Message

From: Laurie Holmes [lholmes@mema.org]
Sent: 1/17/2018 3:33:36 PM
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

Appointment

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 12/13/2017 2:05:22 PM
To: Cyran, Carissa [Cyran.Carissa@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]; Loving, Shanita [Loving.Shanita@epa.gov]; Atkinson, Emily [Atkinson.Emily@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 + [redacted]

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

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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,

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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

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Cc: Loving, Shanita <Loving.Shanita@epa.gov>
Subject: RE: Request for Meeting

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Cc: Loving, Shanita
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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 [Atkinson.Emily@epa.gov]
Sent: 1/18/2018 8:45:17 PM
To: Lewis, Josh [Lewis.Josh@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Atkinson, Emily [Atkinson.Emily@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
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

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
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: Tucker, Jamie [jtucker@AKINGUMP.COM]
Sent: 1/10/2018 3:32:39 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]
Subject: RE: Confirmed 1/30 at 4pm: Meeting Request re: Natural Gas Vehicles

Thanks again!

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.

Appointment

From: Lewis, Josh [Lewis.Josh@epa.gov]
Sent: 12/13/2017 12:32:33 PM
To: Cyran, Carissa [Cyran.Carissa@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]; Loving, Shanita [Loving.Shanita@epa.gov]; Atkinson, Emily [Atkinson.Emily@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 +[redacted]

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.

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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
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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

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Washington, DC 20004-1304
Direct: +1.202.654.7119

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Message

From: Laurie Holmes [lholmes@mema.org]
Sent: 2/5/2018 2:45:46 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]
Subject: Re: Auto Suppliers Meeting on the Midterm Evaluation for Vehicle GHG Standards

Great, thank you! The meeting is scheduled for 4:15 right?

Sent from my iPhone

On Feb 5, 2018, at 9:33 AM, Atkinson, Emily <Atkinson.Emily@epa.gov> wrote:

Hi Laurie,

Yes, below is a call in number and we will open the line for today's 4pm meeting. See the rest of the group later today.

[redacted]

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: Monday, February 05, 2018 9:19 AM
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
<image001.png>
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.
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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
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

2018 LEGISLATIVE SUMMIT

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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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

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Sent from my iPhone

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> **Subject:** Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards
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> **To:** Laurie Holmes <lholmes@mema.org>; Catherine Boland <cboland@MEMA.ORG>
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> **Subject:** FW: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards
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> + Emily and – Bill.
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> Josh Lewis
> Chief of Staff

EPA/Office of Air and Radiation
Office: 202 564 2095
Cell: 202 329 2291

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Sent: Friday, January 12, 2018 10:56 AM
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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

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Josh, Look forward to hearing from you.

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Sent: Friday, January 12, 2018 7:38 AM
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Cc: Catherine Boland <cboland@MEMA.ORG>; Lewis, Josh <Lewis.Josh@epa.gov>
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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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> Laurie Holmes
> Senior Director, Environmental Policy
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> 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

Appointment

From: Lewis, Josh [Lewis.Josh@epa.gov]
Sent: 12/13/2017 12:32:33 PM
To: Lewis, Josh [Lewis.Josh@epa.gov]; Loving, Shanita [Loving.Shanita@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Cyran, Carissa [Cyran.Carissa@epa.gov]; Atkinson, Emily [Atkinson.Emily@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 +[redacted]

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:

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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

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

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Washington, DC 20004-1304
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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 [Atkinson.Emily@epa.gov]
Sent: 1/10/2018 1:48:51 PM
To: Lewis, Josh [Lewis.Josh@epa.gov]; Loving, Shanita [Loving.Shanita@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Cyran, Carissa [Cyran.Carissa@epa.gov]; Atkinson, Emily [Atkinson.Emily@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
Location: WJC-N 5400

Start: 1/30/2018 9:00:00 PM
End: 1/30/2018 9:45:00 PM
Show Time As: Tentative

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): TBD

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.

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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
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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
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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.

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
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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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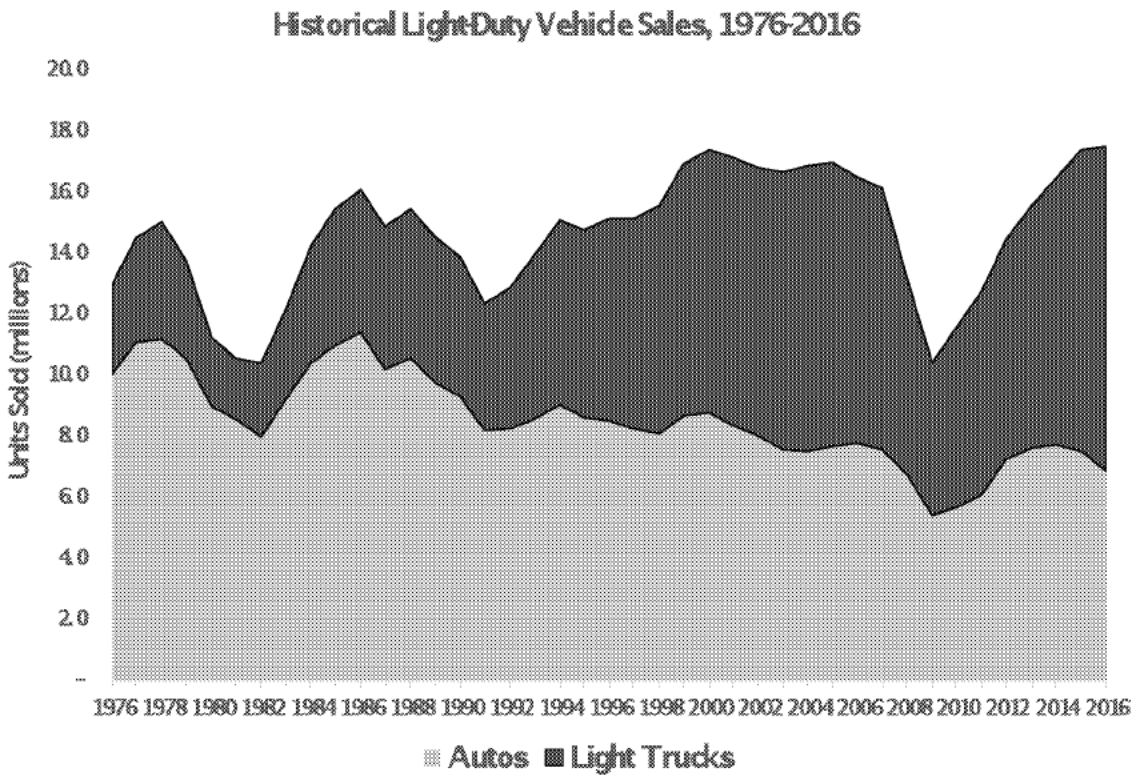
The Need for Light Truck Alternatives in a Changing Market Context

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

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.

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.

- 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:

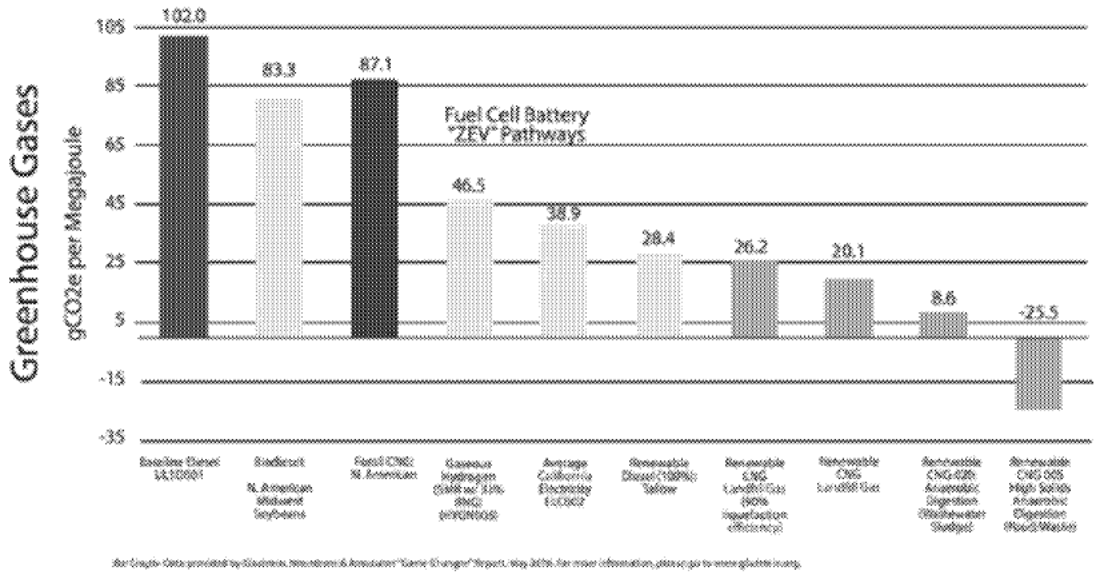
- *The availability and effectiveness of technology, and the appropriate lead time for introduction of technology*
- *Any relevant information in light of newly available information.*
- *The impact of the greenhouse gas emission standards on the Corporate Average Fuel Economy standards and a national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



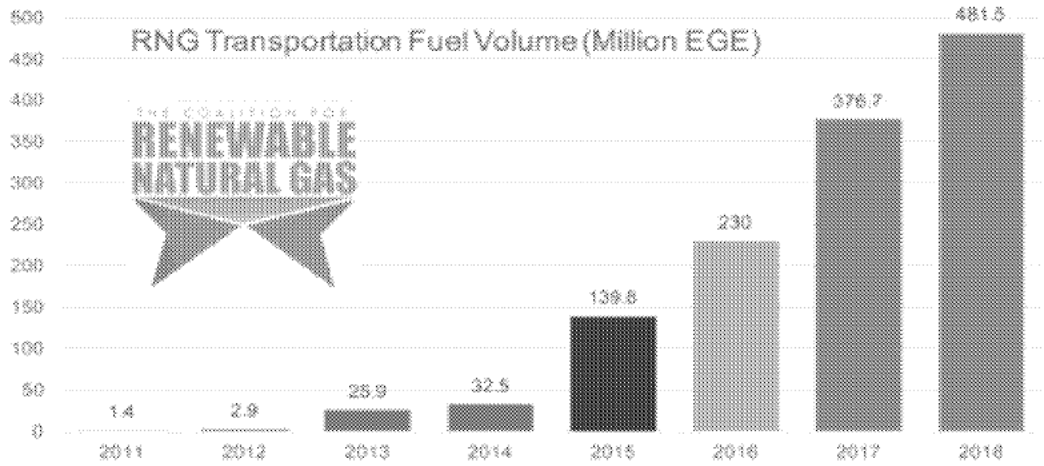
Source: Gladstein, Neandross & Associates[12]

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.

