meeting time for each now given that your calendar will no doubt be filling up quickly and the issues both want to raise are time sensitive.
Would it be appropriate for me to follow-up with Shanita or someone else on scheduling meeting dates?
Best,
Stephen

Stephen Fotis
Partner
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From: Stephen Fotis
Sent: Wednesday, November 22, 2017 2:46 PM
To: wehrum.bill@epa.gov; wehrum.william@epa.gov
Subject: Follow-up to Your Message on Meeting Requests

Bill – Many thanks for your call last night regarding my two meeting requests. I am now checking with the client in each case but will most likely not be getting back to you with answer until after the Thanksgiving holiday. However, I would be very surprised if there is anything compelling or urgent that would require scheduling either one of the meetings over the next few weeks.
Have a great Thanksgiving and I will be getting back to you next week.
Best,
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Stephen Fotis
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Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 11/30/2017 8:42:58 PM
To: scf@vnf.com
CC: Loving, Shanita [Loving.Shanita@epa.gov]
Subject: FW: Meeting Requests for Toyota from S. Fotis

Hi Stephen,

It looks like Bill Wehrum could be available for a 45 minute in person meeting on Friday, December 15, 2017 at 3:00pm with Toyota.

Please advise if this could work on your end.

Thank you.
Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

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To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

Thank you Emily for your assistance.
Best,
Stephen

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scf@vnf.com
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Immediate Office of the Assistant Administrator
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Email: atkinson.emily@epa.gov

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To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Requests for Toyota and Shell

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From: Wehrum, Bill [mailto:Wehrum.Bill@epa.gov]
Sent: Monday, November 27, 2017 12:29 PM
To: Stephen Fotis
Cc: Atkinson, Emily
Subject: RE: Meeting Requests for Toyota and Shell

Thanks Stephen. I'm copying Emily Atkinson. She can work with you to find times.

From: Stephen Fotis [mailto:scf@vnf.com]
Sent: Monday, November 27, 2017 11:29 AM
To: Wehrum, Bill <Wehrum.Bill@epa.gov>; Wehrum, Bill <Wehrum.Bill@epa.gov>
Subject: Meeting Requests for Toyota and Shell

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or early January. However, I would like to see if we can schedule the meeting time for each now given that your calendar will no doubt be filling up quickly and the issues both want to raise are time sensitive.
Would it be appropriate for me to follow-up with Shanita or someone else on scheduling meeting dates?
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From: Stephen Fotis
Sent: Wednesday, November 22, 2017 2:46 PM
To: wehrum.bill@epa.gov; wehrum.william@epa.gov
Subject: Follow-up to Your Message on Meeting Requests

Bill – Many thanks for your call last night regarding my two meeting requests. I am now checking with the client in each case but will most likely not be getting back to you with answer until after the Thanksgiving holiday. However, I would be very surprised if there is anything compelling or urgent that would require scheduling either one of the meetings over the next few weeks.
Have a great Thanksgiving and I will be getting back to you next week.
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Stephen

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Appointment

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/5/2018 2:34:17 PM
To: Grundler, Christopher [grundler.christopher@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Charmley, William [charmley.william@epa.gov]; Simon, Karl [Simon.Karl@epa.gov]; Moran, Robin [moran.robin@epa.gov]

Subject: Meet with Motor & Equipment Manufacturers Association (Confirmed)
Attachments: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards ; Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards ; Auto Suppliers Meeting on the Midterm Evaluation for Vehicle GHG Standards
Location: WJC-N 5400 + Video with AA + Dial Ex. 6 Personal Privacy (PP)

Start: 2/5/2018 9:15:00 PM
End: 2/5/2018 10:00:00 PM
Show Time As: Tentative

Re: Midterm Evaluation for Vehicle GHG Standards
To: Bill Wehrum, Chris Grundler, Ben Hengst
Cc: Mandy Gunasekara
Outside Attendees (in person):

1. Laurie Holmes, MEMA
2. Catherine Boland, MEMA
3. Dave Cetola, Johnson Matthey
4. Greg Garr, Umicore
5. Mike Belwood, Arconic
6. Tim Lynch, Morgan Lewis
7. Jennifer Heckmann, DENSO
8. Ana Meuweissen, Bosch
9. Erika Nielson, BW
10. Andrew Kenny, Magna

Confirmed 2/5 at 4:15pm: Auto Su... | Confirmed 2/5 at 4:15pm: Auto Su... | Auto Suppliers Meeting on the ...

Message

From: Simon, Karl [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=4D781D1AD595415DB3A4E768C2D2B3FC-SIMON, KARL]
Sent: 3/13/2018 3:27:20 PM
To: Rich Kassel [rkassel@capalino.com]
Subject: Re: April 4 and MTR

Sure. 12:30 or 5 seems open in an otherwise crowded schedule

> On Mar 13, 2018, at 11:15 AM, Rich Kassel <rkassel@capalino.com> wrote:
>
> Hi Karl -
>
> Can I call you today to talk more about the April 4 meeting and also a few minutes on the midterm review?
>
> Thanks,
> Rich
>
> Sent from my iPhone

Appointment

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 1/18/2018 4:10:24 PM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]
CC: Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Charmley, William [charmley.william@epa.gov]; Simon, Karl [Simon.Karl@epa.gov]; Moran, Robin [moran.robin@epa.gov]

Subject: Meet with Motor & Equipment Manufacturers Association (Confirmed)
Attachments: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards ; Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards ; Auto Suppliers Meeting on the Midterm Evaluation for Vehicle GHG Standards
Location: WJC-N 5400 + Video with AA + Dial Ex. 6 Personal Privacy (PP)

Start: 2/5/2018 9:15:00 PM
End: 2/5/2018 10:00:00 PM
Show Time As: Busy

Re: Midterm Evaluation for Vehicle GHG Standards
To: Bill Wehrum, Chris Grundler, Ben Hengst
Cc: Mandy Gunasekara
Outside Attendees (in person):

1. Laurie Holmes, MEMA
2. Catherine Boland, MEMA
3. Dave Cetola, Johnson Matthey
4. Greg Garr, Umicore
5. Mike Belwood, Arconic
6. Tim Lynch, Morgan Lewis
7. Jennifer Heckmann, DENSO
8. Ana Meuweissen, Bosch
9. Erika Nielson, BW
10. Andrew Kenny, Magna

Confirmed 2/5 at 4:15pm: Auto Su... | Confirmed 2/5 at 4:15pm: Auto Su... | Auto Suppliers Meeting on the ...

Message

From: Laurie Holmes [lholmes@mema.org]
Sent: 2/1/2018 2:38:05 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]
CC: Lewis, Josh [Lewis.Josh@epa.gov]
Subject: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Emily,
As requested, below is a list of participants for the meeting with Mr. Wehrum at 4:15 on Monday, February 5.
Thank you so much for your assistance in setting up this meeting.

Attendees:

1. Laurie Holmes, MEMA
2. Catherine Boland, MEMA
3. Dave Cetola, Johnson Matthey
4. Greg Garr, Umicore
5. Mike Belwood, Arconic
6. Joseph Fengler, Honeywell
7. Jennifer Heckmann, DENSO
8. Ana Meuweissen, Bosch
9. Erika Nielson, BW
10. Andrew Kenny, Magna

Best,
Laurie

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Thursday, January 18, 2018 3:44 PM
To: Laurie Holmes <lholmes@mema.org>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Laurie,
You are confirmed for a 45 minute in person meeting on Monday, February 5, 2018 at 4:15pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering

the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.

Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information. And based on the size of the room we plan to use, you should plan to bring no more than 10 attendees to this meeting.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Thursday, January 18, 2018 3:08 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Emily,
Yes, Mon. Feb. 5 at 4:15 will work for us.

Is there a number limit for the room? We will have some members with us.

Best,
Laurie

Sent from my iPhone

On Jan 18, 2018, at 11:08 AM, Atkinson, Emily <Atkinson.Emily@epa.gov> wrote:

> Hi Laurie,
>
> It looks like Bill Wehrum could be available for a 45 minute in person meeting on Monday, February 5 at 4:15pm.
>
> Please advise if this could work on your end.
>
> Emily
>
> Emily Atkinson
> Management Analyst/Office Manager
> Immediate Office of the Assistant Administrator
> Office of Air and Radiation, USEPA
> Room 5412B, 1200 Pennsylvania Avenue NW
> Washington, DC 20460
> Voice: 202-564-1850
> Email: atkinson.emily@epa.gov

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Wednesday, January 17, 2018 10:34 AM
To: Lewis, Josh <Lewis.Josh@epa.gov>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Josh,
In addition to the week of the 29th we could also do Monday, February 5 or Tuesday, February 6 before 1.
Let me know if you need additional date ranges to work with.
Best,
Laurie

From: Lewis, Josh [mailto:Lewis.Josh@epa.gov]
Sent: Friday, January 12, 2018 2:16 PM
To: Laurie Holmes <lholmes@mema.org>; Catherine Boland <cboland@MEMA.ORG>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: FW: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

+ Emily and – Bill.

Is there a rough date or dates you were looking to come in?

Josh Lewis
Chief of Staff
EPA/Office of Air and Radiation
Office: 202 564 2095
Cell: Ex. 6 Personal Privacy (PP)

From: Laurie Holmes [mailto:lholmes@mema.org]
Sent: Friday, January 12, 2018 10:56 AM
To: Wehrum, Bill <Wehrum.Bill@epa.gov>
Cc: Catherine Boland <cboland@MEMA.ORG>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Bill, Thank you so much.
Josh, Look forward to hearing from you.

From: Wehrum, Bill [mailto:Wehrum.Bill@epa.gov]
Sent: Friday, January 12, 2018 7:38 AM
To: Laurie Holmes <lholmes@mema.org>
Cc: Catherine Boland <cboland@MEMA.ORG>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Re: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Laurie. I'd be happy to talk with you. I've copied my chief of staff, Josh Lewis, who can help coordinate.

_____
Bill Wehrum
Assistant Administrator
Office of Air and Radiation

U.S. Environmental Protection Agency
(202) 564-7404

On Jan 11, 2018, at 1:33 PM, Laurie Holmes <lholmes@mema.org> wrote:

Bill:
MEMA would like to request a meeting to discuss the midterm evaluation on the vehicle greenhouse gas emission standards.

MEMA represents more than 1,000 companies that manufacture components, systems and materials for motor vehicles and represents the largest sector of manufacturing jobs in the U.S. Since auto suppliers play a major role in developing the technologies necessary for vehicle emission reduction, suppliers have a strong interest in the midterm evaluation and the standards. Our position is also not identical to the vehicle manufactures on the issue.

It would be helpful if we could discuss with you the impact the program has had and will have on our industry.

Look forward to hearing from you.

Laurie Holmes
Senior Director, Environmental Policy
Motor & Equipment Manufacturers Association
1030 15th Street NW, Suite 500 East
Washington, DC 20005
Direct: 202-312-9247
Mobile: Ex. 6 Personal Privacy (PP)
<image001.png>
April 10-11 | Washington, DC
www.mema.org/dcsummit

Appointment

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 11/21/2017 9:49:03 PM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Harlow, David [harlow.david@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Sutton, Tia [sutton.tia@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Charmley, William [charmley.william@epa.gov]; Moran, Robin [moran.robin@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Woods, Clinton [woods.clinton@epa.gov]
BCC: DCRoomARN5415PolyPCTB/DC-ARN-OAR [DCRoomARN5415PolyPCTB@epa.gov]

Subject: Meet with National Coalition for Advanced Transportation (NCAT) (Confirmed)
Attachments: RE: Request for Meeting; Confirmed 12/13 at 4pm: Request for Meeting
Location: WJC-N 5415 + Video with AA + Ex. 6 Personal Privacy (PP)

Start: 12/13/2017 2:30:00 PM
End: 12/13/2017 3:15:00 PM
Show Time As: Busy

To: Bill Wehrum, Mandy Gunasekara, David Harlow, Alex Dominguez, Ben Hengst, Tia Sutton, Chris Grundler, Bill Charmley, Robin Moran, and Mike Olechiw, Clint Woods
Outside Attendees (in person): TBD

Confirmed 12/13 at 4pm: Request for...

RE: Request for Meeting

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 11/22/2017 1:49:21 PM
To: Robert.Wyman@LW.com
CC: Loving, Shanita [Loving.Shanita@epa.gov]
Subject: Confirmed 12/13 at 4pm: Request for Meeting

Hi Bob,

You are confirmed for a 45 minute in person meeting on Wednesday, December 13, 2017 at 4:00pm with Bill Wehrum.

Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Acting Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

-----Original Message-----
From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Tuesday, November 21, 2017 4:57 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Request for Meeting

Yes, definitely. Thank you.

From: Atkinson, Emily <Atkinson.Emily@epa.gov>
Sent: Tuesday, November 21, 2017 1:48:14 PM
To: Wyman, Robert (LA)
Cc: Loving, Shanita
Subject: RE: Request for Meeting

Hi Bob,

It looks like Bill Wehrum could be available for a 45 minute in person meeting on Wednesday, December 13, 2017 at 4:00pm.

Please advise if this could work on your end.

Thank you.
Emily

Emily Atkinson
Management Analyst/Office Manager

Immediate Office of the Acting Assistant Administrator Office of Air and Radiation, USEPA Room 5412B, 1200 Pennsylvania Avenue NW Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: ROBERT.WYMAN@lw.com [mailto:ROBERT.WYMAN@lw.com]
Sent: Friday, November 17, 2017 6:03 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Request for Meeting

Emily - thank you for speaking with me by telephone earlier today. I am writing to request a meeting with Bill Wehrum on the subject of the midterm evaluation and the national greenhouse gas emissions standards for motor vehicles. I make this request on behalf of the National Coalition for Advanced Transportation (NCAT).

NCAT is a coalition of leading companies that support electric vehicle and other advanced transportation technologies and related infrastructure, including through: energy supply, transmission and distribution; vehicle and component design and manufacturing; charging infrastructure, battery and other energy-storage technology design, production and implementation; infrastructure engineering and construction; and the movement of passengers, goods and services; among other activities. Prior to our meeting, I will provide a list of NCAT attendees.

If possible, we would like to meet with Mr. Wehrum and appropriate staff, as he determines, on Wednesday, December 13, at any time. Of course, we recognize that his schedule may not permit meeting on this date, in which case we will do our best to accommodate whatever date he selects.

Sincere thanks.

Bob

Robert A. Wyman, Jr.
LATHAM & WATKINS LLP
Email: robert.wyman@lw.com<mailto:robert.wyman@lw.com>

355 South Grand Avenue
Los Angeles, CA 90071-1560
Direct: +1.213.891.8346

555 Eleventh Street, NW
Washington, DC 20004-1304
Direct: +1.202.654.7119

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Latham & Watkins LLP or any of its affiliates may monitor electronic communications sent or received by our networks in order to protect our business and verify compliance with our policies and relevant legal requirements.

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Appointment

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 1/9/2018 3:53:42 PM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Charmley, William [charmley.william@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Moran, Robin [moran.robin@epa.gov]; Alson, Jeff [alson.jeff@epa.gov]; Burch, Julia [Burch.Julia@epa.gov]; Orlin, David [Orlin.David@epa.gov]; Kataoka, Mark [Kataoka.Mark@epa.gov]

Subject: Meet with VNG Co re: natural gas vehicles program (Confirmed)
Attachments: Updated VNG Comments on EPA-HQ-OAR-2015-0827.pdf; NGV Executive Action Summary.docx; RE: Meeting Request re: Natural Gas Vehicles; Confirmed 1/30 at 4pm: Meeting Request re: Natural Gas Vehicles; RE: Confirmed 1/30 at 4pm: Meeting Request re: Natural Gas Vehicles; EPA Memo 1.26.18.pdf; A Regulatory Reform Agenda for NGVs v2 (002).pdf; EPA presentation Dec 14 vF.PDF
Location: WJC-N 5400 + Video with AA Room C174

Start: 1/30/2018 9:00:00 PM
End: 1/30/2018 9:45:00 PM
Show Time As: Busy

Materials attached (last three PDFs)
To: Bill Wehrum, Mandy Gunasekara, Chris Grundler, Bill Charmley, Ben Hengst, Robin Moran, Jeff Alson, Julia Burch, David Orlin, Mark Kataoka
Outside Attendees (in person):

- Robert Friedman, COO
- Bob Atkinson, Chief Regulatory Officer
- Larry Highbloom, Chief Administrative Officer
- Susan Lent, Akin Gump
- Jamie Tucker, Akin Gump

A Regulatory Reform Agenda for NGVs

A fast-track rulemaking to reform natural gas vehicle (NGV) incentives can be accomplished simply. The reforms necessary to achieve this goal are straightforward and fully justified by the game-changing environmental benefits of NGV technology, including the use of renewable natural gas (RNG), the potential for high-efficiency engines, and synergies with hydrogen fuel cell vehicles. We recommend four actions:

- **Restore 0.15 Divisor:** NGV emissions calculations should return to the "0.15 divisor" effective immediately, with emissions calculated as 85% below a gasoline vehicle (as was the case before 2016). This is justified by the game-changing real-world emissions benefits of RNG, and is moreover harmonized with Congressionally-mandated incentives under the CAFE program.

  We recommend reinstating language from the MY 2011-2016 regulations under 40 C.F.R. § 600.510–12, Calculation of average fuel economy and average carbon-related exhaust emissions.

- **Remove Dual-Fuel Design Requirements:** EPA should remove the utility factor requirements for a 2:1 ratio of CNG-to-gasoline range, as well as the requirement for dual-fuel NGVs to only use gasoline when the CNG tank is empty. These unnecessary design requirements add cost and reduce the appeal of these vehicles to consumers, and analogous plug-in hybrid electric (PHEV) vehicles face no such requirements despite having far lower driving range on electricity (<40 miles) compared to the typical natural gas range of a dual-fuel NGV pickup (250+ miles).

  This could be achieved by deleting the requirements in 40 C.F.R. § 600.510–12, Calculation of average fuel economy and average carbon-related exhaust emissions, part (c)(2)(vii)(B) for fuel economy and (j)(2)(vii)(B) for emissions.

- **NGV Pickup Incentive:** EPA has recognized the unique challenges facing full-sized pickups, and natural gas could be the ideal low-emission platform for these vehicles. This could be encouraged by offering a "Natural Gas Pickup" incentive similar to current hybrid-electric and "performance-based" pickup incentives; however, for the natural gas pickup credit, minimum deployment thresholds (10% of all full-size pickups for existing credits) should be eliminated to reflect the greater market challenges faced by NGVs - since, unlike hybrids, they use an alternative fuel.

  This could be accomplished by inserting a new section (c) under 40 C.F.R. § 86.1870–12, CO2 credits for qualifying full-size pickup trucks, titled "Credits for implementation of natural gas technology." The structure of these credits would be similar to those for sections (a) and (b), but without requirements for the "required minimum percent of full size pickup trucks."