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.

- 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*

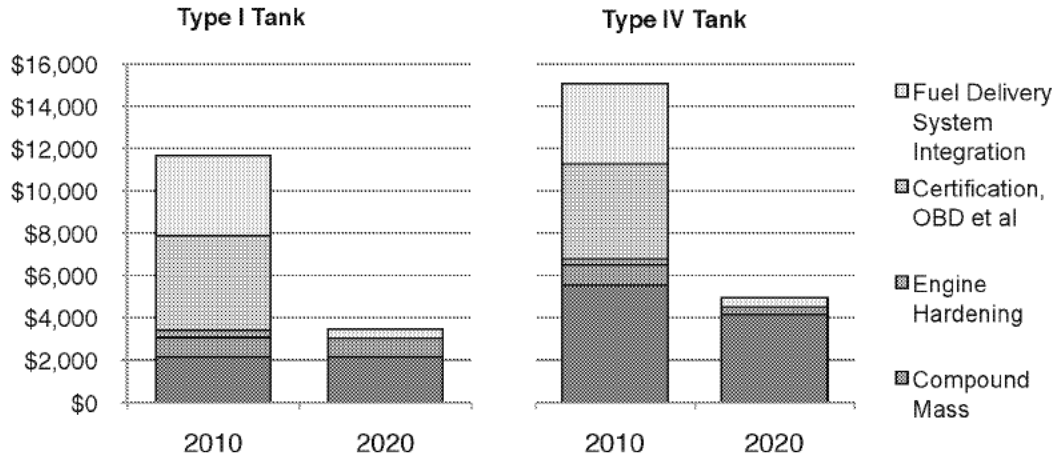
As part of a shift towards a serious analysis of NGVs in the MTE, the agencies must consider not only the current costs of NGVs but their potential for very rapid cost reductions with production at scale. Indeed, while the current incremental prices of CNG pickups are typically $10,000 or more (including 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.*

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/.

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;*

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

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[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

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

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

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.

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

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

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.

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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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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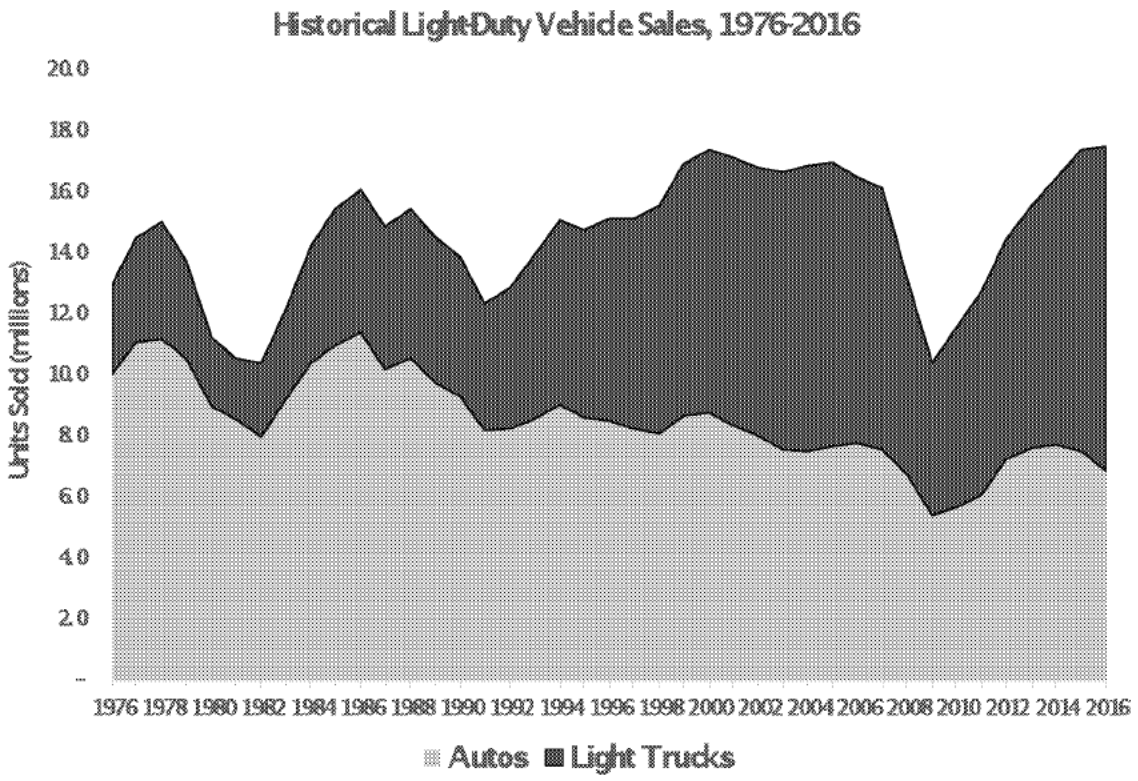
The Need for Light Truck Alternatives in a Changing Market Context

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

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.

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.

- 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:

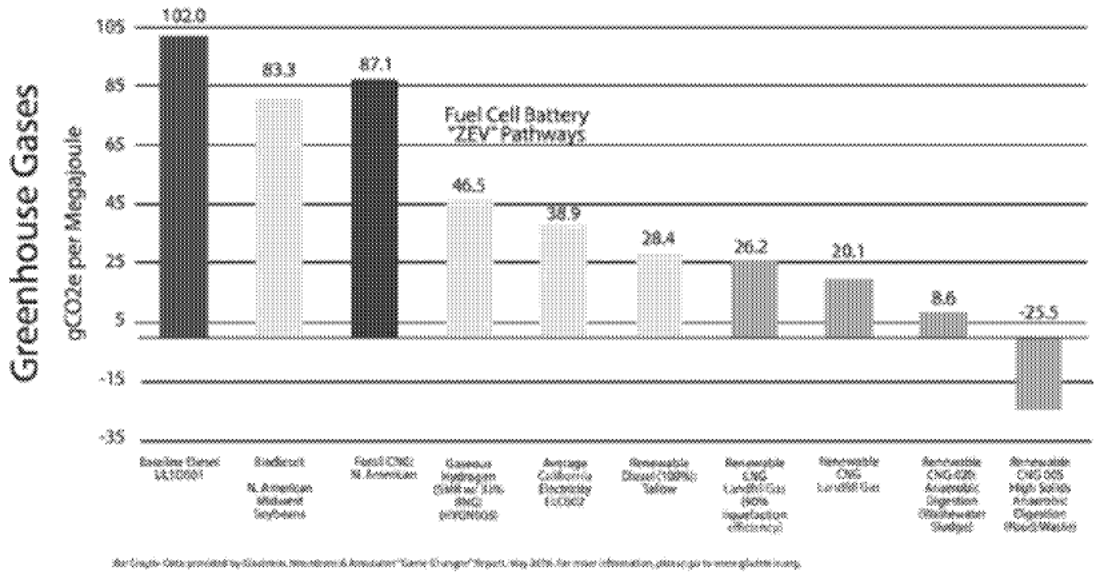
- *The availability and effectiveness of technology, and the appropriate lead time for introduction of technology*
- *Any relevant information in light of newly available information.*
- *The impact of the greenhouse gas emission standards on the Corporate Average Fuel Economy standards and a national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



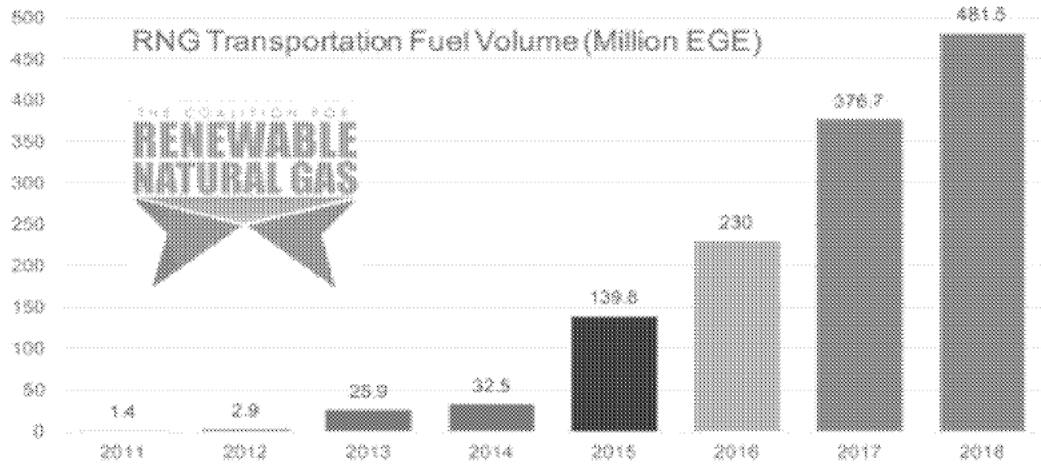
Source: Gladstein, Neandross & Associates[12]

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.