- **Recognize Retrofits:** Encouraging retrofits of older gasoline vehicles to run on CNG is slightly more complex, but offers a unique opportunity to reduce vehicle emissions throughout their useful life instead of just at the point of sale. EPA should allow certified converters to "opt in" to the program and generate credits for CNG retrofits and upfits, prorated in proportion to their remaining useful life. Retrofits could also be encouraged by providing credits for CNG "prep packages" that reduce the costs of subsequent conversion to natural gas, as part of the off-cycle credit technologies menu listed at *40 C.F.R. § 86.1869–12, CO2 credits for off-cycle CO2-reducing technologies.*

For further info: Robert Atkinson, Chief Reg. Officer, VNG. rcatkinson@vng.co; 908-447-4201

VNG

ARIEL

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 1/10/2018 1:47:37 PM
To: Tucker, Jamie [jtucker@AKINGUMP.COM]
CC: Feeley, Drew (Robert) [Feeley.Drew@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]
Subject: Confirmed 1/30 at 4pm: Meeting Request re: Natural Gas Vehicles

Hi Jamie,
You are confirmed for a 45 minute meeting on Tuesday, January 30, 2018 at 4:00pm with Bill Wehrum. Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.
Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Tucker, Jamie [mailto:jtucker@AKINGUMP.COM]
Sent: Tuesday, January 09, 2018 3:02 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Feeley, Drew (Robert) <Feeley.Drew@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: RE: Meeting Request re: Natural Gas Vehicles

That's terrific and will work on our end. I will follow up shortly with a complete list of attendees on our part, but let's go ahead and book it.

Thanks.

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Tuesday, January 09, 2018 10:53 AM
To: Tucker, Jamie
Cc: Feeley, Drew (Robert); Lewis, Josh
Subject: FW: Meeting Request re: Natural Gas Vehicles

Hi Jamie,

It looks like Bill Wehrum could be available for a 45 minute meeting on Tuesday, January 30, 2018 at 4:00pm.

Please advise if this could work on your end.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Tucker, Jamie [mailto:jtucker@AKINGUMP.COM]
Sent: Wednesday, January 03, 2018 3:21 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Cc: Feeley, Drew (Robert) <Feeley.Drew@epa.gov>
Subject: Meeting Request re: Natural Gas Vehicles

Emily/Josh - On behalf of VNG.Co, a natural gas vehicle fueling infrastructure company, we wanted to see if Assistant Administrator Wehrum would be available this month to discuss a number of administrative and legislative policy changes the company is advocating to promote the adoption of natural gas vehicles largely by leveling the playing field with electric vehicles. We have had recent conversations with the Office of Policy as well as the Office of Transportation and Air Quality to discuss these proposals as well as with staff at the White House and Department of Transportation. With Mr. Wehrum's confirmation we would like to fold him into the conversation as well.

Natural gas vehicles provide a cost effective and additional pathway for automaker emissions compliance while preserving the products' consumer appeal, and are therefore worthy of being included in a portfolio of solutions along with EVs to achieve the objectives.

Among the key advantages of the proposed regulatory changes is the benefit to achieving emissions reductions in the light-duty truck category which accounts for 64% of new vehicle purchases (and are responsible for even greater amounts of fuel use and pollution if you take into account the differential in fuel economy between light-duty trucks and passenger cars), and for which there is not a viable electrification solution.

Specifically, we would encourage the Administration to consider:

- **Restoring the 0.15 "divisor"** in EPA's compliance calculations, equivalent to NHTSA's statutory Petroleum Equivalency Factor that counts a gallon-equivalent of natural gas as 0.15 gallons of gasoline. The previous Administration ended this powerful incentive while simultaneously providing electric vehicles with additional emissions incentives on the hope that EVs would be "game changers." The game has now changed for NGVs. The shale revolution that has occurred since the current rules were set as well the development of Renewable Natural Gas as the lowest carbon vehicle fuel are true game changers that strongly justify returning to the 0.15 divisor.

The powerful and well-justified incentive of the 0.15 divisor would be complemented and made even more effective by additional changes including:

- **Eliminating range requirements on bi-fuel NGVs** that results in an impractical natural gas tank size requirement that is twice the size of the gasoline tank and costly design requirements for NGVs, whereas no such range requirements exists for hybrid electric vehicles. This is the most important regulatory change as a complement to the 0.15 divisor of the three.

- **Providing NGV pick-ups with the bonus credits** provided to "strong electric hybrid pick-ups" and **eliminating the existing minimum 10% deployment threshold** to qualify for pickup bonus credits.

- **Establishing a new incentive to encourage retrofitting existing gasoline and diesel vehicles to run on natural gas**, something that isn't feasible for electric drives but which will reduce emissions by the existing fleet of vehicles

Enclosed for your further consideration are our Midterm Evaluation comments as well as information outlining the rationale for the recommended regulatory changes.

Thank you for your consideration.

Jamie

Jamie Tucker
AKIN GUMP STRAUSS HAUER & FELD LLP
1333 New Hampshire Avenue, N.W. | Washington, DC 20036-1564 | USA | Direct: +1 202.887.4279 | Internal: 24279
Fax: +1 202.887.4288 | jtucker@akingump.com | akingump.com | Bio

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A Rulemaking to Unlock the Potential of Natural Gas Vehicles

During the previous administration, EPA pushed automakers to manufacture light duty electric vehicles (EVs) as a means of meeting fuel economy and emission standards, ignoring the benefits of natural gas vehicles (NGVs). Not only did EPA remove the NGV incentives provided by Congress under the law, it failed to consider NGV technology development, the full impact of the shale revolution, or the growth of renewable natural gas (RNG) in its Technical Assessment Report on the regulations.

Natural gas is an abundant resource and is uniquely suited as a fuel for light trucks, which make up 64% of the passenger vehicle market and an even greater percentage of fuel use and pollution due to their lower fuel economy. EVs, on the other hand, are limited to lighter weight and luxury passenger cars. With automakers struggling to meet emissions standards, it is critical that EPA provide alternative compliance options, including incentivizing automakers to add NGVs to their product lines.

EPA can solve this urgent problem with a rulemaking to reform light-duty vehicle regulations for NGVs. With appropriate support, NGVs can deliver these much-needed benefits:

- **Game-Changing Lifecycle Emissions:** NGVs reduce greenhouse emissions by up to 25% with fossil natural gas and can achieve *negative* lifecycle emissions with RNG from landfills, dairy farms, and other sources. With 35% of NGV fueling coming from RNG already, these vehicles are clearly delivering game-changing emissions on par with EVs – and should be incentivized as such.
- **Alternative Fuel for Light Trucks:** EVs are an option for small cars, but battery cost and weight are prohibitive for electrifying larger vehicles like pickups and light trucks. By contrast, NGVs are a proven alternative for light trucks, with both OEM and conversion-certified pickup models as well as bi-fuel configurations that can run on gasoline (key for addressing "range anxiety" for early adopters).
- **Cleaning Up Older Vehicles:** While it's impossible to electrify existing vehicles, they *can* be converted to natural gas – as in states like Oklahoma and Utah that have encouraged thriving retrofit industries. Automaker support of NGVs will reduce retrofit costs and presents a unique opportunity to reduce emissions from the highly polluting used vehicle fleet and expand the benefits of the rules.
- **Economic Benefits:** In addition to the environmental benefits of NGVs, they offer the opportunity to bolster economic growth in the automotive industry, the natural gas industry, and even the agriculture and waste industries, which can benefit from the production and sale of RNG fuel.

The fact that the considerable benefits of NGVs have been previously ignored by EPA is reason enough to convene a rulemaking as proposed by VNG last year in its Regulatory Reform comments, instead of waiting for the Mid-Term Evaluation. Another compelling reason to fast-track these reforms is to unlock a win-win compromise by expanding the portfolio of low-emission solutions for automakers beyond EVs.

- **Breaking Through the Logjam on Vehicle Rules:** Automakers need a reform of the rules because they currently have no cost-effective way to meet their emission targets for pickups and light trucks, which are essential to their economic health. Meanwhile, California policymakers are demanding that the targets remain, threatening years of legal uncertainty and a fractured regulatory landscape.

NGVs are the missing piece of the puzzle. The massive environmental benefits of RNG have already been acknowledged by the California Air Resources Board, and the potential of NGVs as a light truck alternative have already been demonstrated by automakers. By reforming regulations to recognize the benefits of NGVs (and harmonize with CAFE incentives in the process), EPA can provide automakers a cost-effective compliance option for light trucks. This would help the environment *and* the economy, through job creation, GDP growth, and trade deficit reduction.

For further info: Robert Atkinson, Chief Reg. Officer, VNG. rcatkinson@vng.co; 908-447-4201

VNG

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NGVs, Light Trucks, & the Mid-Term Evaluation

Meeting with Environmental Protection Agency, 12/14/17

Robert Atkinson, VNG Chief Regulatory Officer
RCAtkinson@vng.co, 908-447-4201

Dec-17

VNG and Ariel – Who We Are

- VNG and Ariel are collaborating on this regulatory initiative
- Ariel is the largest manufacturer of reciprocating gas compressors in the world
- VNG builds CNG fueling for light- & medium-duty fleets at existing gasoline stations
  - High-visibility locations that are accessible, convenient, and consumer-friendly, with full service C-store retail amenities; major contrast to heavy-duty CNG private fleet depots, utility yards
  - Locations in Philadelphia, Houston, Dallas, and Milwaukee
  - Discussions with major light-duty fleet for fueling in California (operates ~4,000 NGVs in state)
- VNG has been a leading voice for light-duty NGVs, cited in original 2017-2025 rule

Expanding Compliance Options for Light Trucks

The Problem With Low Gasoline Prices

- As noted in TAR, market shift towards light trucks reduces aggregate emissions benefits of regulations, even if individual OEM targets adjust to compensate
- Battery cost and weight means no EV pickups for foreseeable future – the OEMs' most popular, profitable, and polluting vehicles

NGVs Could Be The Solution – With EPA Support

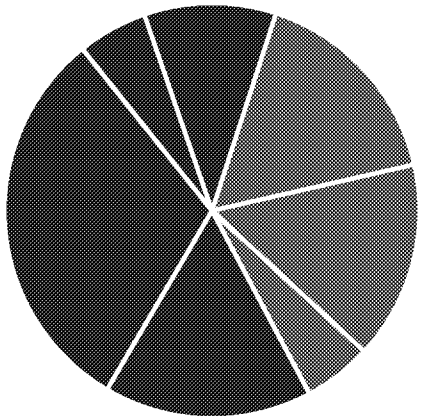
- NGVs have seen dramatic, game-changing reductions in lifecycle emissions since original rulemaking, thanks to major uptake of renewable natural gas (RNG)
- OEMs have already experimented with NGV pickups with limited production of Dodge Ram and Chevy Silverado bi-fuels, CNG-ready Ford F-150

With revised incentives that recognize rapid growth of RNG fueling, NGVs could be a key low-emission compliance pathway for light trucks for 2025 and beyond.

Shift To Light Trucks Eroding Benefits of Rules

YTD 2017 Sales

LIGHT TRUCKS
63% of YTD 2017 auto sales
+4.6% from YTD 2016



CARS
42% of YTD 2017 auto sales
-10.3% from YTD 2016

Source: Wall Street Journal

- Gasoline prices have plunged since rulemaking, shifting market to larger vehicles
- Not a current compliance problem for OEMs, since targets adjust to sales mix
- BUT shift will reduce aggregate emissions benefits of regulations
- Growing OEM concerns about limited compliance options for light trucks - and pickups especially

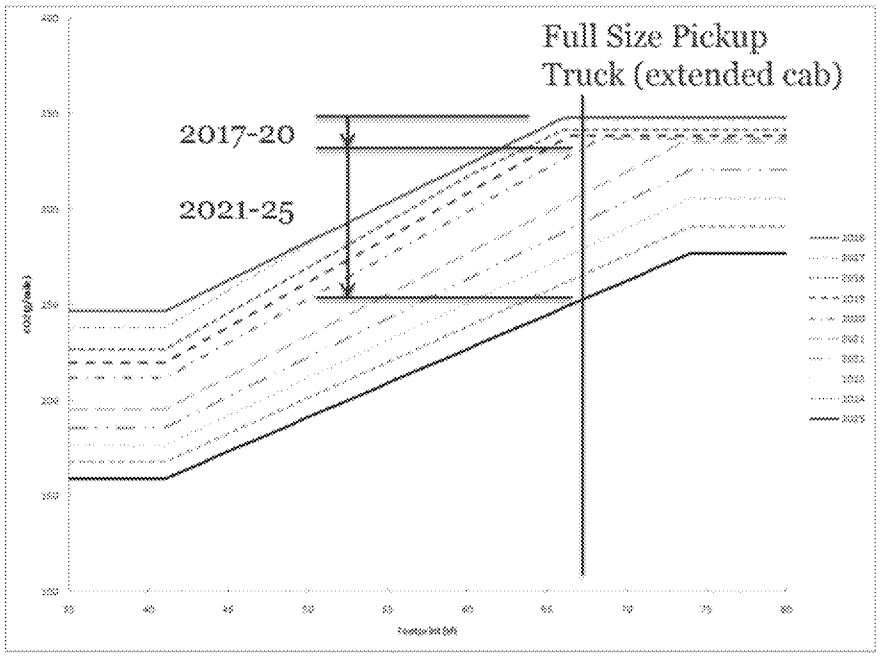
Emission Solutions for Pickups Most Urgently Needed

- Pickups are the top-selling vehicles, most profitable, and most polluting
- Pickups also face the most dramatic increase in CO2 emission requirements in 2021-2025 period – biggest challenge for automakers, few tech options

- No EV alternatives for foreseeable future (2025+) due to weight and utility requirements (2016 TAR)
- Natural gas (or natural gas-ready) versions of Chevy Silverado, Dodge Ram, and Ford F-150 have already been rolled out by OEMs

With support from EPA, NGVs could be best compliance pathway for automakers for light trucks for 2025 and beyond.

Figure I-4 CO2 (g/mile) Light-Truck Standard Curves



Source: Westport

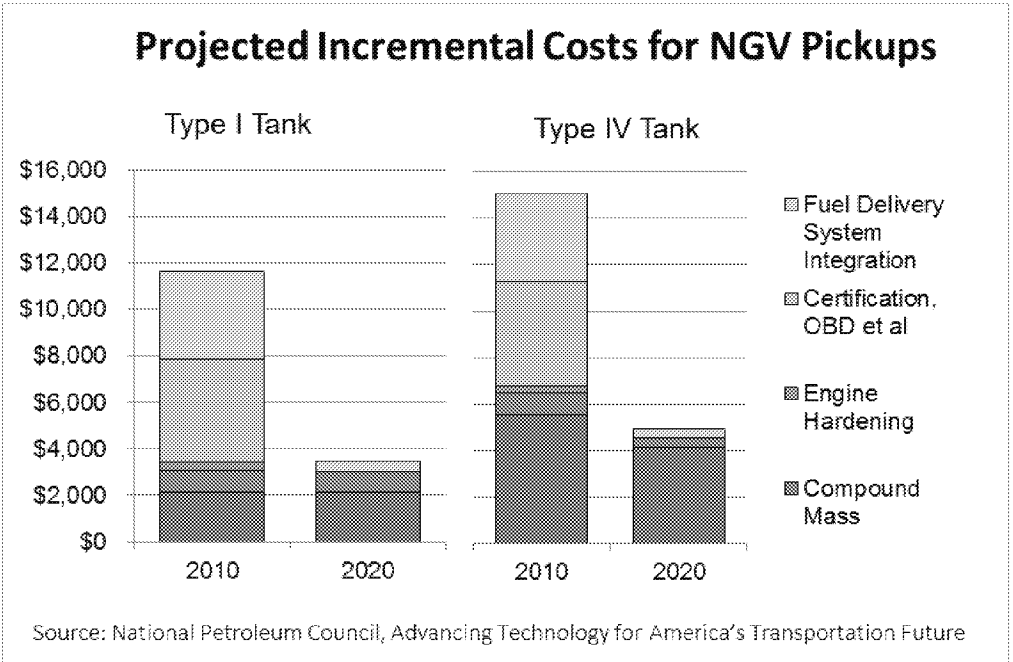
RNG: From 0% to 35% of NGV Fueling Since 2012

- **Original rulemaking:** *"Biomethane will remain a small part of the overall natural gas market for the foreseeable future"…*
- **Today:** Biomethane/RNG accounts for about 35% of national NGV fueling, 60% in California (Fleets & Fuels) – and growing as fast as RNG projects can come online
- **Why?** Regulations - and economics. RNG reclassified as cellulosic biofuel in 2014, RIN revenues of ~$23/MMBTU (UC Davis) make it more profitable than fossil.
  - —3x revenues from transportation vs electricity sales (CARB)
  - —California adds another $11+/MMBTU for LCFS sales (UC Davis)
- **Game-Changing Emissions:** Lowest carbon intensity of any fuel measured under California's Low Carbon Fuel Standard – **pathways up to -304 gCO2e/MJ** (CARB)

Economics of RFS and LCFS will ensure continued growth in RNG use for NGVs, and growth in NGV market will be primary driver of new RNG capture projects.

Major NGV Cost Reductions With Scale

- NGVs have far greater potential for rapid incremental cost reductions than EVs, as costs come from design/regulatory – not components (i.e. batteries)
- Fuel system integration + certification are >50% of NGV incremental costs (NPC)
- Fixed costs virtually eliminated overnight if spread over large number of vehicles
- Precedent in Europe (e.g. Italy), where OEM-produced NGVs retail for <$3,000 more than gasoline model (BCG)
- $3,000 is projected cost to lightweight pickup truck for 10% emissions improvement (TAR)
- NGVs offer comparable cost with much greater emission reduction



Advanced Tech for Ultra-Low NGV Pickup Emissions

- NGVs already commercial tech – but can be pushed much farther by taking advantage of high octane, clean-burning properties of gas
- Westport (Cummins JV partner) has proposed "Super Pickup Truck" NGV concept with >30% greater fuel economy, ultra-low NOx
- Advanced tank technologies (e.g. adsorption) another avenue of improvement
- Hybrid/Plug-In Hybrid pathway offers further potential emission reductions

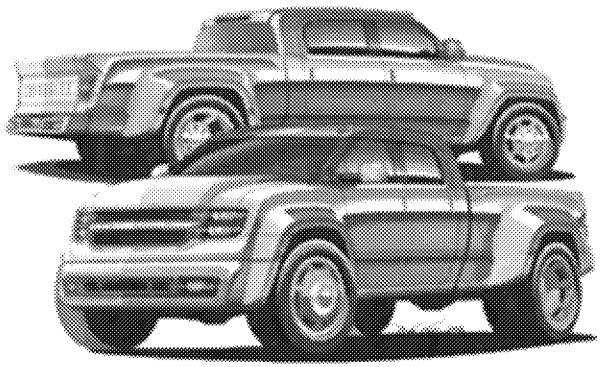
Advanced powertrains that fully exploit ultra high-octane low-carbon fuel properties of methane

a. Not been done to-date – missed opportunity

b. High efficiency and high performance at the same time, outperform gasoline and diesel

c. >30% CO2 reduction TTW

- Westport, "Methane: The Performance Fuel"

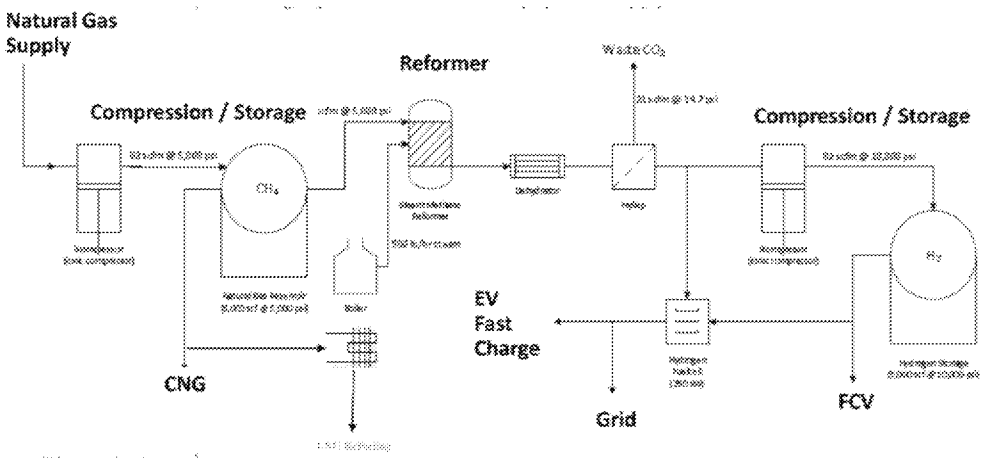


NGV Synergies With Hydrogen

- Vehicle synergy via gaseous fuel storage tech (e.g. adsorption tanks)
- CNG/H2 fueling can be combined, or else CNG stations can be transitioned to H2 at a later date due to shared components
- RNG is also fuel for ultra-low GHG H2 production – NGVs develop market for production infrastructure today for H2 fueling tomorrow

"Planning for the addition of H2 infrastructure at CNG fueling locations can facilitate the adoption of hydrogen at a later date and smooth the transition to near zero carbon technologies."