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*

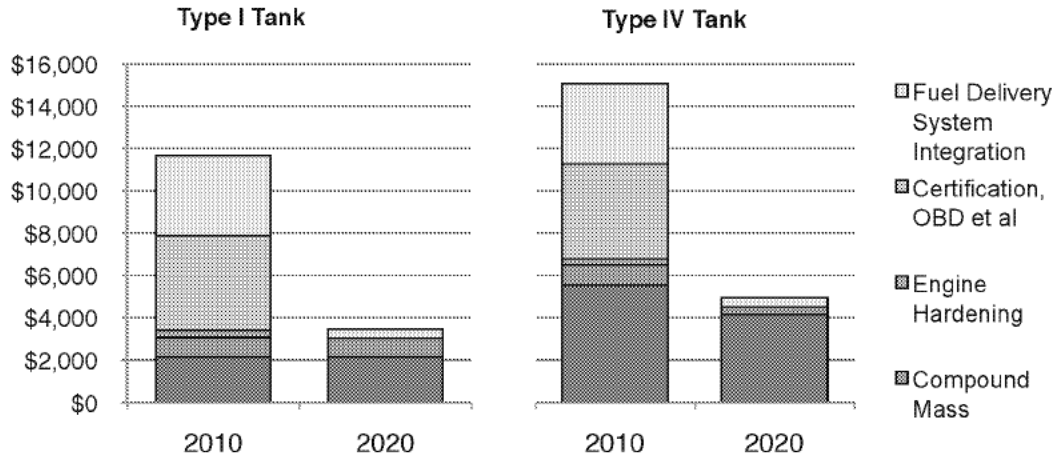
As part of a shift towards a serious analysis of NGVs in the MTE, the agencies must consider not only the current costs of NGVs but their potential for very rapid cost reductions with production at scale. Indeed, while the current incremental prices of CNG pickups are typically $10,000 or more (including 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.*

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/.

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;*

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

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[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

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

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

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

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.

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

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

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.

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,

Robert C. Atkinson
Chief Regulatory Officer
VNG.co LLC
rcatkinson@vng.co
908-447-4201

ED_001220A_00000924-00026

Appointment

From: Lewis, Josh [Lewis.Josh@epa.gov]
Sent: 12/13/2017 12:32:33 PM
To: Cyran, Carissa [Cyran.Carissa@epa.gov]; Loving, Shanita [Loving.Shanita@epa.gov]; Atkinson, Emily [Atkinson.Emily@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 + [redacted]

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
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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.
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Appointment

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/5/2018 2:34:17 PM
To: Lewis, Josh [Lewis.Josh@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Atkinson, Emily [Atkinson.Emily@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 + [redacted]

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 M...

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

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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

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.

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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
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:
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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
Mobile: 202-422-6182
<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

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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
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Voice: 202-564-1850
Email: atkinson.emily@epa.gov

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Sent from my iPhone

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Emily

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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

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Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

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To: Laurie Holmes <lholmes@mema.org>; Catherine Boland <cboland@MEMA.ORG>
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+ 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.

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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>
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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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Assistant Administrator
Office of Air and Radiation

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

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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
Mobile: 202-422-6182
<image001.png>
April 10-11 | Washington, DC
www.mema.org/dcsummit

Message

From: ROBERT.WYMAN@lw.com [ROBERT.WYMAN@lw.com]
Sent: 12/13/2017 1:26:16 AM
To: Lewis, Josh [Lewis.Josh@epa.gov]
CC: Atkinson, Emily [Atkinson.Emily@epa.gov]; Loving, Shanita [Loving.Shanita@epa.gov]
Subject: RE: Confirmed 12/13 at 4pm: Request for Meeting

Thank you!

From: Lewis, Josh [mailto:Lewis.Josh@epa.gov]
Sent: Tuesday, December 12, 2017 4:30 PM
To: Wyman, Robert (LA) <ROBERT.WYMAN@lw.com>
Cc: Atkinson, Emily <Atkinson.Emily@epa.gov>; Loving, Shanita <Loving.Shanita@epa.gov>
Subject: Re: Confirmed 12/13 at 4pm: Request for Meeting

Let's say 930. I don't think we've pre-cleared the names of your attendees with security so please plan for a few extra minutes to get through the door and up to our conference room

On Dec 12, 2017, at 5:25 PM, "ROBERT.WYMAN@lw.com" <ROBERT.WYMAN@lw.com> wrote:

> Thank you, Josh. Just let me know which he prefers (either can work for me). I just need to send an email to the NCAT members tonight to let them know when the meeting starts (9 or 9:30).
>
> -----Original Message-----
> From: Lewis, Josh [mailto:Lewis.Josh@epa.gov]
> Sent: Tuesday, December 12, 2017 2:22 PM
> To: Wyman, Robert (LA) <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: 202 329 2291

-----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.

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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

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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: Lauren Wilk [lwilk@aluminum.org]
Sent: 2/5/2018 7:52:00 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.

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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

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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 [Atkinson.Emily@epa.gov]
Sent: 2/5/2018 7:41:21 PM
To: Lewis, Josh [Lewis.Josh@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Atkinson, Emily [Atkinson.Emily@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

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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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: 2/5/2018 2:33:52 PM
To: Laurie Holmes [lholmes@mema.org]
CC: Lewis, Josh [Lewis.Josh@epa.gov]; Resendez, Mary [Resendez.Mary@epa.gov]
Subject: RE: Auto Suppliers Meeting on the Midterm Evaluation for Vehicle GHG Standards

Hi Laurie,

Yes, below is a call in number and we will open the line for today's 4pm meeting. See the rest of the group later today.

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: Monday, February 05, 2018 9:19 AM
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: Lewis, Josh [Lewis.Josh@epa.gov]
Sent: 12/13/2017 12:30:25 AM
To: Robert.Wyman@LW.com
CC: Atkinson, Emily [Atkinson.Emily@epa.gov]; Loving, Shanita [Loving.Shanita@epa.gov]
Subject: Re: Confirmed 12/13 at 4pm: Request for Meeting

Let's say 930. I don't think we've pre-cleared the names of your attendees with security so please plan for a few extra minutes to get through the door and up to our conference room

On Dec 12, 2017, at 5:25 PM, "ROBERT.WYMAN@lw.com" <ROBERT.WYMAN@lw.com> wrote:

> Thank you, Josh. Just let me know which he prefers (either can work for me). I just need to send an email to the NCAT members tonight to let them know when the meeting starts (9 or 9:30).
>
> -----Original Message-----
> From: Lewis, Josh [mailto:Lewis.Josh@epa.gov]
> Sent: Tuesday, December 12, 2017 2:22 PM
> To: Wyman, Robert (LA) <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: 202 329 2291

-----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.

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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

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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: Laurie Holmes [lholmes@mema.org]
Sent: 1/18/2018 8:08:26 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

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> 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: ROBERT.WYMAN@lw.com [ROBERT.WYMAN@lw.com]
Sent: 12/12/2017 10:46:54 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

Our attendee list for tomorrow morning's meeting:

Bob Wyman Latham & Watkins
Devin O'ConnorLatham & Watkins
Joe MendelsohnTesla
Rohan Patel Tesla
Kathy Robertson Exelon
Amy Pressler Edison International
Bill McGrath Brownstein & Hyatt
Melissa Lavinson PG&E

Very sorry for sending this list so late!

Bob

-----Original Message-----
From: Lewis, Josh [mailto:Lewis.Josh@epa.gov]
Sent: Tuesday, December 12, 2017 2:22 PM
To: Wyman, Robert (LA) <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: 202 329 2291

-----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.

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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

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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 [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.

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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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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.

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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: 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: ROBERT.WYMAN@lw.com [ROBERT.WYMAN@lw.com]
Sent: 12/12/2017 10:24:25 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

Thank you, Josh. Just let me know which he prefers (either can work for me). I just need to send an email to the NCAT members tonight to let them know when the meeting starts (9 or 9:30).

-----Original Message-----
From: Lewis, Josh [mailto:Lewis.Josh@epa.gov]
Sent: Tuesday, December 12, 2017 2:22 PM
To: Wyman, Robert (LA) <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: 202 329 2291

-----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,

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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,

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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]
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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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Message

From: Laurie Holmes [lholmes@mema.org]
Sent: 1/18/2018 5:45:35 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]
Subject: Re: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Emily, thank you. I think this should work but little me check with a few folks - I'm on work travel today - and get back to you very soon.

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: 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.
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>
> 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: Lewis, Josh [Lewis.Josh@epa.gov]
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: 202 329 2291

-----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.

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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
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Latham & Watkins LLP

Appointment

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/5/2018 7:39:08 PM
To: Lewis, Josh [Lewis.Josh@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Atkinson, Emily [Atkinson.Emily@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
Location: WJC-N 5400 + Video with AA

Start: 3/2/2018 8:00:00 PM
End: 3/2/2018 8:45:00 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 --

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: 2/5/2018 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.

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

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 [Atkinson.Emily@epa.gov]
Sent: 1/30/2018 2:20:12 PM
To: Lewis, Josh [Lewis.Josh@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Atkinson, Emily [Atkinson.Emily@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

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

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

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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

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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.

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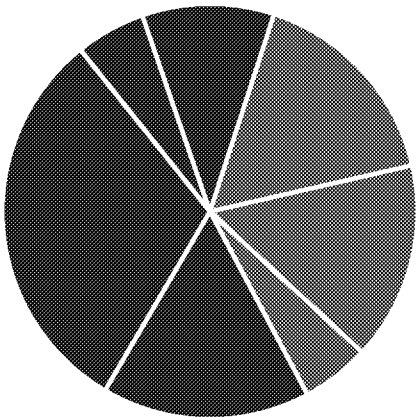
Shift To Light Trucks Eroding Benefits of Rules

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

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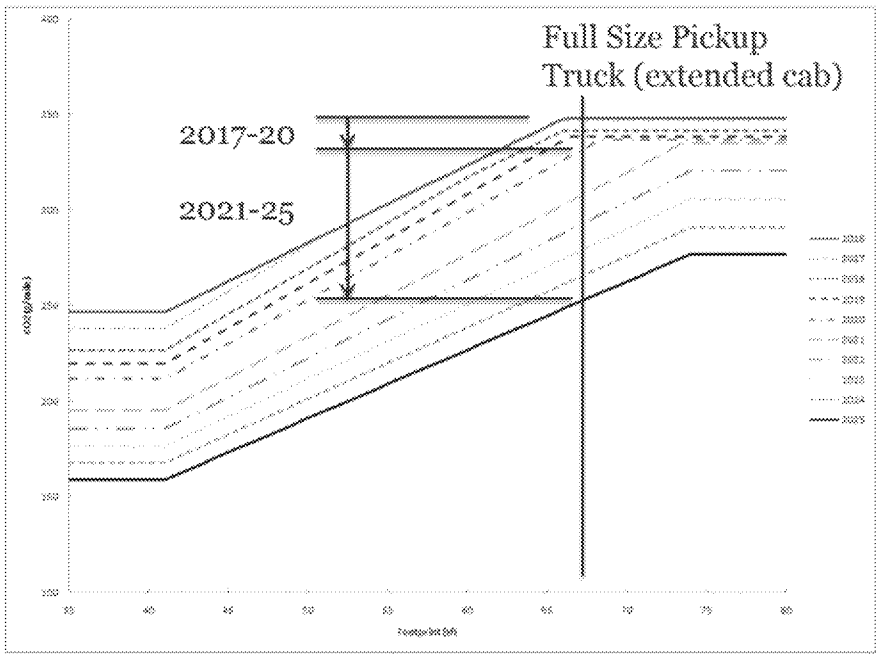
Emission Solutions for Pickups Most Urgently Needed

- 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

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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.

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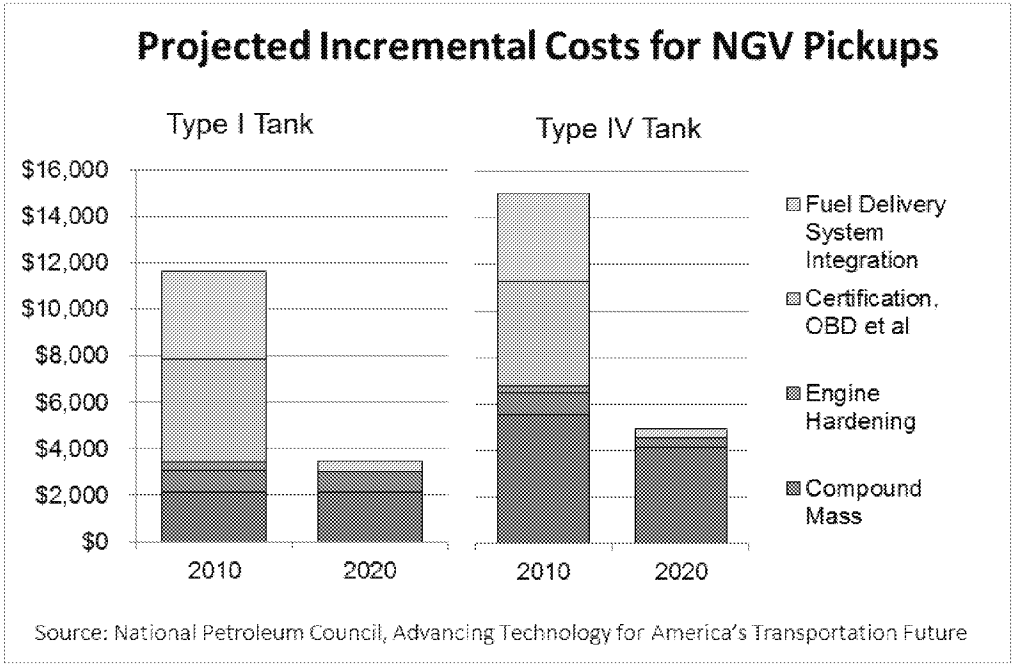
Major NGV Cost Reductions With Scale

- 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



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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

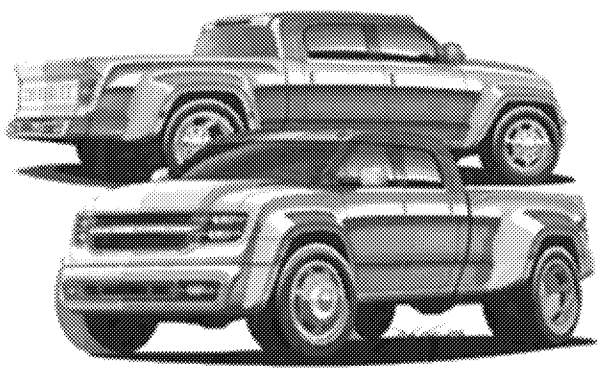
Advanced powertrains that fully exploit ultra high-octane low-carbon fuel properties of methane

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"



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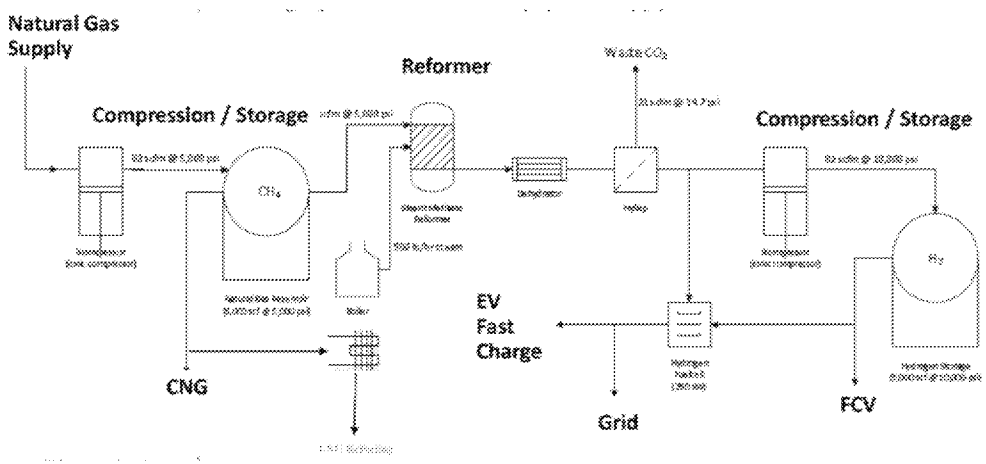
NGV Synergies With Hydrogen

- 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



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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.

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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.

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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

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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

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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

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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.

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

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.
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.
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

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

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

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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

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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.

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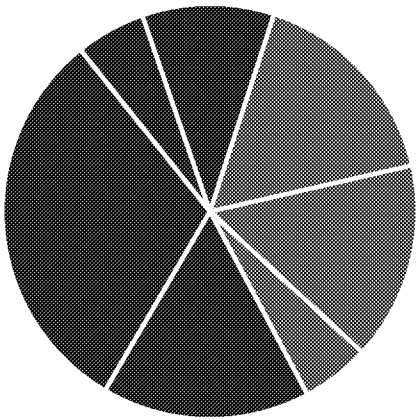
Shift To Light Trucks Eroding Benefits of Rules

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

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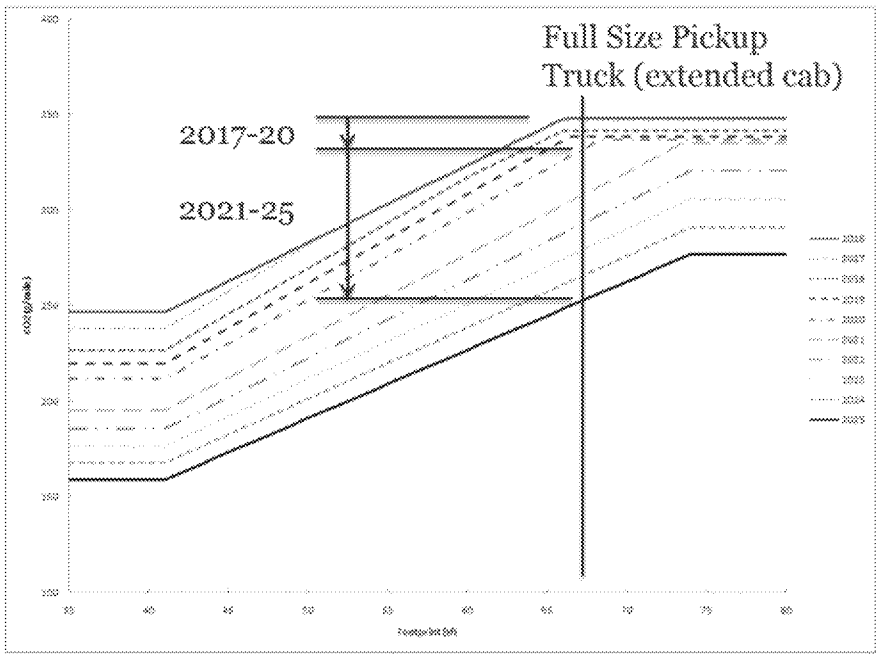
Emission Solutions for Pickups Most Urgently Needed

- 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

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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.

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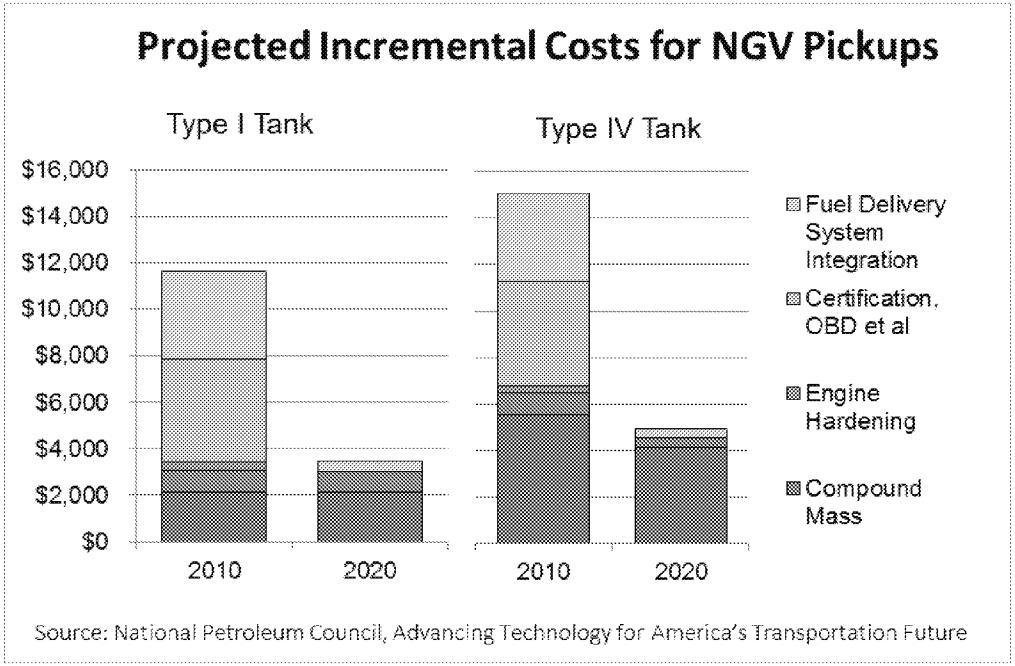
Major NGV Cost Reductions With Scale