- UC Davis STEPS Program



Proposed Reforms to GHG Rules – 0.15 Divisor

Return to "0.15 divisor": Calculate CNG emissions as 0.15x gasoline emissions, as in the pre-MY 2016 GHG regulations

- Equivalent to 85% reduction, reflects game-changing lifecycle RNG emissions (some pathways achieve 100% or more)
- Analogous to EV 0 g/mi incentive that assumes 100% renewable electricity; instead, assumes 100% RNG use
  - *RNG use of 35% nationally and growing is equal to % of zero-carbon electricity (renewables + nuclear) in national mix*
- Like EV incentive, can be transitioned to real-world lifecycle emissions based on national RNG use (can use RFS data)
- Harmonizes with CAFE Petroleum Equivalency Factor (PEF)

A return to the 0.15 divisor could enable OEMs to achieve existing 2025 targets and establish NGVs as long-term compliance pathway for light trucks.

Proposed Reforms to GHG Rules – Dual-Fuel Design

Remove utility factor design requirements for dual-fuel NGVs: Eliminate need for 2:1 CNG-to-gasoline range ratio, use of gasoline only when CNG tank is empty

- Dual-fuel vehicles critical to building NGV market as fueling develops, like PHEVs
- Fastest, lowest-cost pathway is adding CNG tank to existing gasoline vehicle
- However dual-fuel NGVs face unique design requirements to receive utility factor, despite having much greater CNG range vs PHEV electric-only range
- Forces automakers to add cost (from shrinking and redesigning gasoline tank) and decrease total range and utility (from increased size of CNG tanks) if they want to receive full utility factor incentives
  - **Example:** FCA chose design simplicity over incentives with Dodge Ram dual-fuel, with 255 miles of CNG range and nearly 400 miles of gasoline range

These design requirements are as unnecessary for dual-fuel NGVs as for PHEVs, and will force OEMs to either limit consumer appeal or lose incentives.

Proposed Reforms to GHG Rules – Pickup Incentive

NGV Pickup Incentive: Create full-size pickup incentive equivalent to hybrid incentives for both dedicated and dual-fuel NGVs with **no** minimum penetration

- Cleaner technologies for pickups badly needed, but currently no projected use of existing full-size pickup advanced technology incentives (2016 TAR)
- NGVs are ideal next-gen pickup platform and could qualify for performance-based incentive (<15% emission reduction)…
- But 10% minimum penetration threshold too high for alternative fuel vehicles; too risky for OEMs to make big, immediate move in critical profit segment
- Removing threshold and awarding incentives for every NGV pickup would encourage OEMs to experiment, invest in new technology

NGV-specific incentive would surpass original goals of full-size pickup incentives by providing new platform for continuous, long-term efficiency improvements

Proposed Reforms to GHG Rules – Retrofits

Retrofit Credits: Create credits based on remaining useful life of converted vehicle: for instance, conversion of 5 year-old pickup would get credit for 50% emission reductions as a new vehicle; credits awarded to converter, can be sold to OEMs

- Vehicle life steadily increasing beyond 10 years, likely to continue growing as vehicle prices increase – how to avoid erosion of program benefits?
- NGV retrofits offer pathway to reduce emissions from vehicles significantly during their useful life – very successful in Utah, Oklahoma
- These emission benefits not currently captured in (or incentivized by) rules
- Synergies with EPA reforms to certification rules in 2011
- Could also add off-cycle credits for CNG-ready "prep packages" (e.g. Ford F-150)

Incorporating retrofits is an "outside the box" solution that would accelerate progress and honor EPA mandate to regulate emissions throughout useful life

Action On NGV Light Trucks is Major Opportunity

Incentivizing NGVs as part of GHG rules ensures continued progress on not only emission reductions but on vehicle and fuel technologies:

- Introduces low-emission options for pickups a decade or more in advance of EV technologies in this segment
- Shifts trajectory of potential emissions improvements for light truck segment, allowing more ambitious post-2025 targets
- Pathway to near-zero emissions and beyond with advanced ICE engines, RNG, and hydrogen synergies
- Drives market for RNG capture, realizing massive lifecycle emission reductions and cost-effective waste recovery that compliments broader EPA agenda

Robert Atkinson, VNG Chief Regulatory Officer
RCAtkinson@vng.co, 908-447-4201

VNG

VNG

Natural Gas Vehicles (NGVs):
The Common Sense Solution To Achieving Emissions Reduction Compliance At Low Cost and Low Risk

NGVs ideally suited to help pickups, light duty trucks reach 2025 emissions goals

- Light duty trucks face biggest compliance challenge, are critical to Big Three future
- EVs not an option – batteries too expensive, too heavy for larger vehicles
  - NGVs are proven: Ford F150, Chevy Silverado, Dodge Ram

Correcting NGV incentives is straightforward – and justified

- No consideration of NGV technology in 2016 Technical Assessment Report despite availability of abundant domestic fuel and vehicle technology
  - Game-changing Renewable Natural Gas (RNG) delivers more than 85% lifecycle emission reductions
- Restore pre-2015 "0.15 divisor" to harmonize EPA with statutory CAFE incentives,
  - Parity with EV incentives: just as EV incentives reflect renewable energy, restoring 0.15 divisor for NGVs would reflect emissions benefits of RNG (85%)
  - Would allow OEMs to easily meet 2025 targets for pickups
- Parity: eliminate arbitrary driving range requirement imposed on bi-fuel NGVs
  - Plug-in hybrids have no requirements despite much shorter electric range
- Provide NGV pickups with same emissions credits as "Strong Hybrids"
  - Eliminate minimum penetration for NGV pickup incentives: NGVs as 10% of all pickups not immediately feasible for alt fuel like natural gas

Additional opportunity for smarter regulations: encourage retrofits

- Retrofitting deployed vehicles with natural gas reduces emissions of existing fleet
- Build on NGV retrofit successes in Oklahoma, greatly expand benefits of rules
- Allow converters to receive credits based on vehicle's remaining useful life, sell/transfer to OEMs

Restoring parity between NGVs and EVs, and between EPA and NHTSA, will provide automakers much-needed compliance flexibility for light trucks and pickups – and by making these changes effective immediately, we can start building this industry today.

Message

From: Tucker, Jamie [jtucker@AKINGUMP.COM]
Sent: 1/29/2018 3:11:31 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]
CC: Feeley, Drew (Robert) [Feeley.Drew@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]
Subject: RE: Confirmed 1/30 at 4pm: Meeting Request re: Natural Gas Vehicles
Attachments: EPA Memo 1.26.18.pdf; A Regulatory Reform Agenda for NGVs v2 (002).pdf; EPA presentation Dec 14 vF.PDF

Please find below the list of attendees for tomorrow afternoon and I've also enclosed for your use a one-pager providing a brief overview as well as separate one-pager describing the four proposed regulatory changes. Lastly, I've also enclosed a more in-depth presentation which we shared in December during a conversation with your team at OTAQ.

We are looking forward to meeting with Mr. Wehrum tomorrow and please let us know if you need any additional background in advance of the meetings.

Attending:
Robert Friedman, COO
Bob Atkinson, Chief Regulatory Officer
Larry Highbloom, Chief Administrative Officer

Susan Lent, Akin Gump
Jamie Tucker, Akin Gump

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, January 10, 2018 8:48 AM
To: Tucker, Jamie
Cc: Feeley, Drew (Robert); Lewis, Josh
Subject: Confirmed 1/30 at 4pm: Meeting Request re: Natural Gas Vehicles

Hi Jamie,
You are confirmed for a 45 minute meeting on Tuesday, January 30, 2018 at 4:00pm with Bill Wehrum. Directions and procedures to 1200 Pennsylvania Avenue NW:

> Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.
>
> Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.
>
> Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.

Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Tucker, Jamie [mailto:jtucker@AKINGUMP.COM]
Sent: Tuesday, January 09, 2018 3:02 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Feeley, Drew (Robert) <Feeley.Drew@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: RE: Meeting Request re: Natural Gas Vehicles

That's terrific and will work on our end. I will follow up shortly with a complete list of attendees on our part, but let's go ahead and book it.

Thanks.

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Tuesday, January 09, 2018 10:53 AM
To: Tucker, Jamie
Cc: Feeley, Drew (Robert); Lewis, Josh
Subject: FW: Meeting Request re: Natural Gas Vehicles

Hi Jamie,

It looks like Bill Wehrum could be available for a 45 minute meeting on Tuesday, January 30, 2018 at 4:00pm.

Please advise if this could work on your end.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Tucker, Jamie [mailto:jtucker@AKINGUMP.COM]
Sent: Wednesday, January 03, 2018 3:21 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Cc: Feeley, Drew (Robert) <Feeley.Drew@epa.gov>
Subject: Meeting Request re: Natural Gas Vehicles

Emily/Josh - On behalf of VNG.Co, a natural gas vehicle fueling infrastructure company, we wanted to see if Assistant Administrator Wehrum would be available this month to discuss a number of administrative and legislative policy changes the company is advocating to promote the adoption of natural gas vehicles largely by leveling the playing field with electric vehicles. We have had recent conversations with the Office of Policy as well as the Office of Transportation and Air Quality to discuss these proposals as well as with staff at the White House and Department of Transportation. With Mr. Wehrum's confirmation we would like to fold him into the conversation as well.

Natural gas vehicles provide a cost effective and additional pathway for automaker emissions compliance while preserving the products' consumer appeal, and are therefore worthy of being included in a portfolio of solutions along with EVs to achieve the objectives.

Among the key advantages of the proposed regulatory changes is the benefit to achieving emissions reductions in the light-duty truck category which accounts for 64% of new vehicle purchases (and are responsible for even greater amounts of fuel use and pollution if you take into account the differential in fuel economy between light-duty trucks and passenger cars), and for which there is not a viable electrification solution.

Specifically, we would encourage the Administration to consider:

- **Restoring the 0.15 "divisor"** in EPA's compliance calculations, equivalent to NHTSA's statutory Petroleum Equivalency Factor that counts a gallon-equivalent of natural gas as 0.15 gallons of gasoline. The previous Administration ended this powerful incentive while simultaneously providing electric vehicles with additional emissions incentives on the hope that EVs would be "game changers." The game has now changed for NGVs. The shale revolution that has occurred since the current rules were set as well the development of Renewable Natural Gas as the lowest carbon vehicle fuel are true game changers that strongly justify returning to the 0.15 divisor.

The powerful and well-justified incentive of the 0.15 divisor would be complemented and made even more effective by additional changes including:

- **Eliminating range requirements on bi-fuel NGVs** that results in an impractical natural gas tank size requirement that is twice the size of the gasoline tank and costly design requirements for NGVs, whereas no such range requirements exists for hybrid electric vehicles. This is the most important regulatory change as a complement to the 0.15 divisor of the three.

- **Providing NGV pick-ups with the bonus credits** provided to "strong electric hybrid pick-ups" and **eliminating the existing minimum 10% deployment threshold** to qualify for pickup bonus credits.

- **Establishing a new incentive to encourage retrofitting existing gasoline and diesel vehicles to run on natural gas**, something that isn't feasible for electric drives but which will reduce emissions by the existing fleet of vehicles

Enclosed for your further consideration are our Midterm Evaluation comments as well as information outlining the rationale for the recommended regulatory changes.

Thank you for your consideration.

Jamie

Jamie Tucker
AKIN GUMP STRAUSS HAUER & FELD LLP
1333 New Hampshire Avenue, N.W. | Washington, DC 20036-1564 | USA | Direct: +1 202.887.4279 | Internal: 24279
Fax: +1 202.887.4288 | jtucker@akingump.com | akingump.com | Bio

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The information contained in this e-mail message is intended only for the personal and confidential use of the recipient(s) named above. If you have received this communication in error, please notify us immediately by e-mail, and delete the original message.

A Regulatory Reform Agenda for NGVs

A fast-track rulemaking to reform natural gas vehicle (NGV) incentives can be accomplished simply. The reforms necessary to achieve this goal are straightforward and fully justified by the game-changing environmental benefits of NGV technology, including the use of renewable natural gas (RNG), the potential for high-efficiency engines, and synergies with hydrogen fuel cell vehicles. We recommend four actions:

- **Restore 0.15 Divisor:** NGV emissions calculations should return to the "0.15 divisor" effective immediately, with emissions calculated as 85% below a gasoline vehicle (as was the case before 2016). This is justified by the game-changing real-world emissions benefits of RNG, and is moreover harmonized with Congressionally-mandated incentives under the CAFE program.

  We recommend reinstating language from the MY 2011-2016 regulations under 40 C.F.R. § 600.510–12, Calculation of average fuel economy and average carbon-related exhaust emissions.

- **Remove Dual-Fuel Design Requirements:** EPA should remove the utility factor requirements for a 2:1 ratio of CNG-to-gasoline range, as well as the requirement for dual-fuel NGVs to only use gasoline when the CNG tank is empty. These unnecessary design requirements add cost and reduce the appeal of these vehicles to consumers, and analogous plug-in hybrid electric (PHEV) vehicles face no such requirements despite having far lower driving range on electricity (<40 miles) compared to the typical natural gas range of a dual-fuel NGV pickup (250+ miles).

  This could be achieved by deleting the requirements in 40 C.F.R. § 600.510–12, Calculation of average fuel economy and average carbon-related exhaust emissions, part (c)(2)(vii)(B) for fuel economy and (j)(2)(vii)(B) for emissions.

- **NGV Pickup Incentive:** EPA has recognized the unique challenges facing full-sized pickups, and natural gas could be the ideal low-emission platform for these vehicles. This could be encouraged by offering a "Natural Gas Pickup" incentive similar to current hybrid-electric and "performance-based" pickup incentives; however, for the natural gas pickup credit, minimum deployment thresholds (10% of all full-size pickups for existing credits) should be eliminated to reflect the greater market challenges faced by NGVs - since, unlike hybrids, they use an alternative fuel.

  This could be accomplished by inserting a new section (c) under 40 C.F.R. § 86.1870–12, CO2 credits for qualifying full-size pickup trucks, titled "Credits for implementation of natural gas technology." The structure of these credits would be similar to those for sections (a) and (b), but without requirements for the "required minimum percent of full size pickup trucks."

- **Recognize Retrofits:** Encouraging retrofits of older gasoline vehicles to run on CNG is slightly more complex, but offers a unique opportunity to reduce vehicle emissions throughout their useful life instead of just at the point of sale. EPA should allow certified converters to "opt in" to the program and generate credits for CNG retrofits and upfits, prorated in proportion to their remaining useful life. Retrofits could also be encouraged by providing credits for CNG "prep packages" that reduce the costs of subsequent conversion to natural gas, as part of the off-cycle credit technologies menu listed at *40 C.F.R. § 86.1869–12, CO2 credits for off-cycle CO2-reducing technologies.*

For further info: Robert Atkinson, Chief Reg. Officer, VNG. rcatkinson@vng.co; 908-447-4201

VNG

ARIEL

A Rulemaking to Unlock the Potential of Natural Gas Vehicles

During the previous administration, EPA pushed automakers to manufacture light duty electric vehicles (EVs) as a means of meeting fuel economy and emission standards, ignoring the benefits of natural gas vehicles (NGVs). Not only did EPA remove the NGV incentives provided by Congress under the law, it failed to consider NGV technology development, the full impact of the shale revolution, or the growth of renewable natural gas (RNG) in its Technical Assessment Report on the regulations.

Natural gas is an abundant resource and is uniquely suited as a fuel for light trucks, which make up 64% of the passenger vehicle market and an even greater percentage of fuel use and pollution due to their lower fuel economy. EVs, on the other hand, are limited to lighter weight and luxury passenger cars. With automakers struggling to meet emissions standards, it is critical that EPA provide alternative compliance options, including incentivizing automakers to add NGVs to their product lines.

EPA can solve this urgent problem with a rulemaking to reform light-duty vehicle regulations for NGVs. With appropriate support, NGVs can deliver these much-needed benefits:

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- **Cleaning Up Older Vehicles:** While it's impossible to electrify existing vehicles, they *can* be converted to natural gas – as in states like Oklahoma and Utah that have encouraged thriving retrofit industries. Automaker support of NGVs will reduce retrofit costs and presents a unique opportunity to reduce emissions from the highly polluting used vehicle fleet and expand the benefits of the rules.
- **Economic Benefits:** In addition to the environmental benefits of NGVs, they offer the opportunity to bolster economic growth in the automotive industry, the natural gas industry, and even the agriculture and waste industries, which can benefit from the production and sale of RNG fuel.

The fact that the considerable benefits of NGVs have been previously ignored by EPA is reason enough to convene a rulemaking as proposed by VNG last year in its Regulatory Reform comments, instead of waiting for the Mid-Term Evaluation. Another compelling reason to fast-track these reforms is to unlock a win-win compromise by expanding the portfolio of low-emission solutions for automakers beyond EVs.

- **Breaking Through the Logjam on Vehicle Rules:** Automakers need a reform of the rules because they currently have no cost-effective way to meet their emission targets for pickups and light trucks, which are essential to their economic health. Meanwhile, California policymakers are demanding that the targets remain, threatening years of legal uncertainty and a fractured regulatory landscape.

NGVs are the missing piece of the puzzle. The massive environmental benefits of RNG have already been acknowledged by the California Air Resources Board, and the potential of NGVs as a light truck alternative have already been demonstrated by automakers. By reforming regulations to recognize the benefits of NGVs (and harmonize with CAFE incentives in the process), EPA can provide automakers a cost-effective compliance option for light trucks. This would help the environment *and* the economy, through job creation, GDP growth, and trade deficit reduction.

For further info: Robert Atkinson, Chief Reg. Officer, VNG. rcatkinson@vng.co; 908-447-4201

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ARIEL

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 1/8/2018 5:01:19 PM
To: Hengst, Benjamin [Hengst.Benjamin@epa.gov]
CC: Lewis, Josh [Lewis.Josh@epa.gov]
Subject: RE: Meeting Request re: Natural Gas Vehicles
Attachments: Updated VNG Comments on EPA-HQ-OAR-2015-0827.pdf; NGV Executive Action Summary.docx

Ok sounds good – thanks Ben.

From: Hengst, Benjamin
Sent: Monday, January 08, 2018 11:59 AM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: RE: Meeting Request re: Natural Gas Vehicles

I think 45 min would be appropriate.