- 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



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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

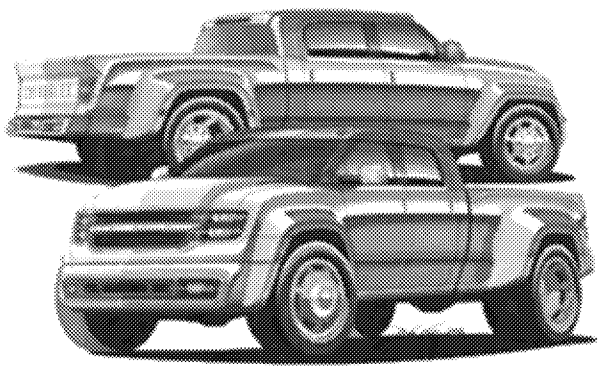
Advanced powertrains that fully exploit ultra high-octane low-carbon fuel properties of methane

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"



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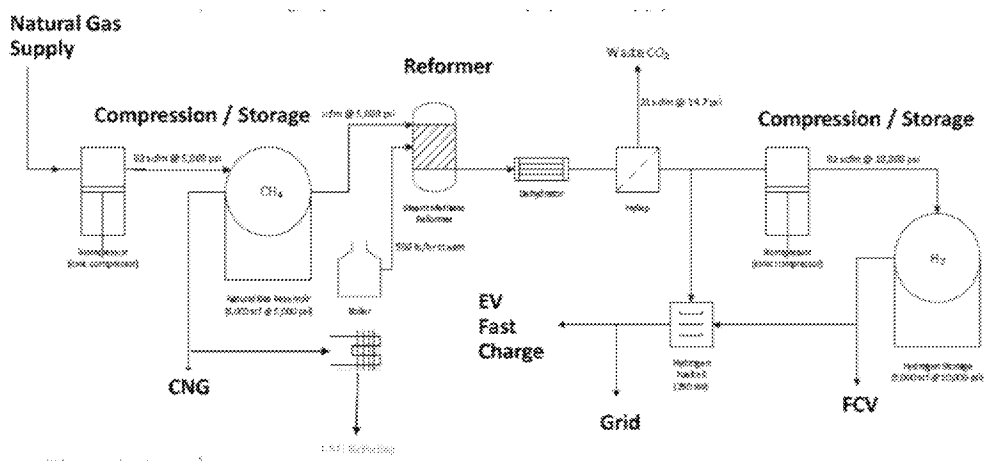
NGV Synergies With Hydrogen

- 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**



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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.

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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.

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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

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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

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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

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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

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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.

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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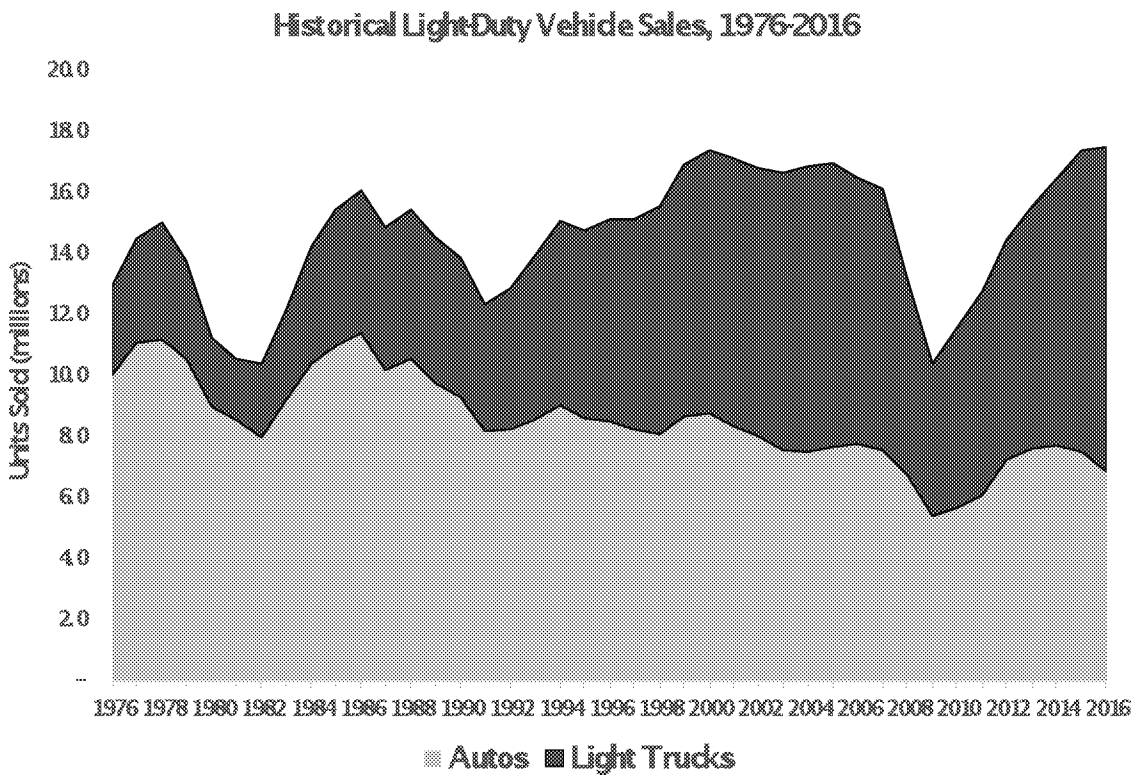
The Need for Light Truck Alternatives in a Changing Market Context

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

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.

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.

- 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:

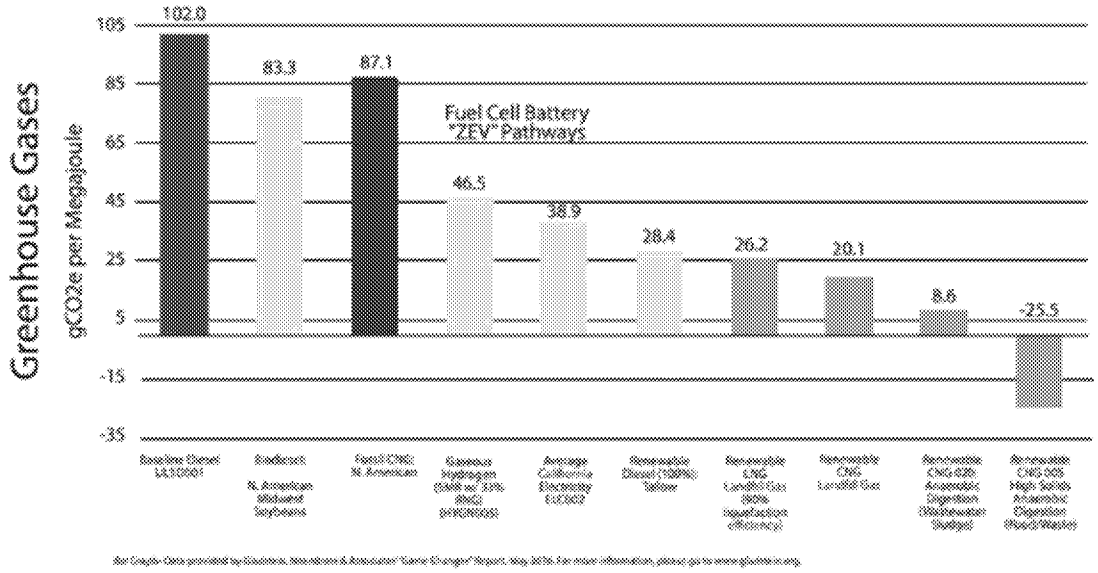
- *The availability and effectiveness of technology, and the appropriate lead time for introduction of technology*
- *Any relevant information in light of newly available information.*
- *The impact of the greenhouse gas emission standards on the Corporate Average Fuel Economy standards and a national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



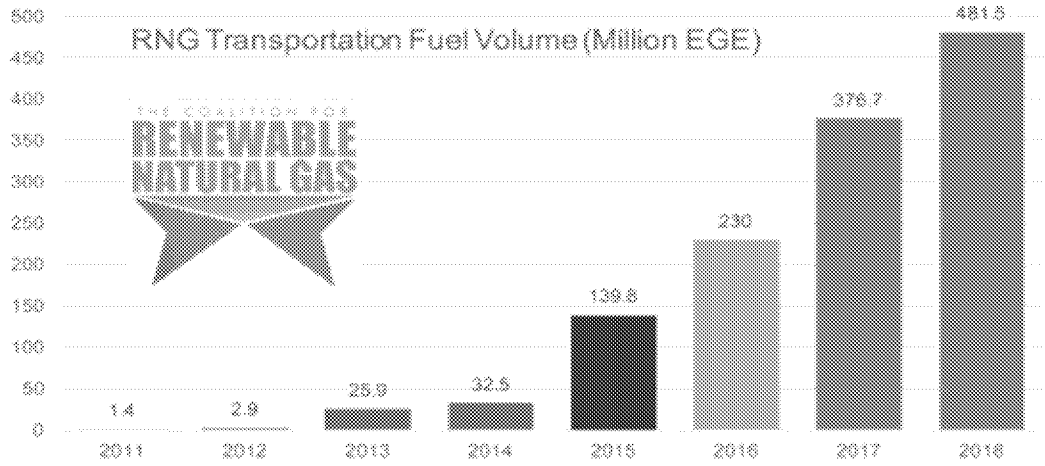
Source: Gladstein, Neandross & Associates[12]

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.