OTAQ invitees would be:
Chris G
Bill Charmley
Ben Hengst
Robin Moran
Jeff Alson
Julia Burch
David Orlin
Mark Kataoka

In talking to Bill, you guys can convey that we don't think that this is a big priority, but that they seem to be heavily engaged with OP political management already, so it makes sense to make sure OAR political management is up to speed, too.

Thanks-Ben

From: Atkinson, Emily
Sent: Monday, January 08, 2018 11:25 AM
To: Hengst, Benjamin <Hengst.Benjamin@epa.gov>
Cc: Lewis, Josh <Lewis.Josh@epa.gov>
Subject: RE: Meeting Request re: Natural Gas Vehicles

Thanks Ben – we can run this recommendation by Bill and then I can reach out to set this one up. If Bill wants to take this meeting – who from OTAQ would you like included on the scheduler? And would 30 minutes be enough or is 45 minutes more appropriate for this group?

From: Hengst, Benjamin
Sent: Monday, January 08, 2018 10:57 AM
To: Lewis, Josh <Lewis.Josh@epa.gov>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Request re: Natural Gas Vehicles

Josh—I ran the traps on this. OTAQ's recommendation is that Bill Wehrum should take the meeting, but that it should be on a later timeline (e.g., early to mid-February).

Please let me know if you want to discuss more. Thanks--Ben

From: Lewis, Josh
Sent: Friday, January 05, 2018 1:16 PM
To: Hengst, Benjamin <Hengst.Benjamin@epa.gov>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: FW: Meeting Request re: Natural Gas Vehicles

Drew Feely in OP called me about something yesterday and mentioned the meeting below in passing...if I'm recalling correctly he said you were part of the OTAQ mtg that Jamie references. If that's true, wondering if you think a follow up meeting now w/ Bill is appropriate?

From: Tucker, Jamie [mailto:jtucker@AKINGUMP.COM]
Sent: Wednesday, January 03, 2018 3:21 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Cc: Feeley, Drew (Robert) <Feeley.Drew@epa.gov>
Subject: Meeting Request re: Natural Gas Vehicles

Emily/Josh - On behalf of VNG.Co, a natural gas vehicle fueling infrastructure company, we wanted to see if Assistant Administrator Wehrum would be available this month to discuss a number of administrative and legislative policy changes the company is advocating to promote the adoption of natural gas vehicles largely by leveling the playing field with electric vehicles. We have had recent conversations with the Office of Policy as well as the Office of Transportation and Air Quality to discuss these proposals as well as with staff at the White House and Department of Transportation. With Mr. Wehrum's confirmation we would like to fold him into the conversation as well.

Natural gas vehicles provide a cost effective and additional pathway for automaker emissions compliance while preserving the products' consumer appeal, and are therefore worthy of being included in a portfolio of solutions along with EVs to achieve the objectives.

Among the key advantages of the proposed regulatory changes is the benefit to achieving emissions reductions in the light-duty truck category which accounts for 64% of new vehicle purchases (and are responsible for even greater amounts of fuel use and pollution if you take into account the differential in fuel economy between light-duty trucks and passenger cars), and for which there is not a viable electrification solution.

Specifically, we would encourage the Administration to consider:

- **Restoring the 0.15 "divisor"** in EPA's compliance calculations, equivalent to NHTSA's statutory Petroleum Equivalency Factor that counts a gallon-equivalent of natural gas as 0.15 gallons of gasoline. The previous Administration ended this powerful incentive while simultaneously providing electric vehicles with additional emissions incentives on the hope that EVs would be "game changers." The game has now changed for NGVs. The shale revolution that has occurred since the current rules were set as well the development of Renewable Natural Gas as the lowest carbon vehicle fuel are true game changers that strongly justify returning to the 0.15 divisor.

The powerful and well-justified incentive of the 0.15 divisor would be complemented and made even more effective by additional changes including:

- **Eliminating range requirements on bi-fuel NGVs** that results in an impractical natural gas tank size requirement that is twice the size of the gasoline tank and costly design requirements for NGVs, whereas no such range

requirements exists for hybrid electric vehicles. This is the most important regulatory change as a complement to the 0.15 divisor of the three.

- **Providing NGV pick-ups with the bonus credits** provided to "strong electric hybrid pick-ups" and **eliminating the existing minimum 10% deployment threshold** to qualify for pickup bonus credits.

- **Establishing a new incentive to encourage retrofitting existing gasoline and diesel vehicles to run on natural gas**, something that isn't feasible for electric drives but which will reduce emissions by the existing fleet of vehicles

Enclosed for your further consideration are our Midterm Evaluation comments as well as information outlining the rationale for the recommended regulatory changes.

Thank you for your consideration.

Jamie

Jamie Tucker
AKIN GUMP STRAUSS HAUER & FELD LLP
1333 New Hampshire Avenue, N.W. | Washington, DC 20036-1564 | USA | Direct: +1 202.887.4279 | Internal: 24279
Fax: +1 202.887.4288 | jtucker@akingump.com | akingump.com | Bio

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Comments by VNG.co LLC on
Reconsideration of the Final Determination of the Mid-Term
Evaluation of Greenhouse Gas Emissions Standards
For Model Year 2022–2025 Light-Duty Vehicles

Docket ID: EPA–HQ–OAR–2015–0827

VNG.co LLC is a developer of compressed natural gas (CNG) fuel dispensing infrastructure for light- and medium-duty natural gas vehicles (NGVs). We welcome this opportunity to comment on the Midterm Evaluation (MTE) of light-duty vehicle greenhouse gas standards established for model years 2022-2025 and provide the agencies[1] with much-needed updated information on NGVs and their ability to contribute to the goals of the regulations.

Indeed, NGVs are perhaps the largest and most consequential knowledge gap in the agencies' work on these regulations to date. The only substantive discussion of NGVs in the 1,217 page Technical Assessment Review (TAR) issued by EPA, NHTSA and CARB was one short paragraph noting the growth in CNG fueling infrastructure,[2] and NGVs were not included in the TAR's models for automaker compliance.[3] This is inexplicable considering that U.S. OEMs (the "Big Three") have each produced pickups that operate on compressed natural gas (CNG) in recent years, as well as the fact that there are 22 million NGVs on the road globally - including many produced by OEMs that also serve the U.S. market.

However, this decision to exclude NGVs from serious analysis becomes even more confounding when one considers the radical changes that have occurred in the emissions profile of this technology since the original rulemaking. Renewable natural gas (RNG) can reduce lifecycle greenhouse emissions by 85% or more compared to gasoline, and this ultra-low carbon biofuel now accounts for over 35% of NGV fueling nationally and over 60% of NGV fueling in California. Furthermore, engine manufacturers are beginning to explore the potential of advanced engine designs to take advantage of CNG's high-octane, inherently low-emission properties - another major opportunity to meet the agencies' goals that has been completely unexplored to date.

The virtual exclusion of NGVs from the analysis and discussion has led to the perception of regulators having a false choice between siding with automakers and consumers on one side and environmentalists on the other. Automakers assert that they cannot stop consumers from buying the larger, less fuel-efficient vehicles they want (and in many cases need), and that meeting the current emissions targets for 2025 would impose major costs and risks on their business. Meanwhile, environmentalists insist that we need to transition our entire vehicle fleet to electric vehicles (including hydrogen fuel cell vehicles) as soon as possible, despite the fact

[1] While these Comments are being submitted in the EPA's docket, it is VNG's expectation that they will be also be considered by the National Highway Traffic Safety Administration (NHTSA) and the California Air Resources Board (CARB), collectively "the agencies."
[2] *Draft Technical Assessment Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025*, ENVIRONMENTAL PROTECTION AGENCY (July 2016), at 9-41, https://nepis.epa.gov/Exe/ZyPDF.cgi/P100OXEO.PDF?Dockey=P100OXEO.PDF (hereinafter "Draft TAR").
[3] *Id.* at 5-502.

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that they are not projected to have more than 1-2% market share through at least 2025 – and are especially unlikely to be a practical choice for SUVs and pickups due to their weight and utility requirements.

NGVs are the missing piece of the puzzle. From an automaker's perspective, they offer a proven pathway to dramatically reducing emissions from their large-footprint vehicles, with similar costs and much greater benefits than lightweighting for pickup trucks. For environmentalists, the use of RNG offers similar or even superior emissions benefits to EVs, while also immediately addressing the segments of the auto market (e.g. light trucks) that are unlikely to have an electric alternative for the foreseeable future.

Reforming the light-duty emission regulations to make NGVs a practical compliance path for automakers thus offers the agencies a way to preserve the stringency of existing targets while simultaneously making it easier for automakers to meet them cost-effectively. Equally important, individual Americans will benefit from the use of a cleaner transportation fuel with lower and more stable pricing, compared to gasoline, all while purchasing the vehicles they want and need at reasonable costs. That's a win-win-win.

The following comments detail the reasons for providing robust regulatory support for NGVs on par with previous regulatory support for EVs, organized into the following sections.

- **The Need for Light Truck Alternatives in a Changing Market Context:** Consumer demand is shifting towards large vehicles with relatively low fuel economy. NGVs are ideally suited to provide a low-emission, non-petroleum alternative for the light truck segment, which is unlikely to be served by electric vehicle (EV) alternatives for the foreseeable future.

- **Renewable Natural Gas - A "Waste-to-Wheels" Emissions Game-Changer:** RNG is a game-changer that puts NGVs on par with an EV powered with wind or solar power - and it accounts for a much higher percentage of NGV fuel use than renewable electricity in the overall electricity mix. The rules must account for this dramatic shift and provide incentives for NGVs similar to those provided for EVs.

- **Potential for Rapid Cost Reductions, Consumer Savings with NGVs:** Unlike EVs, NGVs do not depend on inherently-expensive components like batteries, giving them much greater potential for rapid cost reductions with production at scale. This potential has already been demonstrated by European OEMs and gives NGVs much greater potential for mass-market adoption than the agencies have recognized to date.

- **Importance of Dual-Fuel NGVs:** Dual-fuel (commonly referred to as "bi-fuel") vehicles will play an important role in the market development of NGVs during early years of infrastructure buildout. The agencies took steps towards providing important support for bi-fuel NGVs in the original rulemaking, yet also placed unfair restrictions on this support that were not placed on similarly-important plug-in hybrid electric vehicles.

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- **Advanced NGV Technologies Promise Best Emissions Path for Internal Combustion Engines (ICEs):** The development of new engine technologies optimized for CNG's inherently high-octane, clean-burning qualities gives NGVs unsurpassed potential for environmental performance on a mass-market-ready ICE platform.

- **"Bridge to Hydrogen" Needed More Than Ever:** The agencies have previously recognized the ability of NGVs to provide a "bridge" to hydrogen-fueled vehicles thanks to numerous technology synergies on the vehicle as well as the fueling side. The opportunities for such synergies have expanded in recent years, and are as urgently-needed as ever due to the slow market uptake of hydrogen fuel cell vehicles.

- **Emissions Solution for Mid-Life Vehicles:** Sec. 202(a) of the Clean Air Act requires the agencies to regulate vehicle emissions throughout their useful life, but the current light-duty program only provides incentives for low-emission technologies deployed in *new* vehicles. As states like Oklahoma and Utah have shown, there is significant potential to reduce emissions and petroleum use from older vehicles with CNG retrofits, and these benefits should be recognized and encouraged in these regulations.

- **Addressing the Threat of Petroleum Dependence:** The CAFE program was originally created as a response to the oil crisis of 1973; yet, more than 40 years later, the program has done very little to reduce our near-total dependence on petroleum, and the agencies project that the 2017-2025 rules will not make a meaningful difference either. The current regulations ensure this in part by disadvantaging natural gas, perhaps our best hope for a long-term solution to this problem.

- **NGV Reform Needed Today for 2017-2021 Targets:** Because the current disparity between treatment of NGVs and EVs is so clearly arbitrary and contrary to real-world lifecycle GHG emissions, and because automakers need this compliance flexibility and regulatory certainty in order to confidently invest in NGV production, these changes should be made effective immediately – without waiting for the 2022-2025 period. EPA's review of the 2021 targets as part of this proceeding is an excellent opportunity to do so.

In addition to providing information on each of these topics for use in the rulemaking process, we will indicate the specific topics from EPA's Request for Comment that each section is relevant to, and we will conclude each section with a list of recommended changes to the regulations. By updating the regulations to incentivize the deployment of NGVs similar to the previous administration's focus on incentivizing EVs, the agencies will provide automakers with a greater range of compliance pathways that will help achieve the goals of the regulations sooner and more cost-effectively, to the collective benefit of consumers, the environment and industry.

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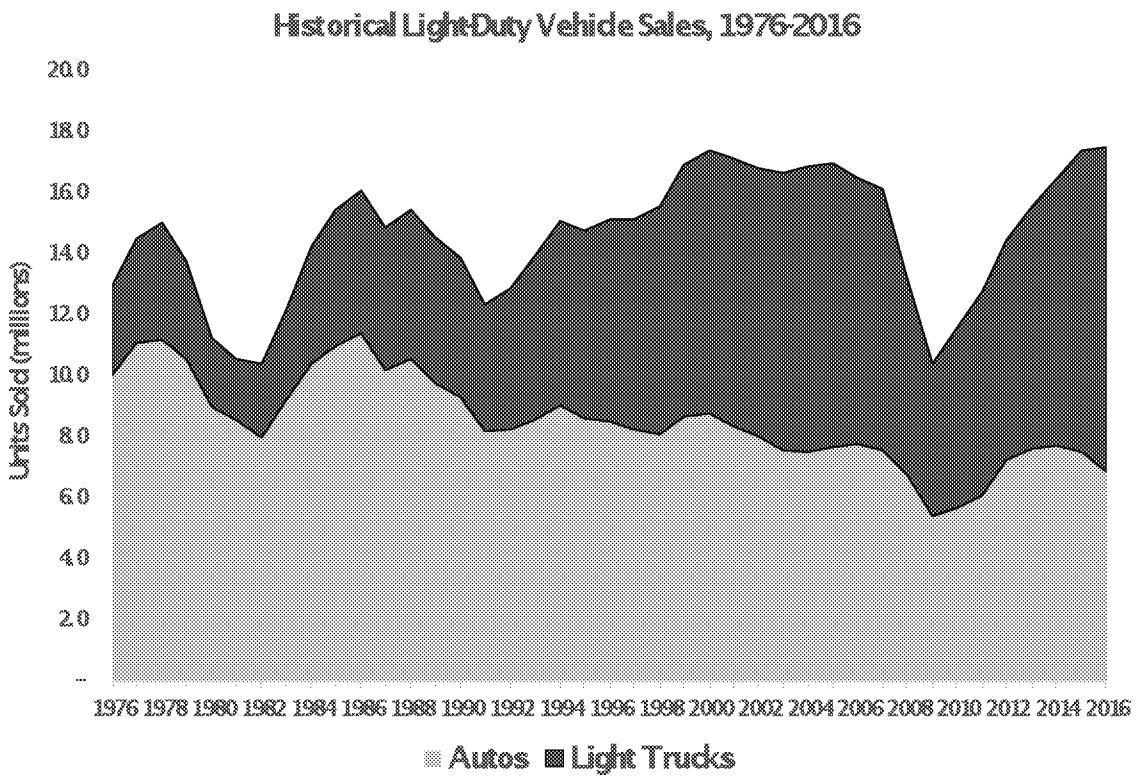
The Need for Light Truck Alternatives in a Changing Market Context

Issues Addressed:

- *The impact of the standards on the automobile industry*
- *The feasibility and practicability of the standards*

As the agencies acknowledged in the 2016 draft Technical Assessment Report (TAR), low gasoline prices have encouraged U.S. consumers to gravitate towards the purchase of larger and less fuel-efficient vehicles. After the Great Recession of 2008 decimated all classes of vehicle sales as well as oil prices, light truck sales have rebounded much more strongly than passenger vehicles and are approaching all-time highs and a market share of over 60%.[4] As the experience of the 1980s-2000s demonstrated, this shift in the market towards light trucks is likely to be sustained if gasoline prices stay low for the long term, as many observers have speculated - including oil majors like Shell, whose CEO recently said that oil prices may be "lower forever."[5]



Source: Bureau of Economic Analysis, 2017[6]

[4] *Auto and Truck Seasonal Adjustment*, BUREAU OF ECONOMIC ANALYSIS (August 2, 2017), https://www.bea.gov/national/xls/gap_hist.xlsx

[5] Sarah Kent, *Shell Prepares for 'Lower Forever' Oil Prices*, WALL ST. J. (July 27, 2017), https://www.wsj.com/articles/royal-dutch-shells-second-quarter-earnings-rise-sharply-1501137915

[6] *Auto and Truck Seasonal Adjustment*, BUREAU OF ECONOMIC ANALYSIS (August 2, 2017), https://www.bea.gov/national/xls/gap_hist.xlsx

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Even if gasoline prices rise again, these large light duty vehicles will always account for a sizable part of the market due to their unique ability to meet specific consumer and business needs. While the footprint-based structure of the rules ensures that automakers will have to increase the fuel economy of all vehicles in order to achieve compliance, the TAR projected that this trend will nonetheless reduce the original projected impacts of the rules on petroleum dependence and greenhouse gas emissions.

The size of light trucks limits the availability of cost-effective solutions to increasing fuel economy and reducing emissions – particularly for full-size pickups, which have added performance requirements. For example, the TAR estimated that the total cost of a 20% mass reduction for towing-capable pickups, which would improve fuel economy and emissions by only 10%, would be roughly $3,000. It is also particularly challenging to electrify light trucks and pickups due to the added cost and weight of the battery packs needed to move these larger vehicles, particularly those built for carrying or towing heavy loads. Indeed, there are very few electric light trucks on the market today and no pickups, and the TAR does not even consider the possibility of electric towing-capable vehicles within the 2025 timeframe.[7]

Pickup trucks are the best-selling vehicles in America, as well as the most important source of profits for the "Big Three" U.S. automakers. Thus, a cost-effective solution to their emissions and petroleum dependence is absolutely essential to ensuring that these companies, their hundreds of thousands of employees, and the millions of consumers and businesses that rely on pickup trucks are not unnecessarily harmed by the agencies' regulations.

Fortunately, and in contrast to electrification, compressed natural gas (CNG) is ideally suited to be a low-emission, non-petroleum alternative fuel for light trucks and pickups especially. Larger vehicle envelopes provide ample room for CNG storage tanks, and since natural gas offers far greater energy density than batteries, it is much better-suited for moving heavy vehicles. These characteristics are why natural gas has long been the clean fuel of choice for heavy-duty vehicles like transit buses and refuse trucks, and the same logic holds true for the heavier side of the light-duty vehicle spectrum.

Indeed, automakers have demonstrated that NGVs are already a viable commercial technology. All three U.S. automakers have offered either CNG-equipped or CNG-ready versions of their flagship full-size pickups, including GM's Chevy Silverado,[8] FCA's Dodge Ram,[9] and Ford's F-

[7] Draft TAR, supra note 2, at 4-40.
[8] Brandon Turkus, *2015 Chevy Silverado HD gets CNG option*, AUTOBLOG (Feb. 6, 2014), http://www.autoblog.com/2014/02/06/2015-chevrolet-silverado-hd-cng-official/.
[9] Richard Truett, *Ram will expand lineup of CNG-powered trucks*, AUTOMOTIVE NEWS (Mar. 4, 2015), http://www.autonews.com/article/20150304/OEM05/150309913/ram-will-expand-lineup-of-cng-powered-trucks.