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*

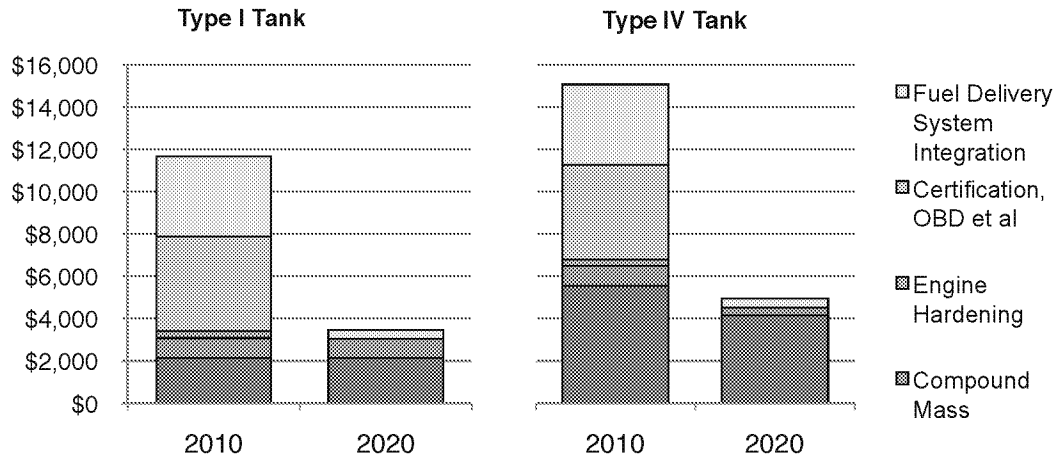
As part of a shift towards a serious analysis of NGVs in the MTE, the agencies must consider not only the current costs of NGVs but their potential for very rapid cost reductions with production at scale. Indeed, while the current incremental prices of CNG pickups are typically $10,000 or more (including 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.*

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.

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/.

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;*

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

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[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

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

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

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

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.

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

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

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.

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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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.

- **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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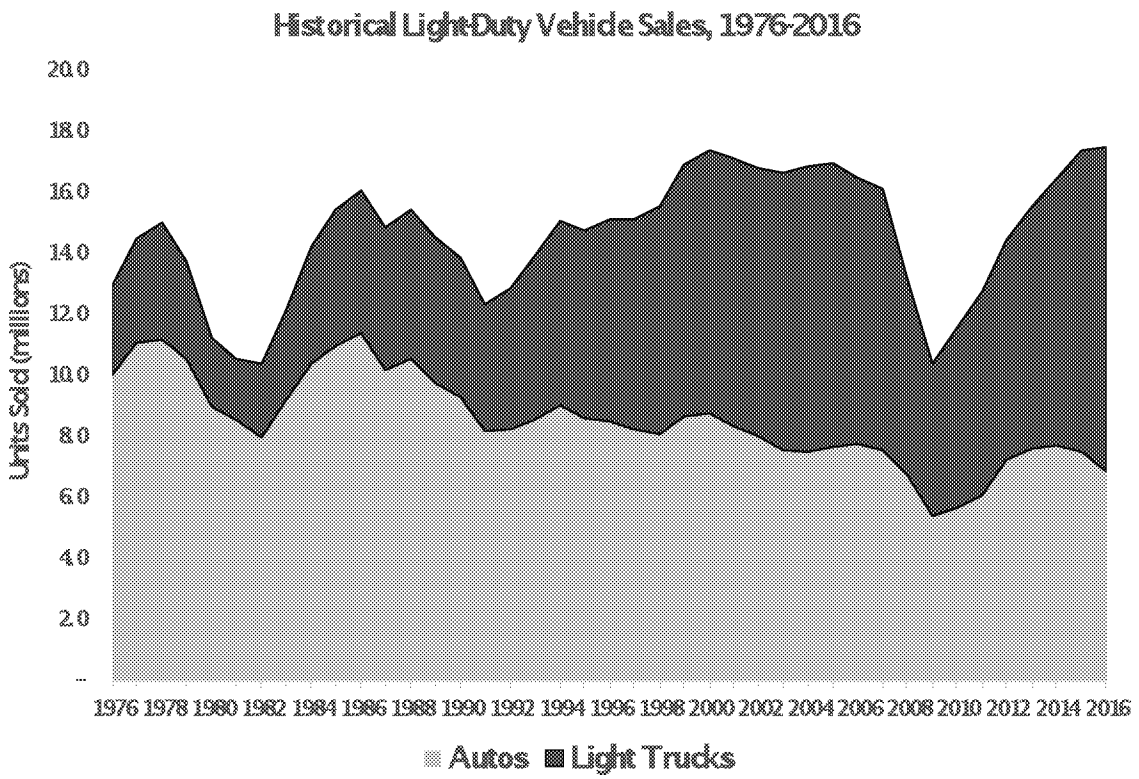
The Need for Light Truck Alternatives in a Changing Market Context

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

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.

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.

- 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:

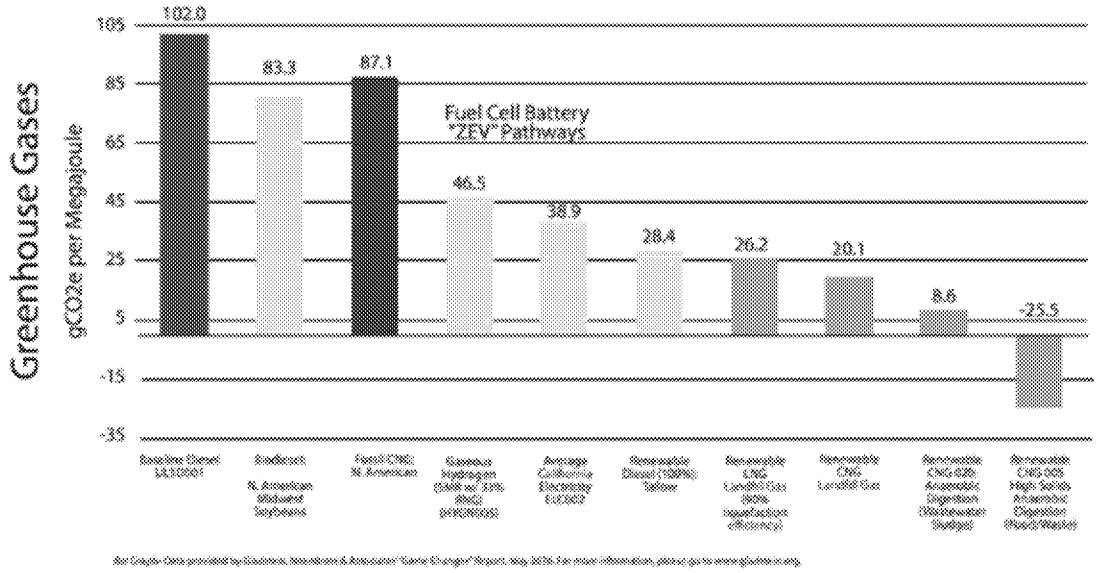
- *The availability and effectiveness of technology, and the appropriate lead time for introduction of technology*
- *Any relevant information in light of newly available information.*
- *The impact of the greenhouse gas emission standards on the Corporate Average Fuel Economy standards and a national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



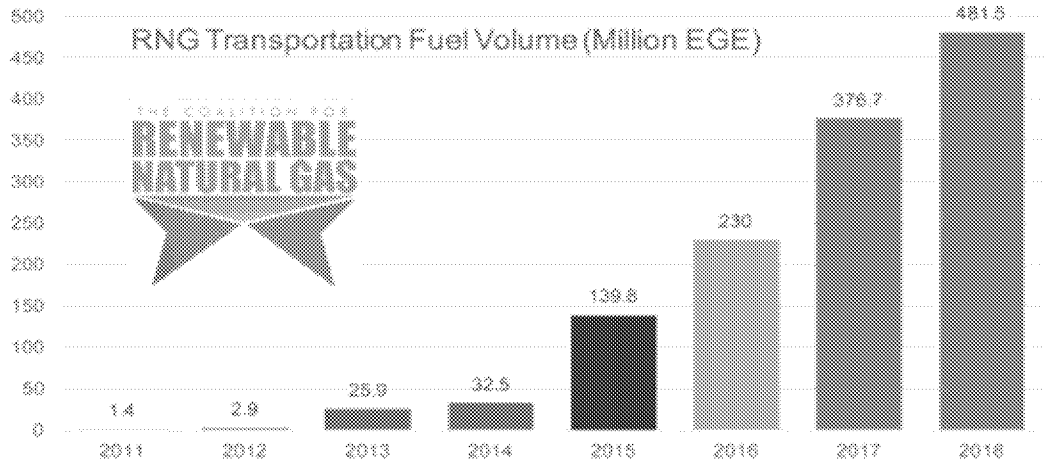
Source: Gladstein, Neandross & Associates[12]

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.

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.

- 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*

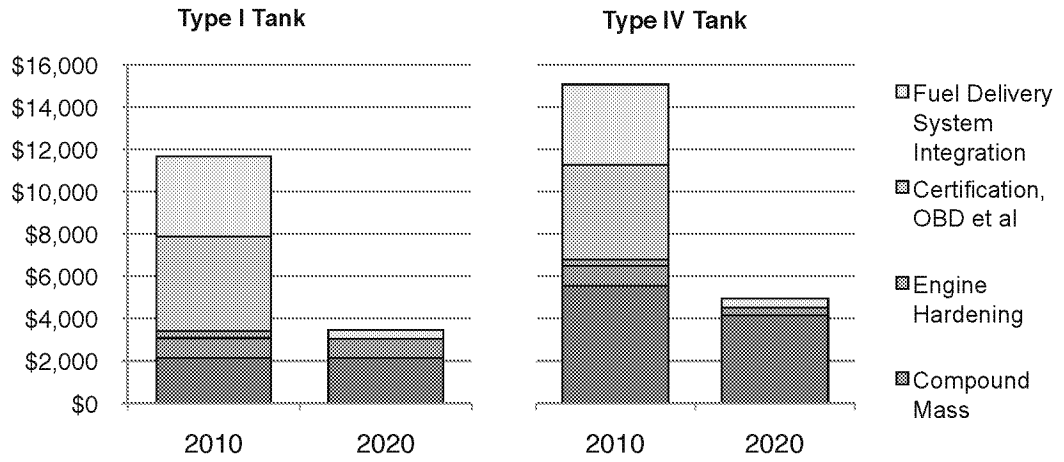
As part of a shift towards a serious analysis of NGVs in the MTE, the agencies must consider not only the current costs of NGVs but their potential for very rapid cost reductions with production at scale. Indeed, while the current incremental prices of CNG pickups are typically $10,000 or more (including 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.*

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.

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/.