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150. In fact, in addition to being the best-selling vehicle of any model, the 2016 Ford F-150 was named Green Car Journal's "Green Car of the Year" in part due to the availability of a CNG prep package as an option.[10]

Thus, the rules should encourage automakers to transition these vehicle segments to natural gas in two ways. First, they should be provided strong incentives to do so, including special incentives for pickup trucks similar to the incentive previously created for hybrid-electric pickups. Second, natural gas should be factored into setting targets for what can be reasonably achieved for light trucks and pickups, since this is a mature, proven, commercially-available technology that automakers have already deployed in recent years.

Summary and Recommendations

Because light trucks and pickups especially are a critical market segment for consumers, businesses and automakers, and because neither electrification nor lightweighting are practical alternatives for these heavier vehicles, EPA should provide a clear regulatory pathway for automakers to transition these segments to natural gas.

- Provide emissions credits for all NGVs that reflect the emissions benefits of renewable natural gas (RNG), as discussed in the following section.

- Offer a "Natural Gas Pickup" incentive similar to current hybrid-electric and "performance-based" pickup credits; however, for the natural gas pickup credit, minimum deployment thresholds should be eliminated to reflect the greater market challenges faced by NGVs - since, unlike hybrid-electrics, they use an alternative fuel. Expecting an automaker to immediately transition at least 10% of their critical pickup fleet to an alternative fuel is simply not realistic, and renders the current "performance-based" credit useless despite the fact that natural gas can meet the credit's performance threshold of 20% emission reductions.

    - This goal could be accomplished by inserting a new section (c) under 40 C.F.R. § 86.1870–12, *CO_2 credits for qualifying full-size pickup trucks*, titled "Credits for implementation of natural gas technology." The structure of these credits would be similar to those for sections (a) and (b), but with reduced or eliminated requirements for the "required minimum percent of full size pickup trucks."

[10] *Fuel Efficiency, Alternative Fuels and Sustainability Earn Ford F-150 2016 Green Truck of the Year Award*, FORD MOTOR CO. (Nov. 19, 2015), https://media.ford.com/content/fordmedia/fna/us/en/news/2015/11/19/ford-f-150-earns-2016-green-truck-of-the-year-award.html.

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- Incorporate the use of natural gas when setting targets for practical, achievable emissions improvements for light trucks and full-size pickups.

Renewable Natural Gas - A "Waste-to-Wheels" Emissions Game-Changer

Issues Addressed:

- *The availability and effectiveness of technology, and the appropriate lead time for introduction of technology*
- *Any relevant information in light of newly available information.*
- *The impact of the greenhouse gas emission standards on the Corporate Average Fuel Economy standards and a national harmonized program*

Since the original rulemaking, there has been a dramatic transformation of the lifecycle emissions profile of NGVs due to the rapid adoption of renewable natural gas (RNG) in the transportation sector. Indeed, this is likely the biggest change in the lifecycle emissions of any fuel or vehicle type since the 2011 rulemaking – yet it was completely absent in the draft TAR for reasons that are not clear.

RNG, also known as biogas or biomethane, captures methane produced from a variety of sources including landfills, dairy and livestock operations, and wastewater treatment plants. Once impurities are removed, this methane can be used as a perfect substitute for fossil natural gas, including distribution in the existing natural gas pipeline system and use in NGVs.

Since methane is a powerful greenhouse gas, the use of RNG can achieve massive emission reductions on a CO2-equivalent basis when used as a transportation fuel. While lifecycle emissions can vary significantly depending on the pathway for RNG production, according to the most recent values for the California Low Carbon Fuel Standard (LCFS) it can yield emission cuts of between 70% and *130%*[11] - in other words, NGVs powered by RNG can be carbon-negative, potentially yielding even greater emissions benefits than an electric vehicle powered entirely by solar or wind energy.

[11] Staff Report, CALIFORNIA AIR RESOURCES BOARD, Proposed Re-Adoption of the California Low Carbon Fuel Standard. Dec. 2014. https://www.arb.ca.gov/regact/2015/lcfs2015/lcfs15isor.pdf.

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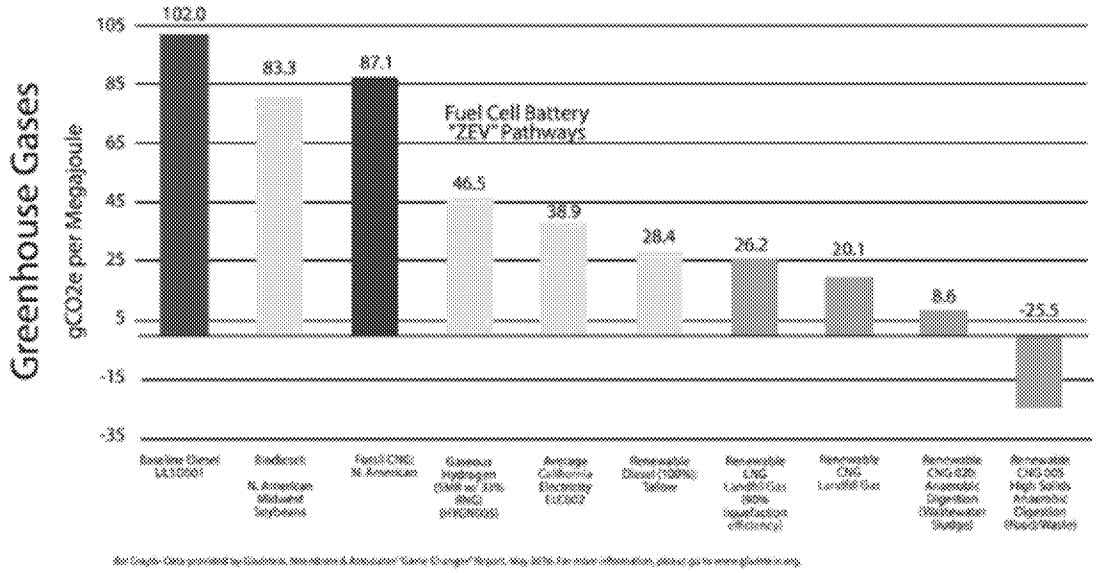


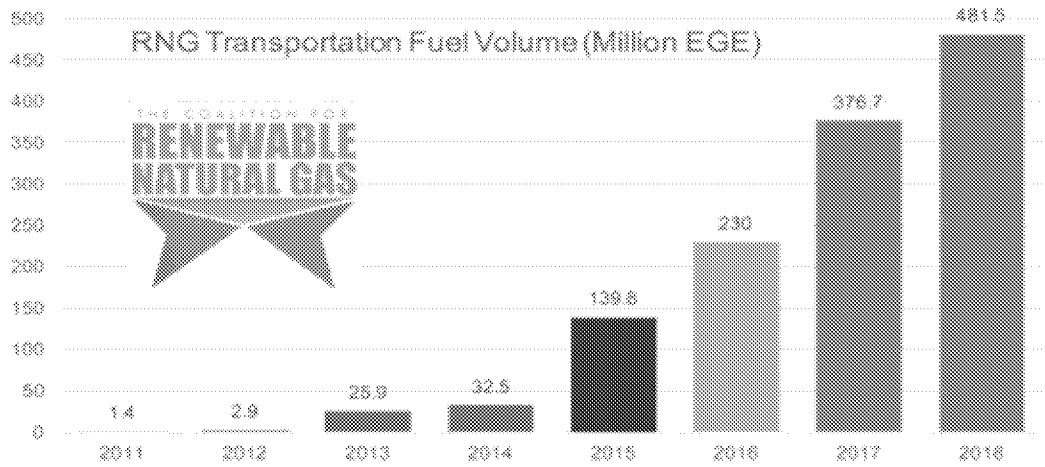
Source: Gladstein, Neandross & Associates[12]

In the original 2017-2025 rulemaking, EPA recognized the potential for RNG to deliver "game-changing" lifecycle GHG emissions for NGVs, but stated that the agency "believe[d] that biomethane will remain a small part of the overall natural gas market for the foreseeable future."[13] This belief is, simply put, outdated. Today, RNG fueling is increasingly the norm for NGVs thanks to the federal Renewable Fuel Standard (RFS) and the California Low Carbon Fuel Standard (LCFS). While these programs were in their infancy during the original rulemaking in 2011, they have since emerged as powerful economic drivers for RNG use in transportation, thanks to the reclassification of RNG as a cellulosic biofuel by EPA[14] as well as CARB's ranking of it as the lowest GHG fuel on the market. [15] Today, the value of these RFS and LCFS credits has made RNG commercially competitive with fossil natural gas.[16]

This economic driver has led to the very rapid increase in the production and sale of RNG fuel to the transportation sector – particularly in California, where fuel retailers can benefit from sales of both LCFS and RFS credits and where there are the largest number of NGVs and natural gas fueling stations. According to the RNG Coalition, over 60% of NGV fueling in California and 35%

[12] *Game-Changer: Next Generation Heavy Duty Natural Gas Engines Fueled By Renewable Natural Gas*, GLADSTEIN, NEANDROSS AND ASSOCIATES (May 2016), http://ngvgamechanger.com/pdfs/GameChanger_FullReport.pdf
[13] 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, 77 Fed. Reg. 62815 (Oct. 15, 2012) (hereinafter "*2012 Light Duty GHG Standards*").
[14] "Renewable Fuel Pathways II Final Rule to Identify Additional Fuel Pathways under Renewable Fuel Standard Program Documents." ENVIRONMENTAL PROTECTION AGENCY. July 18, 2014. https://www.epa.gov/renewable-fuel-standard-program/renewable-fuel-pathways-ii-final-rule-identify-additional-fuel-0
[15] Staff Report, CALIFORNIA AIR RESOURCES BOARD, Proposed Re-Adoption of the California Low Carbon Fuel Standard (Dec. 2014), https://www.arb.ca.gov/regact/2015/lcfs2015/lcfs15isor.pdf
[16] *The Feasibility of Renewable Natural Gas as a Large-Scale, Low Carbon Substitute*, UC DAVIS INSTITUTE OF TRANSPORTATION STUDIES, June 2016. https://www.arb.ca.gov/research/apr/past/13-307.pdf

nationally comes from RNG.[17] In terms of absolute volumes, RNG fuel use in transportation increased fivefold between 2013 and 2015, and the Coalition projects it will more than quadruple between 2015 and 2018.



Source: RNG Coalition, Fleets & Fuels Magazine[18]

With this trajectory of RNG growth, the emissions benefits of NGVs today are already at least as powerful as EVs and likely even greater. Thus, ignoring the growth of RNG is not only outdated, but it renders the regulations ineffective in their stated goal of reducing GHG emissions. It also inhibits job creation not only in the NGV industry but the RNG industry as well, which has the potential to create jobs at farms and municipalities across the country through the capture and sale of locally-produced renewable fuel.

In addition to missing an opportunity to achieve the goals of the regulations, the failure to recognize the emissions benefits of RNG has also resulted in EPA effectively negating Congressional incentives for NGVs under the CAFE program. According to Sec. 6 of the Alternative Motor Fuels Act (AMFA)[19] codified as 49 U.S. Code § 32905, the fuel economy of NGVs and EVs alike is to be calculated using the Petroleum Equivalency Factor (PEF) that treats every gallon-equivalent of compressed natural gas or equivalent electrical energy as 0.15 gallons of gasoline. The goal of this technology-neutral statutory calculation was to provide automakers with a strong incentive to manufacture ***both*** types of alternative fuel vehicles to achieve the goal of American energy independence. By encouraging the production of vehicles that reduce the use of higher-carbon petroleum fuels, the statute also reduces emissions.

While the statute requires that NGVs and EVs be treated the same in terms of measuring fuel economy, there is no equivalent law governing measurement of GHGs. EPA chose to follow

[17] Patrick Couch, *RNG in California: More Than You Think*, FLEETS AND FUELS (Apr. 20, 2016), http://www.fleetsandfuels.com/fuels/cng/2016/04/rng-in-california-more-than-you-think/.
[18] *Id.*
[19] Alternative Motor Fuels Act of 1988, Public Law 100-494, 102 Stat. 2441.

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Congressional CAFE incentives through model year (MY) 2015[20] but thereafter to give NGVs credit for only their tailpipe emissions reductions of approximately 20% compared to gasoline instead of the "0.15 divisor,"[21] while temporarily treating EVs as having *zero* emissions.[22] In its original 2017-2025 rulemaking, EPA acknowledged that this calculation for EVs failed to account for the upstream emissions produced by EVs from power generation but claimed that the long-term potential of EVs to produce "game-changing" emissions when charged with renewable electricity justified this unprecedented incentive.[23]

By contrast, in the same rulemaking EPA recognized the potential for RNG to deliver "game-changing" lifecycle GHG emissions for NGVs, but stated that the agency "believe[d] that biomethane will remain a small part of the overall natural gas market for the foreseeable future."[24] As discussed above, this expectation has been proven wrong for natural gas transportation. To be consistent with this new reality and the goals of the regulation, as well as with the goal of harmonizing EPA's regulations with the statutory CAFE program, the rules should give *both* fuels incentives that reflect their "game-changing" emissions potential: for NGVs, this means credits that are equivalent to 100% RNG fueling, in the same way that the 0 g/mi incentive for EVs is equivalent to the use of 100% renewable electricity.

It would be justifiable to calculate the emissions of a 100% RNG-fueled NGV as 85% below that of a gasoline vehicle - which would be in line with the average cited in the NPC's topic paper on the subject[25] as well as a return to the "0.15 divisor" in line with CAFE's PEF calculation. And, because the present bias towards EV incentives represents the most egregious inconsistency of EPA's regulations with the CAFE program, we believe it is also justifiable to make this change effective immediately, instead of waiting for 2022.

Summary and Recommendations

RNG has transformed the emissions of NGVs since the original rulemaking, accounting for 35% of NGV fueling nationally and delivering emission reductions of 70% to 130%. Because of this game-changing emissions potential, and because existing EPA incentives for alternative fuels are biased towards EVs and disruptive of Congressionally-mandated CAFE incentives for NGVs, the emission calculation for NGVs should be reformed effective immediately.

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[20] Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards, 75 Fed. Reg. 25716 (May 7, 2010)
[21] *2012 Light Duty GHG Standards* at 62623, 62816.
[22] *Id.* at 62819.
[23] *Id. at* 62820.
[24] *Id.* at 62815.
[25] Report, NATIONAL PETROLEUM COUNCIL, *Advancing Technology for America's Transportation* (2012), http://www.npc.org/reports/trans.html.

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- NGV emissions calculations should return to the "0.15" divisor used before 2016, with emissions calculated as 85% below a gasoline vehicle. This is both justified by the real-world emissions benefits of RNG and is consistent with the CAFE program.

    - We recommend reinstating language from the MY 2011-2016 regulations under 40 C.F.R. § 600.510–12, *Calculation of average fuel economy and average carbon-related exhaust emissions*: "For natural gas-fueled model types . . . the carbon-related exhaust emissions value calculated for that model type in accordance with paragraph (b)(2) of this section multiplied by 0.15 and rounded to the nearest gram per mile, except that manufacturers complying with the fleet averaging option for N_2O and CH_4 as allowed under § 86.1818 of this chapter must perform this calculation such that N_2O and CH_4 values are not multiplied by 0.15.[26]"

- This change should be effective retroactively to model year 2017, given the major impediment to NGV adoption posed by the current incentive structure as well as the uniquely egregious regulatory overreach it represents compared to the CAFE program.

- To mirror EV incentives, EPA could consider a similar volume-based transition after 2022 to a regime that considers the real-world use of RNG just as EV incentives will ultimately be calculated based on real-world lifecycle emissions; this would be relatively simple to do since EPA already tracks RNG use under the RFS program.

Potential For Rapid Cost Reductions, Consumer Savings with NGVs

Issues Addressed:
- *The cost on the producers or purchasers of new motor vehicles*
- *The feasibility and practicability of the standards*

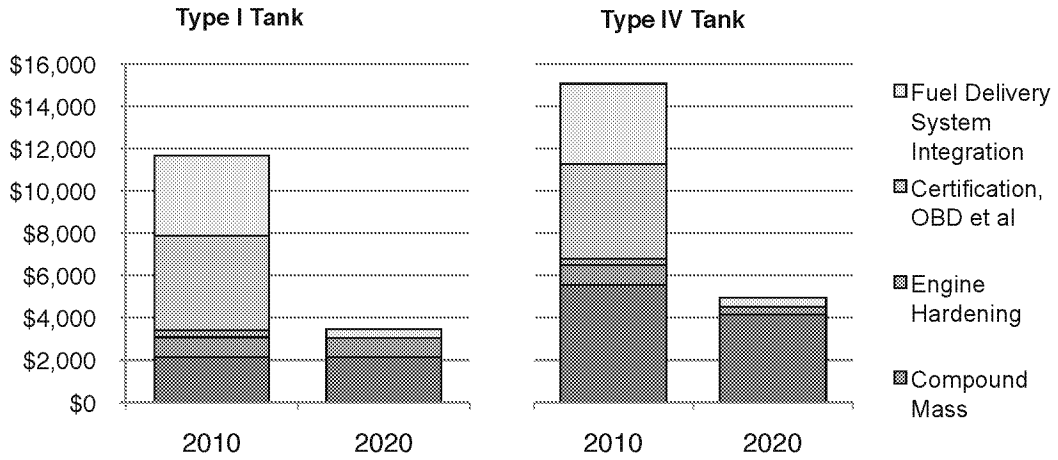
As part of a shift towards a serious analysis of NGVs in the MTE, the agencies must consider not only the current costs of NGVs but their potential for very rapid cost reductions with production at scale. Indeed, while the current incremental prices of CNG pickups are typically $10,000 or more (including upfitting costs), these high costs are primarily due to the need to spread significant up-front design and certification costs over a small number of vehicle sales.

The 2012 report "Advancing Technologies for America's Transportation Future" by the National Petroleum Council (NPC) estimates that about two thirds of the incremental cost of a NGV pickup comes from these areas, and that incremental costs could be reduced to $3,500 per vehicle by 2020 simply by moving to high-volume production (over 100,000 vehicles per year).[27]

[26] 40 C.F.R. § 600.510–12(j)(2)(iii)(A).
[27] Report, NATIONAL PETROLEUM COUNCIL, *Advancing Technology for America's Transportation* (2012), http://www.npc.org/reports/trans.html.

These projections are based in part on experiences in major NGV markets in Europe like Italy and Germany, where volume production has driven incremental costs down to $3,000 or less.[28]

Projected NGV Pickup Incremental Costs, National Petroleum Council



This compares very favorably to the current and projected incremental costs of electric and plug-in electric vehicles. Unlike NGVs, which use the same internal combustion engine platforms as gasoline vehicles and mostly only require the addition of a compressed gas tank made of steel or composites, EVs use batteries that require numerous expensive components and can only reduce costs relatively slowly. This is a critical difference for the agencies to incorporate into their planning, given much greater potential for near-term mass-market adoption of NGVs.

The mass-market potential of NGVs is due to the combination of (potentially) low incremental costs along with the lower and more stable price of natural gas compared to petroleum fuels, which allows the incremental cost to be recouped relatively quickly. According to modeling done in conjunction with the NPC study, this combination gave NGVs the potential to achieve a 17 percent light-duty vehicle market share by 2020 - more than twice the combined market share of electric and plug-in electric vehicles given their projected cost improvements.[29] While this 2012 forecast is clearly unrealistic from the perspective of 2017, the impressive potential for mass-market adoption of a cleaner fuel - and *much* cleaner when RNG is used instead of fossil natural gas - remains an opportunity that should be seriously considered in the agencies' analysis and target-setting.