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;*

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

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[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

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

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

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

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.

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

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

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.

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

ED_001220A_00001153-00026

Message

From: ROBERT.WYMAN@lw.com [ROBERT.WYMAN@lw.com]
Sent: 12/12/2017 10:09:45 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: 202 329 2291

-----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.

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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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Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 1/18/2018 4:08:41 PM
To: Laurie Holmes [lholmes@mema.org]
CC: Lewis, Josh [Lewis.Josh@epa.gov]
Subject: RE: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

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: ROBERT.WYMAN@lw.com [ROBERT.WYMAN@lw.com]
Sent: 12/12/2017 10:03:59 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

Yes, I can do that. I will reach out to our NCAT members and get as many of them there as possible. But, yes.

-----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: 202 329 2291

-----Original Message-----
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To: Robert.Wyman@LW.com
Cc: Loving, Shanita <Loving.Shanita@epa.gov>
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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

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Thank you.
Emily

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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

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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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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.

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

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:

Message

From: Lewis, Josh [Lewis.Josh@epa.gov]
Sent: 12/12/2017 9:49:25 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]; 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: 202 329 2291

-----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

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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

Message

From: Tucker, Jamie [jtucker@AKINGUMP.COM]
Sent: 1/9/2018 8:02:17 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 [Atkinson.Emily@epa.gov]
Sent: 12/12/2017 5:45:50 PM
To: Cyran, Carissa [Cyran.Carissa@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]; Loving, Shanita [Loving.Shanita@epa.gov]; Atkinson, Emily [Atkinson.Emily@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 + [redacted]

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, 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.

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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

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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

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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>

355 South Grand Avenue
Los Angeles, CA 90071-1560
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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)***.

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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

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Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 1/9/2018 3:53:08 PM
To: jtucker@AKINGUMP.COM
CC: Feeley, Drew (Robert) [Feeley.Drew@epa.gov]; Lewis, Josh [Lewis.Josh@epa.gov]
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.

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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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Message

From: Matt Meenan [mmeenan@aluminum.org]
Sent: 2/28/2018 3:21:40 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]; Lauren Wilk [lwilk@aluminum.org]
Subject: RE: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request

Thanks, Emily. One small change from the list below. Swapping out a name.

Also my cell is [redacted] should you need it.

Thanks,
Matt

- Henry Gordinier, Tri-Arrows
- Ganesh Panneer, Novelis
- Ed Olivares, Constellium (consultant)
- Dan Minwell, Constellium
- Mario Greco, Arconic
- Mike Belwood, Arconic
- Joe Quinn, Aluminum Association
- Matt Meenan, Aluminum Association
- John Fitzpatrick, Stratacomm

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, February 28, 2018 10:18 AM
To: Lauren Wilk <lwilk@aluminum.org>
Cc: Matt Meenan <mmeenan@aluminum.org>
Subject: RE: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request

Thank you Lauren!

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 28, 2018 10:13 AM
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 | 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

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 | 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:

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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>
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Subject: RE: Aluminum Association Meeting Request

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JOIN THE CONVERSATION:

Appointment

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/28/2018 3:17:59 PM
To: Lewis, Josh [Lewis.Josh@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Atkinson, Emily [Atkinson.Emily@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 --

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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,
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Voice: 202-564-1850
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From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Wednesday, February 07, 2018 2:59 PM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>
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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

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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
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Much appreciated!

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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.

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:

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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
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Voice: 202-564-1850
Email: atkinson.emily@epa.gov

From: Lauren Wilk [mailto:lwilk@aluminum.org]
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To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Aluminum Association Meeting Request

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

Much appreciated!

Lauren

The Aluminum Association

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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,

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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 –

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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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: Lee Janger [lee@armitagellc.com]
Sent: 2/2/2018 7:19:00 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: 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 | 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

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
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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
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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

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To: Atkinson, Emily <Atkinson.Emily@epa.gov>
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Room 5412B, 1200 Pennsylvania Avenue NW
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Voice: 202-564-1850
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To: Atkinson, Emily <Atkinson.Emily@epa.gov>
Subject: RE: Aluminum Association Meeting Request

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Vice President, Policy & International Trade
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T 703.358.2981 | C 913.244.2796| F 703.358.2961
JOIN THE CONVERSATION:

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JOIN THE CONVERSATION:

Message

From: Laurie Holmes [lholmes@mema.org]
Sent: 1/12/2018 7:19:40 PM
To: Lewis, Josh [Lewis.Josh@epa.gov]; Catherine Boland [cboland@MEMA.ORG]
CC: Atkinson, Emily [Atkinson.Emily@epa.gov]
Subject: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Josh,
The entire week of January 29 would work well.

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: Lewis, Josh [Lewis.Josh@epa.gov]
Sent: 1/12/2018 7:15:54 PM
To: lholmes@mema.org; cboland@MEMA.ORG
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Subject: FW: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

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Chief of Staff
EPA/Office of Air and Radiation
Office: 202 564 2095
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Cc: Catherine Boland <cboland@MEMA.ORG>; Lewis, Josh <Lewis.Josh@epa.gov>
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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: Lee Janger [lee@armitagellc.com]
Sent: 2/5/2018 5:57:35 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.

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Thank you again for your time and help.
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Lee@ArmitageLLC.com

>www.VehicleEfficiency.com<

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Message

From: Lauren Wilk [lwilk@aluminum.org]
Sent: 2/5/2018 5:56:11 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:

Message

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/5/2018 5:53:20 PM
To: 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: Laurie Holmes [lholmes@mema.org]
Sent: 1/19/2018 4:09:15 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]
Subject: RE: Confirmed 2/5 at 4:15pm: Auto Suppliers Meeting Request on the Midterm Evaluation for Vehicle GHG Standards

Emily, thank you. I will plan to send you a list of attendees the week prior.

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: 2/5/2018 5:48:26 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

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 [Atkinson.Emily@epa.gov]
Sent: 2/5/2018 5:47:39 PM
To: Lewis, Josh [Lewis.Josh@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Atkinson, Emily [Atkinson.Emily@epa.gov]

Subject: HOLD || Meet with Aluminum Association - Aluminum Transport Group Members (Tentative)
Attachments: Aluminum Association Meeting Request
Location: WJC-N 5400 + Video with AA

Start: 3/2/2018 8:00:00 PM
End: 3/2/2018 8:45:00 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

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).

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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 | **C** 913.244.2796 | **F** 703.358.2961
JOIN THE CONVERSATION:

Message

From: Tucker, Jamie [jtucker@AKINGUMP.COM]
Sent: 1/3/2018 8:20:35 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
Attachments: Updated VNG Comments on EPA-HQ-OAR-2015-0827.pdf; NGV Executive Action Summary.docx

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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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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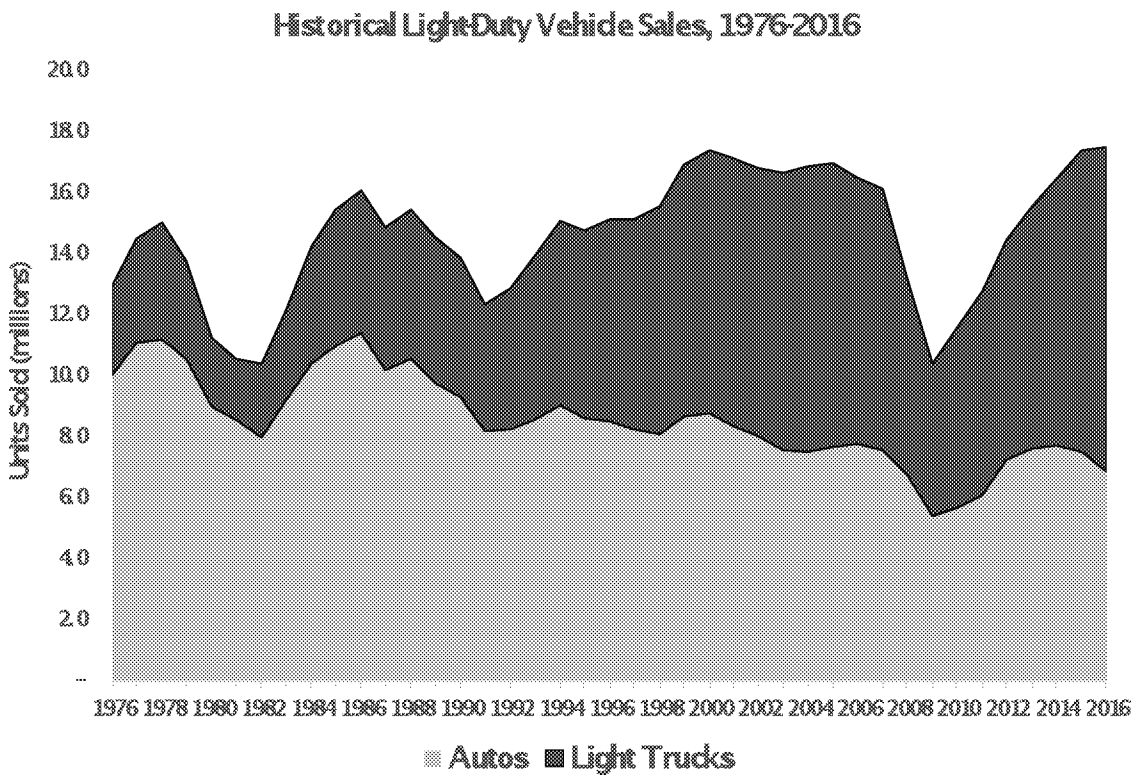
The Need for Light Truck Alternatives in a Changing Market Context

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

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.

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.