Indeed, putting aside the comparison to EVs, the potential incremental costs for NGV pickups are comparable to the projected costs for 20% mass reduction via lightweighting cited earlier - $3,000 per pickup. However, as previously stated, lightweighting is forecasted to yield a fuel economy and emissions improvement of only 10%. NGV pickups at scale would have a similar

[28] Rohan Nath et al., *A Realistic View of CNG Vehicles in the US*, BCG PERSPECTIVES (June 16, 2014), https://www.bcgperspectives.com/content/articles/energy_environment_automotive_realistic_view_cng_vehicles_us/.
[29] *Id.*

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incremental cost, yet deliver *twice* the emission reductions with fossil natural gas and many times that with RNG. NGV pickups also completely eliminate petroleum dependence, protecting this critical market segment (and all the consumers, businesses, and workers that depend on it) from oil price swings.

Thus, natural gas deserves to be included in the formulation of the targets for pickups and other light trucks just like other fuel efficiency technologies that have been proven to be cost-effective at scale. This would significantly increase the achievable fuel economy and emissions improvements for these segments within the timeframe of the rulemaking and thus provides a strong rationale for potentially maintaining the existing targets. [30]

Summary and Recommendations

Because NGVs have been proven to deliver rapid and deep cost reductions with high-volume production, the agencies should incorporate them as such into their analysis.

- Modeling used to set achievable emissions curves for pickups and light trucks should include natural gas as a proven technology at costs based on high-volume adoption, not their current incremental costs at low production volumes.

Importance of Dual-Fuel NGVs

Issues Addressed:
- *The impact of the standards on the automobile industry*
- *The feasibility and practicability of the standards*

Dual-fuel NGVs (referred to in the industry as "bi-fuel" NGVs) that operate primarily on CNG but can also operate on gasoline as a backup fuel are likely to play a critical role in winning market adoption of NGVs more broadly. The ability to fuel on gasoline as a backup fuel effectively eliminates consumers' "range anxiety" while CNG fueling infrastructure is not yet as widely available as gasoline, in the same way that dual-fuel electric vehicles (referred to in the industry as plug-in hybrid electric vehicles, or PHEVs) like GM's Chevy Volt have played an important role in expanding the early market for EVs.

The 2017-2025 rulemaking made a major stride towards recognizing the potential benefits of dual-fuel NGVs, which had previously only been assumed to fuel on CNG for 50% of the time. EPA recognized that drivers purchasing dual-fuel NGVs as well as PHEVs are likely to live in areas where fueling (or charging, respectively) infrastructure is reasonably available, and will also preferentially use these alternative fuels whenever possible given their lower cost

[30] Starting the NPC's eight-year projection in 2017 instead of 2012 would imply that an NGV market share of 17 percent could be achieved by 2025 with huge reductions of emissions and petroleum consumption.

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compared to gasoline. Thus, the rules allowed automakers to calculate the fuel usage of both dual-fuel NGVs and PHEVs using a method called the "utility factor" which bases relative consumption of alternative fuels versus gasoline on the vehicle's range on the alternative fuel.[31]

Using this method, a dual-fuel NGV with 250 miles of CNG range – such as the 2015 Dodge Ram[32] – would be assumed to operate on CNG 97.1% of the time, making them nearly as beneficial as a dedicated NGV. PHEVs would receive a similar calculation, although their much shorter all-electric range makes the incentive relatively less beneficial. For example, in the original rulemaking EPA estimated that the Chevy Volt would receive a utility factor of 69% for an all-electric range of 50 miles. [33]

However, despite the fact that utility factors for dual-fuels are ostensibly to be calculated based on their range on alternative fuels, EPA has saddled dual-fuel NGVs with a unique and onerous additional requirement: they must have a CNG range at least double that of their gasoline range in order to qualify for the utility factor calculation, or else they default to an assumed baseline 50% CNG fuel use.[34] Not only that, to be eligible for the incentive, the dual-fuel NGVs must be designed to only use gasoline when the CNG tank is empty.

This requirement is inconsistent with the EPA's assumption that dual-fuel vehicles will fuel as often as possible on CNG for economic reasons, which would imply that their proportion of CNG use should be solely determined by their CNG range according to the utility factors – and not by their gasoline range. Adding further inconsistency, PHEVs face no such requirements, despite the fact of their much more limited all-electric range.

In addition to rendering incentives for dual-fuel NGVs less effective, this requirement adds marketing challenges and, significantly, unnecessary costs to automakers and consumers. To date, the configurations offered by automakers have focused on vehicles that maintain full range on gasoline in order to provide as long of a combined range as possible as well as flexibility; for instance, the dual-fuel GM Silverado has a combined CNG and gasoline range of 650 miles (with the majority coming from gasoline) and allows drivers to switch fuels by flipping a switch.[35]

Beyond unnecessarily restricting customer appeal, the CNG-to-gasoline driving range requirement would require automakers to reduce the size and capacity of the existing gasoline fueling systems in dual-fuel NGVs, which will impose additional costs on manufacturers that will

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[31] *2012 Light Duty GHG Standards* at 62829.
[32] Richard Truett, *Ram will expand lineup of CNG-powered trucks*, AUTOMOTIVE NEWS (Mar. 4, 2015), http://www.autonews.com/article/20150304/OEM05/150309913/ram-will-expand-lineup-of-cng-powered-trucks.
[33] *2012 Light Duty GHG Standards* at 62828.
[34] *Id.* at 62829.
[35] Brandon Turkus, *2015 Chevy Silverado HD gets CNG option*, AUTOBLOG (Feb. 6, 2014), http://www.autoblog.com/2014/02/06/2015-chevrolet-silverado-hd-cng-official/.

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have to be passed on to consumers. Today's dual-fuel pickup truck designs leave the existing gasoline fueling systems intact and simply add CNG storage capacity by placing the CNG tank in the bed of the pickup truck. Downsizing the gasoline fueling system would require additional design, manufacturing, and certification costs that would serve no purpose other than meeting an arbitrary and unnecessary regulatory requirement.

Of course, automakers could also pursue an alternative pathway and maintain the existing gasoline tank size and instead greatly increase CNG fueling capacity. However, this would require tripling or quadrupling the number of CNG tanks currently installed in vehicles like the dual-fuel Dodge Ram, which would add so much weight and take up so much space in the pickup bed that it would be completely unusable for the work fleets that depend on these vehicles. Once again, the current requirement forces automakers to make changes that would increase costs and reduce market acceptance in order to receive full regulatory benefits.

Allowing all NGVs to receive the full utility factor credit for CNG use would remove an unnecessary, ineffective, and arbitrary regulatory impediment to the development of this crucial market segment for stimulating growth in the wider NGV industry.

Summary and Recommendations

Because dual-fuel NGVs are critical for market development and consumer acceptance, and because the agencies should strive to be consistently technology-neutral in their incentives, the unique requirements for dual-fuel NGVs to receive credits based on utility factor calculations should be eliminated.

- Remove the utility factor requirements for a 2:1 ratio of CNG-to-gasoline range, as well as the requirement for dual-fuel NGVs to only use gasoline when the CNG tank is empty.
    - This goal could be achieved by deleting the requirements contained in 40 C.F.R. § 600.510–12, *Calculation of average fuel economy and average carbon-related exhaust emissions*, part (c)(2)(vii)(B) for fuel economy and (j)(2)(vii)(B) for emissions.

Advanced NGV Technologies Promise Best Emissions Path For ICEs

Issues Addressed:

- *The impact of the standards on advanced fuels technology, including but not limited to the potential for high-octane blends*
- *The impact of the standards on compliance with other air quality standards;*
- *The availability of realistic technological concepts for improving efficiency in automobiles that consumers demand, as well as any indirect impacts on emissions;*

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Going beyond today's NGV technology, the agencies should consider the enormous untapped potential of natural gas to deliver even greater environmental and fuel economy benefits in the future. As the highest-octane, cleanest hydrocarbon fuel, natural gas has very favorable physical properties for unsurpassed performance from an internal combustion engine – if automakers are sufficiently incentivized to invest in developing this fuel to its full potential.

Natural gas has 130 octane, far beyond what gasoline – even ethanol-blended gasoline – can provide. In the "Advancing Technologies for America's Transportation Future" study, the NPC projected that this could yield fuel economy up to double that of conventional vehicles when combined with direct injection technologies that fully utilize the properties of CNG.[36] The leading CNG conversion company Westport Innovations is already investigating the potential for natural gas-fueled advanced powertrains that exploit these properties for pickup trucks, with a turbocharged direct injection platform that could reduce carbon emissions by at least 30%.[37]

The potential environmental benefits of CNG aren't limited to greenhouse gases. In 2015, Cummins Westport International (CWI) introduced a heavy-duty CNG engine that was the first engine of any kind to meet the California Air Resources Board (CARB) optional low-NOx emission standard of 0.02 g/bhp-hr NOx – 90% below the 2010 EPA certification level.[38] Owing to the inherently cleaner chemistry of natural gas compared to petroleum-based fuels, similar improvements in performance for NOx emissions could likely be achieved for light-duty vehicles given sufficient automaker interest and investment. While NOx emissions are much lower for gasoline-fueled vehicles compared to diesel vehicles, they are still significant, making this a major untapped opportunity to address smog-forming emissions on our roads.

Agency staff should study the potential of advanced technology to further improve the emissions profile of NGVs, in the same in-depth manner that it has investigated the current and future state of EV and FCV technology. Furthermore, it should incorporate this potential in its assessment of the "game-changing" potential of NGVs as justification for strong incentives.

Summary and Recommendations

[36] Report, NATIONAL PETROLEUM COUNCIL, *Advancing Technology for America's Transportation* (2012), http://www.npc.org/reports/trans.html.
[37] *Methane: The Performance Fuel*, WESTPORT INNOVATIONS (October 2015) https://cleancities.energy.gov/files/u/news_events/document/document_url/128/Brad_Douville__Westport_NGVTF_.pdf
[38] *Game-Changer: Next Generation Heavy Duty Natural Gas Engines Fueled By Renewable Natural Gas*, GLADSTEIN, NEANDROSS AND ASSOCIATES (May 2016), http://ngvgamechanger.com/pdfs/GameChanger_FullReport.pdf

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Because of the high-octane, low-emission properties of natural gas, the agencies should fully study the ability of advanced NGV technologies to further reduce CO2 and smog-forming pollutants and incorporate the results into regulatory incentives and long-term target setting.

- The ability of NGVs to deliver unsurpassed fuel economy for an ICE vehicle should be used as a further rationale for returning to the use of the "0.15 divisor" for calculating NGV emissions, as discussed in the above section on RNG.

"Bridge to Hydrogen" Needed More Than Ever

Issues Addressed:
- *The availability and effectiveness of technology, and the appropriate lead time for introduction of technology*
- *Any relevant information in light of newly available information.*

In awarding advanced technology multiplier incentives to NGVs, the original light-duty vehicle rulemaking in 2012 recognized that there are numerous technical synergies between the development and commercialization of NGVs and hydrogen fuel cell electric vehicles (FCVs) owing to the physical similarities between methane and hydrogen. The agencies wrote that "CNG investments have the potential to facilitate the introduction of hydrogen FCVs in several respects," including innovations in advanced storage materials and tube trailer designs, improved designs for compressors and fuel dispensers, and on-site production of hydrogen from natural gas feedstock. VNG helped to lay out this rationale in a white paper, "NGVs: An Essential Bridge to Hydrogen," commissioned from the consultancy Energy Futures.[39]

Since 2012, the FCV industry has taken its first steps towards commercialization, with Toyota, Honda, and Hyundai each offering models for the U.S. market. The TAR was cautiously optimistic about the uptake of these technologies, with an estimated 125,000 FCVs deployed in California by 2025 thanks to the Zero Emissions Vehicle (ZEV) mandate. However, this does not mean they are fully commercial technologies; indeed, it means that the need for NGV synergies to accelerate the development of this market has been elevated from the realm of the theoretical to the practical. The need is particularly urgent in the area of hydrogen fueling infrastructure, as the TAR estimated that hydrogen fuel demand could begin to outpace infrastructure availability as early as 2019 and as late as 2026.

As noted in the original rulemaking, some of the strongest synergies between these fuels are in the area of infrastructure development. Both CNG and hydrogen fueling stations require the same types of equipment, including compressors, high-pressure storage tanks, and gaseous fuel dispensers. Shared standards, equipment designs, production and operational economies

[39] *Natural Gas: An Essential Bridge to Hydrogen Fuel Cell Vehicles,* ENERGY FUTURES (2011) http://vng.co/wp-content/uploads/2012/05/Natural-Gas-An-Essential-Bridge-To-Hydrogen-Fuel-Cell-Vehicles.pdf

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of scale, and technology innovations in this area could simultaneously drive down costs for both fuels. The September 2014 report "Transitioning the Transportation Sector: Exploring the Intersection of Hydrogen Fuel Cell and Natural Gas Vehicles" by the Sandia National Laboratory[40] goes further, with a concept design for a combined hydrogen and natural gas fueling station that "could improve operational expenditures and also take advantage of common supply chains."

The TAR also noted that "implementation of renewable hydrogen sourcing has posed a financial challenge" for stations developed to date, despite a minimum renewable content of 33% to receive grants from the California Energy Commission and greater incentives for 100% renewable hydrogen stations. RNG is an ideal feedstock for renewable hydrogen production via steam methane reforming (SMR) technology, but the market for FCVs is currently too small to drive widespread development of these resources. As discussed earlier in these comments, increasing the deployment of RNG-fueled NGVs is key to building the market and growing demand for this ultra-low GHG fuel in the near term, ensuring sufficient supplies of RNG for renewable hydrogen production in the longer term.

Finally, these synergies may also yield benefits in the opposite direction, with advances in hydrogen improving the emissions profile of NGVs. The TAR recognizes the potential benefits of power-to-gas applications, in which large-scale wind and solar generation can be used to create hydrogen for blending into natural gas pipelines. While it is discussed in the context of reducing the lifecycle emissions of hydrogen production, this is also clearly relevant to reducing the lifecycle emissions of CNG. The 2013 report "Blending Hydrogen into Natural Gas Pipeline Networks" by the National Renewable Energy Laboratory[41] estimates that natural gas pipelines could accommodate blends of 5-20% hydrogen content with no technical changes by end users (e.g. NGVs), which would not only reduce the overall carbon content of natural gas but also reduce methane leakage from the pipeline system (since hydrogen, as a lighter molecule, would escape from leaks first and 'crowd out' methane).

The NREL report notes that "conceivably, a credit trading system could apply to natural gas with a specified blend content of renewable hydrogen, paralleling the renewable energy credit system used in the electricity sector." In fact, such programs already exist in the transportation sector: the LCFS and RFS programs both allow for the addition of new low-carbon and renewable fuel pathways, and renewable hydrogen-enriched natural gas sold as fuel for NGVs could readily fit within these schema. As with RNG, NGVs can play a crucial role in building this

[40] *Transitioning the Transportation Sector: Exploring the Intersection of Hydrogen Fuel Cell and Natural Gas Vehicles*, SANDIA NATIONAL LABORATORY (2014), https://energy.gov/sites/prod/files/2015/02/f19/2015-01_H2NG-Report-FINAL.pdf

[41] *Blending Hydrogen into Natural Gas Pipeline Networks: A Review of Key Issues*, NATIONAL RENEWABLE ENERGY LABORATORY (2013), http://www1.eere.energy.gov/hydrogenandfuelcells/pdfs/blending_h2_nat_gas_pipeline.pdf

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market in the near term to ensure the availability of renewable, low-emission feedstocks for hydrogen fuel production in the long term.

In all these ways, NGVs could provide much-needed boosts to the development of the FCV industry. On the commercialization side, NGVs will help stimulate adoption of FCVs through lower costs and expanded infrastructure availability, and on the environmental side the expansion of availability of renewable gas feedstocks will maximize the climate benefits of these vehicles. Indeed, NGVs and FCVs should be considered part of the same gaseous fuel pathway and recognized as such in regulations that fully account for and promote the lifecycle benefits of ultra-low GHG gaseous fuel blends.

Summary and Recommendations

The widespread adoption of RNG fueling for NGVs has only increased the synergies between NGVs and FCVs. As such, the agencies should continue to recognize the linkage between these fuels as part of an advanced gaseous fuel pathway for game-changing, long-term emission reductions.

- The mutually-reinforcing ability of both NGVs and FCVs to deliver "game-changing" emission reductions should be used as a further rationale for returning to the use of the "0.15 divisor" for calculating NGV emissions, as discussed in the above section on RNG.

Emissions Solution for Mid-Life Vehicles

Issues Addressed:
- *The impact of the standards on consumer behavior, including but not limited to consumer purchasing behavior and consumer automobile usage behavior.*

Sec. 202(a) of the Clean Air Act requires the agencies to regulate vehicle emissions throughout their useful life, but the current light-duty program only provides incentives for low-emission technologies deployed in *new* vehicles. This is becoming an issue because the past decade has seen a slow, steady increase in the average life of vehicles on our roads, and particularly for light trucks. According to data from the Bureau of Transportation Statistics, the average life of cars on US roads has increased from 9.5 years in 2005 to 11.5 years in 2015[42] - surpassing the 10 year vehicle life currently considered by the agencies.

This trend will likely continue and accelerate if regulations drive up the cost of new vehicles by thousands of dollars, as the agencies themselves have estimated. This will encourage drivers to hold onto their older, less fuel-efficient, and more polluting cars and light trucks for longer and longer, undermining the benefits of the regulations.

[42] *Transportation Energy Databook 2016*, OAK RIDGE NATIONAL LABORATORY, http://cta.ornl.gov/data/index.shtml

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With conventional gasoline cars and trucks, it is essentially impossible to improve the fuel economy and emissions of a given vehicle after it rolls off the assembly line. However, retrofitting existing vehicles to fuel on natural gas has long been a major part of the NGV industry, particularly in states like Oklahoma[43] and Utah[44] that have actively sought to promote the retrofit market. The robust retrofit ecosystem in place for NGVs is fully capable of addressing this market, and the updated certification requirements for remarketed and used vehicles established by EPA in 2012[45] could make this a very cost-effective way to deliver real emissions and petroleum consumption benefits.

While expanding the rules to include emission and petroleum reductions from vehicles that have already been sold is novel, the environmental and energy security benefits that would result are just as meaningful as those stemming from sales of cleaner, more efficient new vehicles.

One way to incentivize retrofits of existing vehicles would be to allow EPA-certified conversion companies to "opt in" to the regulation for the purpose of generating credits for every vehicle they retrofit to operate on natural gas. These credits would be pro-rated based on the vehicle's projected remaining useful life - for instance, a vehicle that is five years old (halfway through the current 10 year/100,000 mile definition of useful life used by the agencies) would receive credits equal to 50% of the emissions benefits of a new NGV, including the "0.15 divisor" and the full-size pickup bonuses proposed in previous sections. The conversion company could then sell the credits to automakers looking to reduce their compliance costs in a given vehicle category.

Incentives for the development of the aftermarket upfit and retrofit ecosystem could also be incorporated into regulations for new vehicles, by including credits for CNG "prep packages" in the off-cycle credit program. For instance, the previously-mentioned 2016 Ford F-150 pickup has a CNG "prep package" including hardened valves, valve seats, pistons and piston rings, which significantly reduces the future cost of upfitting/retrofitting the vehicle for CNG operation.[46] Since this feature increases the likelihood that vehicles will be converted to a low-emission, non-petroleum fuel, it should be included on the off-cycle credit menu.

We encourage the agencies to consider these and other creative solutions to incorporate retrofits and aftermarket upfits into the rules. Doing so would help to counter the environmental and petroleum consumption impacts of increasing vehicle life, encourage closer collaboration between automakers and conversion companies, and improve the rules' cost-effectiveness.

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[43] Jay F. Marks, *CNG vehicle conversion business is booming for Oklahoma company*, THE OKLAHOMAN (Mar. 16, 2012), http://newsok.com/article/3658028.
[44] Clifford Krauss, *Surge in Natural Gas Has Utah Driving Cheaply*, N.Y. TIMES (Aug. 29, 2008), http://www.nytimes.com/2008/08/30/business/30gascars.html.
[45] *Certification and Compliance for Vehicles and Engines*, ENVIRONMENTAL PROTECTION AGENCY, https://www3.epa.gov/otaq/consumer/fuels/altfuels/altfuels.htm.
[46] *First Compressed Natural Gas and Propane-Capable 2016 Ford F-150 Rolls Off The Line At Kansas City*, FORD MOTOR CO. (Dec. 9, 2015), https://media.ford.com/content/fordmedia/fna/us/en/news/2015/12/09/first-compressed-natural-gas-and-propane-capable-2016-ford-f-150.html.

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Summary and Recommendations

NGVs offer a unique, proven pathway to reducing the emissions and petroleum consumption of the existing vehicle fleet, which is likely to be a growing issue as vehicle lifespans continue to be extended. Accordingly, the existing ecosystem of NGV conversion companies (as exemplified by states like Oklahoma and Utah) as well as OEMs should benefit from regulatory incentives for serving this important potential market.

- Allow EPA-certified converters to "opt in" to the program and generate credits for CNG retrofits and upfits that can subsequently be sold to automakers.

- Provide emission credits for CNG "prep packages" that reduce the costs of subsequent conversion to natural gas, as part of the off-cycle credit technologies listed at 40 C.F.R. § 86.1869–12, *CO_2 credits for off-cycle CO_2-reducing technologies.*

Addressing the Threat of Petroleum Dependence

Issues Addressed:

- *The cost on the producers or purchasers of new motor vehicles or new motor vehicle engines*
- *The impact of the standards on consumer behavior, including but not limited to consumer purchasing behavior and consumer automobile usage behavior (e.g. impacts on rebound, fleet turnover, consumer welfare effects, etc.)*
- *The impact of the standards on the automobile industry*

While EPA's emission regulations under the Clean Air Act serve an important purpose, they currently overshadow the original reason that Congress created the CAFE program in 1975: to reduce America's dependence on the petroleum fuels. The Energy Policy and Conservation Act was a direct response by lawmakers to the catastrophic economic and geopolitical effects of the 1973 oil crisis, but this purpose should also be fresh in the minds of today's policymakers and regulators. Like virtually every other economic recession, the oil price spike of 2007 is widely regarded as triggering the Great Recession in 2008, which devastated the global economy and cost over a hundred thousand jobs in the automotive sector as Chrysler and GM went into bankruptcy.[47]

Much more recently, Hurricane Harvey's devastation seriously disrupted the nation's gasoline fuel supplies[48] – a reminder (along with Superstorm Sandy in 2012[49]) that our dependency on one fuel source poses inherent risks beyond political or economic events.

[47] James Hamilton, "Oil Prices and the Economic Downturn." Testimony Prepared for the Joint Economic Committee of the U.S. Congress (May 20, 2009), https://www.jec.senate.gov/public/_cache/files/a6fca8ca-4c4f-4006-bca5-67e972dc19e2/hamilton-testimony.pdf

[48] Gaurav Sharma, *Hurricane Harvey Has Morphed Into A Major U.S. Gasoline Supply Disruption Event*, FORBES (August 28, 2017), https://www.forbes.com/sites/gauravsharma/2017/08/28/hurricane-harvey-has-morphed-into-a-major-u-s-gasoline-supply-disruption-event/#319555b72872

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The U.S. shale oil boom of recent years, while welcome, does not change this near-total dependence on petroleum fuels, nor the associated vulnerabilities. Despite increased production and exports, we still import nearly half of the oil consumed in this country.[50] Moreover, regardless of the degree of oil imports, the TAR acknowledges that "the price impacts of an oil disruption anywhere will continue to be transmitted to U.S. markets"[51] because oil is a global commodity. And Middle East and North African countries – which have triggered 8 of the 10 oil price shocks in history, and face significant threats from the rise of ISIS and Saudi/Iranian tensions – still account for 30% of global production, a share that the TAR expects to rise.[52]

Despite this ever-present danger hanging over our country, and despite the original intent of the CAFE rules, the TAR chapter on energy security acknowledges that the present regulations will barely make a dent in this dependence. In 2025, the TAR projects that U.S. oil imports will be reduced by 169,000 barrels a day thanks to the rules – less than 6% of imports, which will continue to *rise*, not fall. And with sales of EVs and FCVs projected to be less than 2% of the total market as late as 2030[53] - and NGV sales not projected at all – there is no expectation for alternative fuels to break oil's stranglehold on the transportation sector.

This does not have to be the case. As discussed in previous sections, NGVs are a proven, feasible solution for petroleum-free transportation, with 22 million on the road worldwide and currently-untapped potential for mass-market adoption here in America. In terms of a resource base, the shale gas revolution has created an enormous supply of domestic fossil natural gas supplies, and potential sources of RNG are found in communities and farms across the country. With this combination of a market-ready technology and an abundant, cleaner fuel supply, there is no reason for regulators to give up and resign the country to an oil-dependent future.

This is why restoring the "0.15 divisor" calculation for NGV emissions and removing other unreasonable restrictions on NGV incentives, as discussed earlier in these comments, is so important: not only is it justified based on the game-changing environmental benefits of RNG, but it also returns the joint EPA/NHTSA program to Congress's original purpose in passing the Energy Policy and Conservation Act as well as the Alternative Motor Fuels Act. By effectively removing Congress's CAFE incentives for NGVs, the current EPA rules create a conflict between environmental progress and America's energy security that does not need to exist.

Summary and Recommendations

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[49] Kate Zernike, *Gasoline Runs Short, Adding Woes to Storm Recovery,* N.Y. TIMES (Nov 1, 2012) http://www.nytimes.com/2012/11/02/nyregion/gasoline-shortages-disrupting-recovery-from-hurricane.html?pagewanted=all

[50] *How much petroleum does the United States import and export?* ENERGY INFORMATION ADMINISTRATION (April 4, 2017). https://www.eia.gov/tools/faqs/faq.php?id=727&t=6

[51] Draft TAR, 10-22

[52] *Id.*

[53] *Id.,* 13-64

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The current rules fail to meaningfully address the massive risks to America's economic prosperity and security posed by our near-total dependence on petroleum fuels in transportation. NGVs have unsurpassed potential to provide a practical solution to this dependence, but the current EPA rules effectively undercut the original Congressional intent of the CAFE program and later Congressional incentives for NGVs by eliminating the "0.15 divisor" from emission calculations.

- The potential for NGVs to provide a mass-market solution for petroleum dependence is one more reason for pursuing the comprehensive agenda of reform for NGV regulations discussed in these comments – and making these reforms effective immediately.

NGV Reform Needed Today for 2017-2021 Targets

Issues Addressed:

- *Whether the light-duty vehicle greenhouse gas standards established for model year 2021 are appropriate.*

In addition to the MTE's original focus on the 2022-2025 standards, EPA has also requested comments on whether the standards for 2021 remain appropriate. As with the 2025 targets, we believe that automakers can indeed deliver these reductions in emissions as well as petroleum consumption – but only if they are provided with appropriate incentives that recognize the contributions that NGVs make to these goals.

For all of the reasons discussed in previous sections, we believe that the challenges of meeting the targets without NGVs pose a fundamental threat to the economic viability of U.S. automakers, and thus to the hundreds of thousands of jobs that they support. And, while this challenge is likely to become dire by 2025, it is likely that it will begin impacting automakers sooner, and potentially within the 2017-2021 timeframe. Moreover, automakers will need time to ramp up their production of NGVs, and infrastructure developers like VNG will similarly need time to build fueling networks to serve the light-duty market.

Thus, EPA's desire to review the 2021 targets is an excellent opportunity to make the recommended reforms to NGV incentives sooner, rather than waiting until 2022-2025. By reforming NGV incentives effective immediately, the industry will have the regulatory certainty needed to make these long-term investments and get to work right away. Given the importance of reducing the risks of petroleum dependence to our environment and the economy, there is simply no reason to wait.

Summary and Recommendations

Because the current disparity between the treatment of NGVs and EVs is so clearly arbitrary and contrary to real-world lifecycle GHG emissions, and because automakers need this compliance flexibility and regulatory certainty in order to confidently invest in NGV production, a reform of NGV incentives should be made effective immediately – without waiting for the 2022-

VNG

2025 period. EPA's review of the 2021 targets as part of this proceeding is an opportunity to do so.

- In the process of reviewing the 2021 targets, the agencies should adopt the recommended changes to NGV incentives discussed in these comments effective immediately.

Conclusion and Summary of Recommendations

Discussions of the future of automotive emissions are too often characterized by pessimism from all sides. On one hand, environmentalists have pushed for a widespread adoption of EVs that the EPA's own projections (e.g. the TAR) show is decades away, with very limited penetration projected through 2025. On the other hand, the auto industry argues that it has no way to keep consumers from buying larger and more-polluting vehicles, nor any way to cost-effectively reduce their emissions. And those hoping for an end to the U.S.'s decades-long vulnerability to shocks from global oil markets have little hope at all.

This picture is so gloomy because NGVs are wrongly absent from the conversation. Proven, practical NGV technology and RNG fuel can benefit light truck drivers and the environment in the near term at competitive costs, and next-generation NGVs - with high-octane engines fueled by both RNG and hydrogen-enriched gas - have the potential to dramatically improve the trajectory of these vehicles for decades to come. And with America's unrivaled gas resources, NGVs also have the potential to finally break our near-total dependence on petroleum-based fuels with an affordable, cleaner, domestically-abundant fuel.

The MTE is a critical opportunity for the agencies to correct this glaring oversight. By seriously studying the promise of NGVs and by including a robust suite of incentives for their deployment comparable to those provided to EVs, the agencies can offer a compromise to please all sides. The existing targets for 2025 can be maintained as environmentalists wish; automakers can have an expanded set of compliance pathways that address their area of biggest need - light trucks and full-size pickups; and individual consumers get the vehicles they want and need while reducing petroleum dependence and environmental impacts at a reasonable cost.

In doing so, the agencies can deliver a win-win-win for America in line with the "pro-environment, pro-growth" philosophy espoused by this Administration.[54] VNG looks forward to working with the agencies as the MTE process continues to create a final rule that reduces emissions and petroleum dependence while boosting the domestic economy through maximizing our country's unsurpassed traditional fossil and renewable natural gas resources.

[54] *EPA chief: Trump's energy order sends 'pro-growth, pro-environment message'*, Fox News (Mar. 29, 2017), http://www.foxnews.com/politics/2017/03/29/epa-chief-trumps-energy-order-sends-pro-growth-pro-environment-message.html.

VNG

As a final summary, we recommend the following changes to the rules:

- NGV emissions calculations should return to the "0.15" divisor effective immediately, with emissions calculated as 85% below a gasoline vehicle. This is both justified by the real-world emissions benefits of RNG and is consistent with the CAFE program. The potential for future improvements to NGV emissions from advanced engine technologies, as well as synergies with hydrogen FCVs, provides further justification for this incentive.
    - We recommend reinstating language from the MY 2011-2016 regulations under 40 C.F.R. § 600.510–12, *Calculation of average fuel economy and average carbon-related exhaust emissions*: "For natural gas-fueled model types . . . the carbon-related exhaust emissions value calculated for that model type in accordance with paragraph (b)(2) of this section multiplied by 0.15 and rounded to the nearest gram per mile, except that manufacturers complying with the fleet averaging option for N_2O and CH_4 as allowed under § 86.1818 of this chapter must perform this calculation such that N_2O and CH_4 values are not multiplied by 0.15."
- Offer a "Natural Gas Pickup" incentive similar to current hybrid-electric and "performance-based" pickup credits; however, for the natural gas pickup credit, minimum deployment thresholds should be eliminated to reflect the greater market challenges faced by NGVs - since, unlike hybrid-electrics, they use an alternative fuel.
    - This goal could be accomplished by inserting a new section (c) under 40 C.F.R. § 86.1870–12, *CO_2 credits for qualifying full-size pickup trucks*, titled "Credits for implementation of natural gas technology." The structure of these credits would be similar to those for sections (a) and (b), but with reduced or eliminated requirements for the "required minimum percent of full size pickup trucks."
- Remove the utility factor requirements for a 2:1 ratio of CNG-to-gasoline range, as well as the requirement for dual-fuel NGVs to only use gasoline when the CNG tank is empty.
    - This could be achieved by deleting the requirements in 40 C.F.R. § 600.510–12, *Calculation of average fuel economy and average carbon-related exhaust emissions*, part (c)(2)(vii)(B) for fuel economy and (j)(2)(vii)(B) for emissions.
- Incorporate the potential for use of natural gas when setting targets for practical, achievable emissions improvements for light trucks and full-size pickups. Modeling used to set achievable emissions curves for pickups and light trucks should include natural

gas as a proven technology at costs based on high-volume adoption, not their current incremental costs at low production volumes.

- Allow EPA-certified converters to "opt in" to the program and generate credits for CNG retrofits and upfits that can subsequently be sold to automakers.

- Provide emission credits for CNG "prep packages" that reduce the costs of subsequent conversion to natural gas, as part of the off-cycle credit technologies listed at 40 C.F.R. § 86.1869–12, *CO_2 credits for off-cycle CO_2-reducing technologies.*

Respectfully submitted,

Robert C. Atkinson
Chief Regulatory Officer
VNG.co LLC
rcatkinson@vng.co
908-447-4201

Appointment

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 11/30/2017 8:45:11 PM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Burch, Julia [Burch.Julia@epa.gov]; Charmley, William [charmley.william@epa.gov]; Moran, Robin [moran.robin@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Simon, Karl [Simon.Karl@epa.gov]
CC: Alson, Jeff [alson.jeff@epa.gov]

Subject: Meet with Toyota re: MidTerm Review (MTR) for autos/light duty trucks (Confirmed)
Attachments: RE: Meeting Requests for Toyota ; FW: Meeting Requests for Toyota from S. Fotis; Confirmed 12/15 at 3pm: Meeting Requests for Toyota from S. Fotis; Confirmed 1/23/18 at 10am: Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis; RE: Rescheduling Meeting with USEPA's Bill Wehrum and Toyota from S. Fotis
Location: WJC-N 5400 + Video with AA + Dial: Ex. 6 Personal Privacy (PP)

Start: 1/23/2018 4:00:00 PM
End: 1/23/2018 4:45:00 PM
Show Time As: Busy

To: Bill Wehrum, Chris Grundler, Ben Hengst, Julia Burch, Bill Charmley, Robin Moran, Mike Olechiw and Karl Simon
Outside Attendees (in person):

- Tom Stricker, Vice President, Technical and Regulatory Affairs, Toyota
- Fred Turatti, General Manager, Toyota Motor North America
- Rick Gezelle, Manager, Technical and Regulatory Affairs
- Andrea Campbell, Van Ness Feldman, legal counsel for Toyota

RE: Meeting Requests for Toy... | FW: Meeting Requests for Toy... | Confirmed 12/15 at 3pm: Meeting Re... | Confirmed 1/23/18 at 10am: Meetin... | RE: Rescheduling Meeting with US...

Appointment

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 2/5/2018 5:54:58 PM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Cook, Leila [cook.leila@epa.gov]; Charmley, William [charmley.william@epa.gov]
CC: Moran, Robin [moran.robin@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Simon, Karl [Simon.Karl@epa.gov]

Subject: Meet with Alliance for Vehicle Efficiency (Confirmed)
Attachments: FW: Meeting Request (2-20-2018) with Asst. Adm. Wehrum; Confirmed 2/20 at 10am: Meeting Request (2-20-2018) with Asst. Adm. Wehrum
Location: WJC-N 5400 + Video with Ann Arbor Room C174

Start: 2/20/2018 3:00:00 PM
End: 2/20/2018 3:45:00 PM
Show Time As: Busy

Re: MTE
To: Bill Wehrum, Mandy Gunasekara, Chris Grundler, Ben Hengst, Lee Cook, Bill Charmley
Outside Attendees (in person): TBD

FW: Meeting Request (2-20-2...

Confirmed 2/20 at 10am: Meeting R...

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/5/2018 7:40:36 PM
To: Lee Janger [lee@armitagellc.com]
Subject: Confirmed 2/20 at 10am: Meeting Request (2-20-2018) with Asst. Adm. Wehrum

Hi Lee,
You are confirmed for 45 minute meeting on Tuesday, February 20, 2018 at 10:00am with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.
Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lee Janger [mailto:lee@armitagellc.com]
Sent: Monday, February 05, 2018 12:58 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Meeting Request (2-20-2018) with Asst. Adm. Wehrum

Emily,

That works great on our end. Thank you very much for making these arrangements. I will make sure to reach out a few days beforehand to brief you on attendees and materials to be discussed.

Best regards,
-Lee

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Monday, February 05, 2018 12:53 PM
To: Lee Janger <lee@armitagellc.com>
Subject: FW: Meeting Request (2-20-2018) with Asst. Adm. Wehrum

Hi Lee,

It looks like Bill Wehrum and Mandy Gunasekara could be available for a 45 minute meeting on Tuesday, February 20, 2018 at 10:00am.

Please advise if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lee Janger [mailto:lee@armitagellc.com]
Sent: Friday, February 02, 2018 2:19 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Meeting Request (2-20-2018) with Asst. Adm. Wehrum

Ms. Atkinson,

Thank you so much for taking the time to speak with me just now. This email is a follow up on to our brief discussion.

I represent a group of large auto suppliers (BorgWarner, Honeywell, Bosch, and others). Our focus is on advanced powertrain and emission control technologies. We advocate for technology neutral standards that encourage and support innovation across the auto industry.

We are very interested in speaking with Assistant Administrator Wehrum and others in the Office of Air and Radiation regarding the Midterm Evaluation (MTE). In response to the anticipated review, we have prepared data that we believe will assist EPA with their review of the appropriateness of the emissions standards for vehicle model years 2022-2025.

A few months ago, we had a great meeting with Mike Catanzaro at the White House, and after learning about our data review, strongly urged us to meet with your office to discuss our concerns on long term certainty, job growth and future technology investments as these are some of the key factors being looked at for the MTE.

As we finalize our data, I am hoping to arrange a meeting with Mr. Wehrum for **the late morning of February 20th** while many of members will be in Washington, DC. Please let me know if a meeting at that time is possible. We would likely be a group of 5-6 people.

More information on our group can be found at www.VehicleEfficiency.com Please let me know if I can provide any additional information. My contact information is also below.

Thank you again for your time and help.
-Lee

Alliance for Vehicle Efficiency

Lee J. Janger
Director, Legislative and Regulatory Affairs
202.607.0723
Lee@ArmitageLLC.com

>www.VehicleEfficiency.com<

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Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/2/2018 7:23:45 PM
To: Lewis, Josh [Lewis.Josh@epa.gov]
Subject: FW: Meeting Request (2-20-2018) with Asst. Adm. Wehrum

Meeting request for Bill

From: Lee Janger [mailto:lee@armitagellc.com]
Sent: Friday, February 02, 2018 2:19 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Meeting Request (2-20-2018) with Asst. Adm. Wehrum

Ms. Atkinson,

Thank you so much for taking the time to speak with me just now. This email is a follow up on to our brief discussion.

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A few months ago, we had a great meeting with Mike Catanzaro at the White House, and after learning about our data review, strongly urged us to meet with your office to discuss our concerns on long term certainty, job growth and future technology investments as these are some of the key factors being looked at for the MTE.

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More information on our group can be found at www.VehicleEfficiency.com Please let me know if I can provide any additional information. My contact information is also below.

Thank you again for your time and help.
-Lee

Alliance for Vehicle Efficiency

Lee J. Janger
Director, Legislative and Regulatory Affairs
202.607.0723
Lee@ArmitageLLC.com

>www.VehicleEfficiency.com<

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Appointment

From: Atkinson, Emily [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=BB2155ADEF6A44AEA9410741F0C01D27-ATKINSON, EMILY]
Sent: 2/5/2018 5:50:29 PM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]; Gunasekara, Mandy [Gunasekara.Mandy@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Cook, Leila [cook.leila@epa.gov]; Charmley, William [charmley.william@epa.gov]
CC: Moran, Robin [moran.robin@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Caffrey, Cheryl [caffrey.cheryl@epa.gov]

Subject: Meet with Aluminum Association - Aluminum Transport Group Members (Confirmed)
Attachments: Aluminum Association Meeting Request; Confirmed 3/2 at 3pm: Aluminum Association Meeting Request; Confirmed 3/1 at 4pm: Aluminum Association Meeting Request; RE: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request
Location: WJC-N 5400 + Video with AA

Start: 3/1/2018 9:00:00 PM
End: 3/1/2018 9:45:00 PM
Show Time As: Busy

Re: automotive GHG emissions and fuel economy regulations
To: Bill Wehrum, Mandy Gunasekara, Chris Grundler, Ben Hengst, Lee Cook, Bill Charmley
Outside Attendees (in person):

- Henry Gordinier, Tri-Arrows
- Ganesh Panneer, Novelis
- Delphine Dahan-Kocher, Constellium
- Dan Minwell, Constellium
- Mario Greco, Arconic
- Mike Belwood, Arconic
- Joe Quinn, Aluminum Association
- Matt Meenan, Aluminum Association
- John Fitzpatrick, Stratacomm

Aluminum Association Meet... | Confirmed 3/2 at 3pm: Aluminum ... | Confirmed 3/1 at 4pm: Aluminum ... | RE: Confirmed 3/1 at 4pm: Aluminu...

Message

From: Lauren Wilk [lwilk@aluminum.org]
Sent: 2/28/2018 3:13:28 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]
CC: Matt Meenan [mmeenan@aluminum.org]
Subject: RE: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request

Hi, Emily. I wanted to send you a list of attendees for tomorrow's meeting at EPA. My colleague Matt Meenan (copied here) will be with the group, if you need to reach him for any reason. Please let me know if you need any additional information from me in advance of the meeting.

- Henry Gordinier, Tri-Arrows
- Ganesh Panneer, Novelis
- Delphine Dahan-Kocher, Constellium
- Dan Minwell, Constellium
- Mario Greco, Arconic
- Mike Belwood, Arconic
- Joe Quinn, Aluminum Association
- Matt Meenan, Aluminum Association
- John Fitzpatrick, Stratacomm

Much appreciated!

Lauren

The Aluminum Association
Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, February 07, 2018 3:02 PM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request

Hi Lauren,
You are confirmed for 45 minute meeting on Thursday, March 1, 2018 at 4:00pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

> Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

Security Procedures: A government issued photo id is required to enter the building and it is suggested you arrive 15 minutes early in order to be cleared and arrive at the meeting room on time. Upon entering the lobby, the meeting attendees will be asked to pass through security and provide a photo ID for entrance. Let the guards know that you were instructed to call 202-564-7404 for a security escort.

Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Wednesday, February 07, 2018 2:59 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Thanks so much, Emily. That's perfect.

I'll circle back, closer to the meeting, with a list of attendees. Let me know if you need anything else in the meantime.

Lauren

The Aluminum Association
Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, February 07, 2018 12:33 PM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi Lauren,

It looks like we could fit this in on Thursday, March 1 at 4:00pm. Let me know if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Wednesday, February 07, 2018 11:01 AM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi, Emily. One of the technical experts I was hoping to bring in for our meeting with Mr. Wehrum will unfortunately be out of the country on Friday 3/2. Is there any chance that Mr. Wehrum would be available to meet on Thursday 3/1, or sometime March 12-16? If not, we'll keep our March 2 meeting and I'll have my colleague prepare his technical materials in advance.

Thanks so much,

Lauren

The Aluminum Association
Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Tuesday, February 06, 2018 9:25 AM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Hi Lauren,

Yes, we could accommodate a group of 8 attending this meeting.

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA

Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Monday, February 05, 2018 2:52 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: Re: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

Thanks, Emily. I appreciate your help in getting this nailed down.

I would like to invite a few member company representatives to join, so I'm curious if there's a hard limit on number of attendees — would 6-8 (as a total group size) be workable?

Best,

Lauren

Lauren Wilk
The Aluminum Association
Office: (703) 358-2981

On Mon, Feb 5, 2018 at 2:38 PM -0500, "Atkinson, Emily" <Atkinson.Emily@epa.gov> wrote:

Hi Lauren,
You are confirmed for 45 minute meeting on Friday, March 2, 2018 at 3:00pm with Bill Wehrum.
Directions and procedures to 1200 Pennsylvania Avenue NW:

Metro: If you come by Metro get off at the Federal Triangle metro stop. Exit the metro station and go up two sets of escalators to the surface level and turn right. You will see a short staircase and wheelchair ramp leading to a set of glass doors with the EPA logo - that is the William Jefferson Clinton Federal Building, North Entrance.

Taxi: Direct the taxi to drop you off on 12th Street NW, between Constitution and Pennsylvania Avenues, at the elevator for the Federal Triangle metro stop - this is almost exactly half way between the two avenues on 12th Street NW. Facing the building with the EPA logo and American flags, walk toward the building and take the glass door on your right hand side with the escalators going down to the metro on your left – that is the North Lobby of the William Jefferson Clinton building.

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Please send me a list of participants in advance of the meeting and feel free to contact me should you need any additional information.

Emily

Emily Atkinson
Management Analyst/Office Manager

Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Monday, February 05, 2018 12:56 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Aluminum Association Meeting Request

Thanks, Emily. We'll take the meeting on March 2 at 3pm, and I'll firm up attendees on our end.

Let me know what details you need in advance of the meeting.

Much appreciated!

Lauren

The Aluminum Association

Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Monday, February 05, 2018 12:48 PM
To: Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Aluminum Association Meeting Request

Hi Lauren,

It looks like Bill Wehrum could be available for a 45 minute meeting on Friday, March 2, 2018 at 3:00pm.

Please advise if this could work on your end.

Emily

Emily Atkinson
Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
Office of Air and Radiation, USEPA
Room 5412B, 1200 Pennsylvania Avenue NW
Washington, DC 20460
Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Thursday, February 01, 2018 12:06 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Aluminum Association Meeting Request

Emily and Josh –

Will Lovett suggested I connect with you on scheduling a meeting with Assistant Administrator Wehrum for a few representatives of the aluminum industry. We have availability on the following dates: February 16, 20, 21, 23, 26, 27, 28 or March 1 (but we can certainly be flexible if an alternative date is necessary).

The Aluminum Association is active with EPA on a number of issues – and specifically, the members of our Aluminum Transportation Group (ATG) would very much like to hear directly from Mr. Wehrum about the Administration's priorities related to automotive GHG emissions and fuel economy regulations. The ATG represents the Association's member companies that produce aluminum for use in cars and trucks, including Alcoa, Arconic, Novelis, Rio Tinto and others.

The aluminum industry plays a significant role in the automotive supply chain, and the pounds of aluminum content per vehicle has grown by more than 30 percent over the past decade. Driven by that auto sector growth, the aluminum industry has announced or completed U.S. plant expansions and investments of more than $2.6 billion since 2013. Already this year, Novelis announced that it was investing $300 million in a new greenfield automotive finishing facility in Guthrie, Kentucky. The industry is acutely interested in the outcome of the midterm review on vehicle fuel economy, and we have met previously with the White House, OMB, NHTSA, CARB and others on this topic.

I'd be happy to answer any questions or provide additional background, if that's helpful.

Thanks so much,

Lauren

The Aluminum Association
Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 Ex. 6 Personal Privacy (PP) | F 703.358.2961
JOIN THE CONVERSATION:

Message

From: Laurie Holmes [lholmes@mema.org]
Sent: 1/11/2018 6:32:28 PM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]
CC: Catherine Boland [cboland@MEMA.ORG]
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Bill:
MEMA would like to request a meeting to discuss the midterm evaluation on the vehicle greenhouse gas emission standards.

MEMA represents more than 1,000 companies that manufacture components, systems and materials for motor vehicles and represents the largest sector of manufacturing jobs in the U.S. Since auto suppliers play a major role in developing the technologies necessary for vehicle emission reduction, suppliers have a strong interest in the midterm evaluation and the standards. Our position is also not identical to the vehicle manufactures on the issue.

It would be helpful if we could discuss with you the impact the program has had and will have on our industry.

Look forward to hearing from you.

Laurie Holmes
Senior Director, Environmental Policy
Motor & Equipment Manufacturers Association
1030 15th Street NW, Suite 500 East
Washington, DC 20005
Direct: 202-312-9247
Ex. 6 Personal Privacy (PP)

2018
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April 10-11 | Washington, DC
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Message

From: Robbie Diamond [RDiamond@secureenergy.org]
Sent: 3/1/2018 5:54:58 PM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]
CC: Joseph Ryan [JRyan@secureenergy.org]; chuckc@visi.net
Subject: Smith and Conway in Washington Examiner: Trump can defend America's renewed economic growth, improve fuel standards
Attachments: Examiner Smith Conway oped.pdf

Bill,

It was great meeting last week. I wanted to share an oped in this morning's *Washington Examiner* by Frederick W. Smith, Chairman and CEO of FedEx, and General James T. Conway, 34th Commandant of the US Marine Corps, making the argument for one national program with a reformed fuel economy system that benefits the industry, the environment, our economy, and our national security.

Ken Blackwell, former Trump Transition Leader and Ohio Secretary of State had an oped in the Daily Caller and Townhall Gas Prices v. Tax Cuts: How Trump Can Protect His Signature Achievement which was covered in Inside Sources: Trump Transition Team Member Warns Gas Prices Threaten Tax Cuts

As I think I mentioned last week, we will be publishing a study in the coming weeks that shows current connected and other advanced technologies can improve fuel economy by 18% to 25% while saving lives.

Best regards,
Robbie

http://www.washingtonexaminer.com/trump-can-defend-americas-renewed-economic-growth-improve-fuel-standards/article/2650302

WASHINGTON Examiner

Trump can defend America's renewed economic growth, improve fuel standards

by Frederick W. Smith and James T. Conway
Mar 1, 2018

To maintain and produce meaningful economic growth, President Trump must reform and strengthen the fuel economy standards of our cars and trucks. This action would have the secondary effect of unleashing revolutionary, American-made innovations in transportation technology.

As the CEO of a Fortune 500 company and a former commandant of the Marine Corps, we are all too familiar with the economic and national security impacts of oil, and the urgent need for action. Unfortunately, the last time Americans received tax cuts, the benefits were wiped out by oil price spikes — one of countless examples of the economic risks associated with oil dependence. The cumulative impact of the Bush-era tax cuts from 2001 to 2008 increased household income by $1,900, yet household spending on gasoline increased by $2,000 in the same period. Similarly, in 2011, record gasoline prices cost American households an additional $104 billion compared to 2010, offsetting the $108 billion in additional take-home pay from the Obama-era payroll tax cut.

The Trump administration has an opportunity, with its recent passage of the Tax Cut and Jobs Act, to avoid these past mistakes.

Exposure to oil price volatility also undermines our national sovereignty, granting foreign powers leverage over the U.S. economy and shifting our global priorities. Fuel economy is a national security policy designed to limit the use of oil as a weapon against American interests, enacted after the 1973 OPEC oil embargo drove the U.S. economy into recession. If cars today had the same fuel economy as cars in 1974, and accounting for an increase in vehicle miles traveled, we would consume almost 7 million barrels per day more gasoline than we now consume.

Despite these improvements and even as the unconventional oil and gas innovators in our heartland have transformed energy production, the U.S. remains vulnerable to oil price volatility. Oil is priced globally, and a disruption anywhere causes a price spike everywhere. No matter the level of domestic production, chronically unstable OPEC states hold some 73 percent of global reserves. Unlike power generation, the transportation sector lacks fuel diversity, meaning consumers and businesses have no choice about the fuels they wish to use – a challenge that becomes evident when gasoline prices rise.

The reopening of the midterm evaluation of fuel efficiency standards has created an opportunity to strengthen and modernize the fuel economy regime. As technology offers a possible transition to autonomous, electric vehicles by the 2030s, regulators should look to accelerate the future rather than onerously regulate the status quo. The federal government and California can thus join together to leverage emerging technologies to maximize long-term reductions in oil demand.

On the other hand, the downside risk is severe. A departure between federal and California standards would result in a protracted legal battle that creates regulatory uncertainty and wastes the automotive industry's time and money while failing to advance the nation's interests.

The overall deal should set a strong fuel economy goal out to 2030 or even 2035 in exchange for adjustment on near-term stringency and flexibility. This will give automakers the long-term certainty that will help them invest in technology packages today that align with that future goal.

Most importantly, Washington can simultaneously increase fuel economy savings today and in the coming years by addressing structural deficiencies in the "off-cycle" credit program, which allows automakers to gain credits for improvements undertaken outside the government's standard testing protocols. Expanding the "menu" of predefined credits, as well as streamlining the application process as technologies emerge, will benefit industry, the environment, and our national security.

These changes should unleash emerging technologies and businesses models that can verifiably save fuel while helping automakers compete during a period of rapid, unprecedented technological change. This approach could include, for example, congestion- and accident-reducing technologies on the market today, such as advanced driver assistance systems, ADAS, which include adaptive cruise control and lane-keeping, as well as connectivity systems. As accident-related congestion in the U.S. wastes nearly one billion gallons of fuel annually, savings through these technologies could be significant.

Through these reforms, President Trump's administration and the state of California can increase wealth for the nation and continue American leadership in advanced technology. Our recent economic growth must not suffer from oil price volatility as it did under previous presidents. A good deal on fuel economy is both possible and serves the long-term interests of the American people.

Frederick W. Smith is Chairman and CEO of FedEx Corporation, and retired Gen. James T. Conway, USMC, served as the 34th Commandant of the Marine Corps. Together, they serve as the co-chairs of the Energy Security Leadership Council (ESLC), a project of Securing America's Future Energy (SAFE)

http://www.washingtonexaminer.com/trump-can-defend-americas-renewed-economic-growth-improve-fuel-standards/article/2650302

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On the other hand, the downside risk is severe. A departure between federal and California standards would result in a protracted legal battle that creates regulatory uncertainty and wastes the automotive industry's time and money while failing to advance the nation's interests.

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http://www.washingtonexaminer.com/trump-can-defend-americas-renewed-economic-growth-improve-fuel-standards/article/2650302

Message

From: Lauren Wilk [lwilk@aluminum.org]
Sent: 1/31/2018 3:20:12 PM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]
Subject: Aluminum Association / Meeting Request

Mr. Wehrum:

I wanted to take a moment to introduce myself, and to request a meeting with you in the coming weeks.

I recently joined the Aluminum Association from the NAM, and the Association is active with EPA on a number of issues – as an energy-intensive industry with growing demand and a strong story on innovation and sustainability, we have a stake in a range of EPA regulations. Specifically, the members of our Aluminum Transportation Group (ATG) would very much like to hear directly from you about the Administration's priorities related to automotive GHG emissions and fuel economy regulations. The ATG represents companies that make aluminum for use in cars and trucks, including Alcoa, Arconic, Novelis, Rio Tinto and others.

As you might know, the aluminum industry plays a significant role in the automotive supply chain. Pounds of aluminum content per vehicle has grown by more than 30 percent over the past decade, and the aluminum industry has announced or completed U.S. plant expansion investments of more than $2.6 billion since 2013 to support this growth. Just this month, Novelis announced that it was investing $300 million in a new greenfield automotive finishing facility in Guthrie, Kentucky, to support the growth in the auto sector. As a key supplier to the auto sector, the industry is acutely interested in the outcome of the midterm review on vehicle fuel economy.

The ATG has met previously with the White House, OMB, NHTSA, CARB and others on this topic, and we'd propose a meeting with you on one of the following dates: February 16, 20, 21, 23, 26, 27, 28 or March 1. We can certainly be flexible if an alternative date is available, though.

Thanks so much,

Lauren

The Aluminum Association
Lauren Wilk
Vice President, Policy & International Trade
The Aluminum Association
1400 Crystal Drive, Suite 430
Arlington, VA 22202
T 703.358.2981 Ex. 6 Personal Privacy (PP) F 703.358.2961
JOIN THE CONVERSATION:

Message

From: Laurie Holmes [lholmes@mema.org]
Sent: 1/12/2018 3:55:34 PM
To: Wehrum, Bill [Wehrum.Bill@epa.gov]
CC: Catherine Boland [cboland@MEMA.ORG]; Lewis, Josh [Lewis.Josh@epa.gov]
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Bill, Thank you so much.
Josh, Look forward to hearing from you.

From: Wehrum, Bill [mailto:Wehrum.Bill@epa.gov]
Sent: Friday, January 12, 2018 7:38 AM
To: Laurie Holmes <lholmes@mema.org>
Cc: Catherine Boland <cboland@MEMA.ORG>; Lewis, Josh <Lewis.Josh@epa.gov>
Subject: Re: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Hi Laurie. I'd be happy to talk with you. I've copied my chief of staff, Josh Lewis, who can help coordinate.

_____
Bill Wehrum
Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency
(202) 564-7404

On Jan 11, 2018, at 1:33 PM, Laurie Holmes <lholmes@mema.org> wrote:

> Bill:
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>
> MEMA represents more than 1,000 companies that manufacture components, systems and materials for motor vehicles and represents the largest sector of manufacturing jobs in the U.S. Since auto suppliers play a major role in developing the technologies necessary for vehicle emission reduction, suppliers have a strong interest in the midterm evaluation and the standards. Our position is also not identical to the vehicle manufactures on the issue.
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> Look forward to hearing from you.
>
> Laurie Holmes
> Senior Director, Environmental Policy
> Motor & Equipment Manufacturers Association
> 1030 15th Street NW, Suite 500 East
> Washington, DC 20005
> Direct: 202-312-9247
> Ex. 6 Personal Privacy (PP)
> <image001.png>

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Message

From: Wehrum, Bill [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=33D96AE800CF43A3911D94A7130B6C41-WEHRUM, WIL]
Sent: 1/12/2018 12:37:42 PM
To: Laurie Holmes [lholmes@mema.org]
CC: Catherine Boland [cboland@MEMA.ORG]; Lewis, Josh [Lewis.Josh@epa.gov]
Subject: Re: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

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Assistant Administrator
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