- 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:

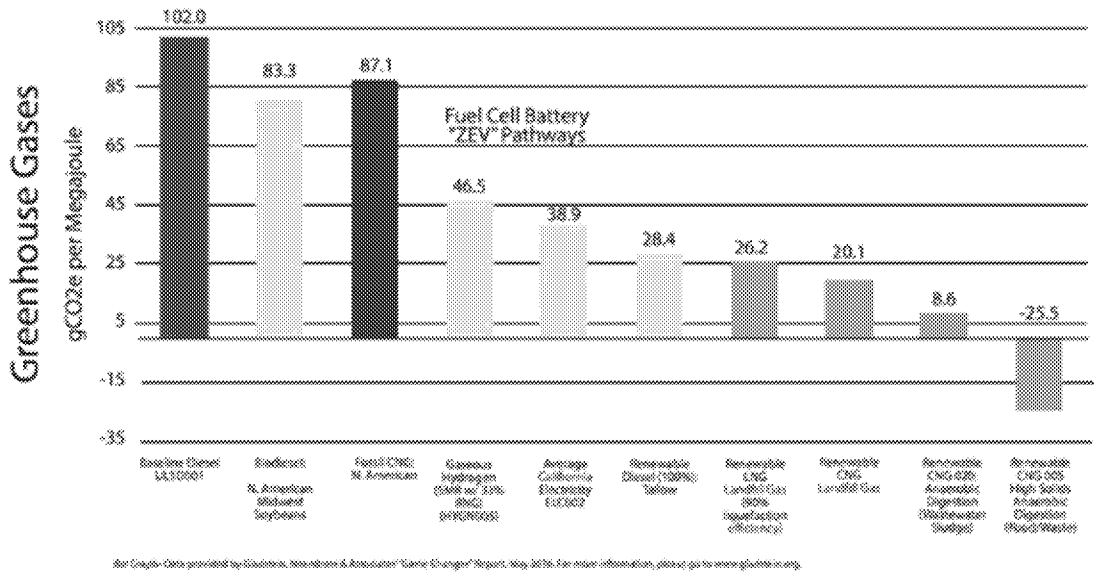
- *The availability and effectiveness of technology, and the appropriate lead time for introduction of technology*
- *Any relevant information in light of newly available information.*
- *The impact of the greenhouse gas emission standards on the Corporate Average Fuel Economy standards and a national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



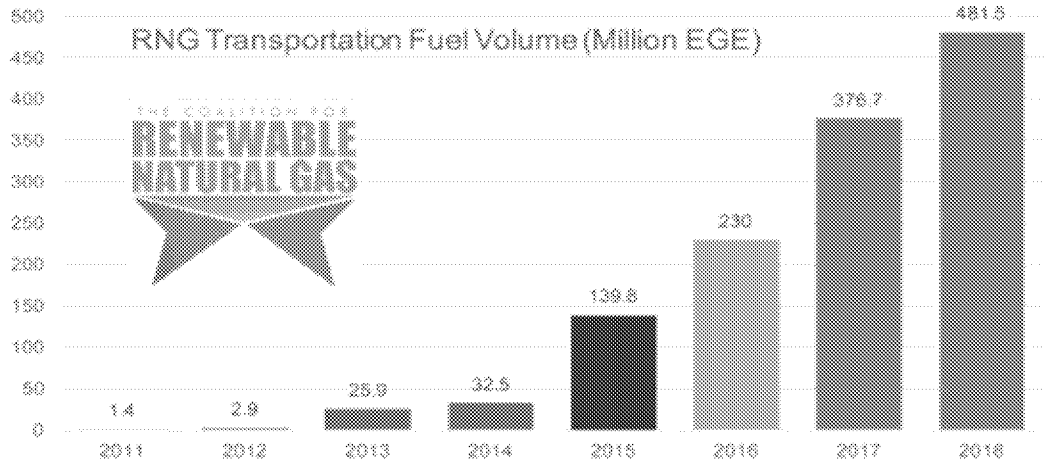
Source: Gladstein, Neandross & Associates[12]

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.

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.

- 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*

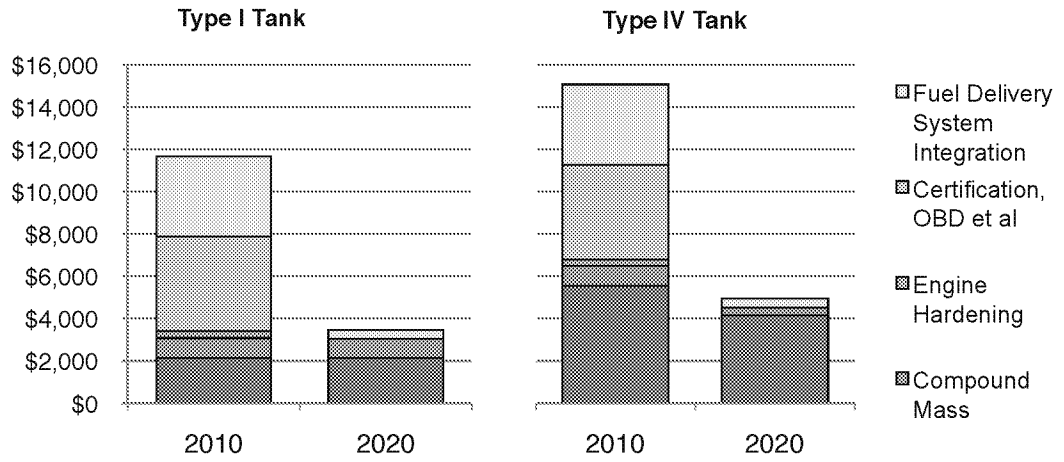
As part of a shift towards a serious analysis of NGVs in the MTE, the agencies must consider not only the current costs of NGVs but their potential for very rapid cost reductions with production at scale. Indeed, while the current incremental prices of CNG pickups are typically $10,000 or more (including 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.*

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.

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/.

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;*

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

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[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

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

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

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

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.

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

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

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.

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
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ED_001220A_00001755-00026

Appointment

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 11/22/2017 1:51:40 PM
To: Cyran, Carissa [Cyran.Carissa@epa.gov]; Loving, Shanita [Loving.Shanita@epa.gov]; Atkinson, Emily [Atkinson.Emily@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 AA +[redacted]

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: 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
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JOIN THE CONVERSATION:

Appointment

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 11/22/2017 1:51:40 PM
To: Dominguez, Alexander [dominguez.alexander@epa.gov]; Loving, Shanita [Loving.Shanita@epa.gov]; Cyran, Carissa [Cyran.Carissa@epa.gov]; Atkinson, Emily [Atkinson.Emily@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 [redacted]

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

Appointment

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/7/2018 8:02:39 PM
To: Lewis, Josh [Lewis.Josh@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Atkinson, Emily [Atkinson.Emily@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: 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

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

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 [Atkinson.Emily@epa.gov]
Sent: 2/1/2018 2:41:11 PM
To: Lewis, Josh [Lewis.Josh@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Atkinson, Emily [Atkinson.Emily@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: 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: 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: ROBERT.WYMAN@lw.com [ROBERT.WYMAN@lw.com]
Sent: 11/21/2017 9:56:34 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

Message

From: Lauren Wilk [lwilk@aluminum.org]
Sent: 2/7/2018 7:59:21 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
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T 703.358.2981 | C 913.244.2796| F 703.358.2961
JOIN THE CONVERSATION:

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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

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Management Analyst/Office Manager
Immediate Office of the Assistant Administrator
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Email: atkinson.emily@epa.gov

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Subject: RE: Confirmed 3/2 at 3pm: Aluminum Association Meeting Request

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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

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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

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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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Subject: RE: Aluminum Association Meeting Request

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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 | C 913.244.2796| F 703.358.2961
JOIN THE CONVERSATION:

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

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Thanks so much,

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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: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 11/21/2017 9:48:14 PM
To: Robert.Wyman@LW.com
CC: Loving, Shanita [Loving.Shanita@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 [Atkinson.Emily@epa.gov]
Sent: 2/7/2018 5:32:59 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

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Lauren Wilk
Vice President, Policy & International Trade
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JOIN THE CONVERSATION:

Appointment

From: Atkinson, Emily [Atkinson.Emily@epa.gov]
Sent: 2/7/2018 5:32:19 PM
To: Lewis, Josh [Lewis.Josh@epa.gov]; Dominguez, Alexander [dominguez.alexander@epa.gov]; Atkinson, Emily [Atkinson.Emily@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: 2/7/2018 4:01:25 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]
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JOIN THE CONVERSATION:

Message

From: Lauren Wilk [lwilk@aluminum.org]
Sent: 3/9/2018 8:06:12 PM
To: Atkinson, Emily [Atkinson.Emily@epa.gov]
Subject: RE: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request

Hi, Emily. Our meeting leader (Ganesh) would like to send a follow-up email to Mr. Wehrum with some additional materials. What is the best email address for him?

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 | C 913.244.2796| F 703.358.2961
JOIN THE CONVERSATION:

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, February 28, 2018 10:43 AM
To: Matt Meenan <mmeenan@aluminum.org>; Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request

Thank you Matt.

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: Matt Meenan [mailto:mmeenan@aluminum.org]
Sent: Wednesday, February 28, 2018 10:22 AM
To: Atkinson, Emily <Atkinson.Emily@epa.gov>; Lauren Wilk <lwilk@aluminum.org>
Subject: RE: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request

Thanks, Emily. One small change from the list below. Swapping out a name.

Also my cell is [redacted] should you need it.

Thanks,
Matt

- Henry Gordinier, Tri-Arrows
- Ganesh Panneer, Novelis
- Ed Olivares, Constellium (consultant)
- Dan Minwell, Constellium
- Mario Greco, Arconic
- Mike Belwood, Arconic
- Joe Quinn, Aluminum Association
- Matt Meenan, Aluminum Association
- John Fitzpatrick, Stratacomm

From: Atkinson, Emily [mailto:Atkinson.Emily@epa.gov]
Sent: Wednesday, February 28, 2018 10:18 AM
To: Lauren Wilk <lwilk@aluminum.org>
Cc: Matt Meenan <mmeenan@aluminum.org>
Subject: RE: Confirmed 3/1 at 4pm: Aluminum Association Meeting Request

Thank you Lauren!

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From: Lauren Wilk [mailto:lwilk@aluminum.org]
Sent: Wednesday, February 28, 2018 10:13 AM
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
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Much appreciated!

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You are confirmed for 45 minute meeting on Thursday, March 1, 2018 at 4:00pm with Bill Wehrum.
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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 | 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.

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

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: Lewis, Josh [Lewis.Josh@epa.gov]
Sent: 1/5/2018 8:53:47 PM
To: Tucker, Jamie [jtucker@AKINGUMP.COM]; Atkinson, Emily [Atkinson.Emily@epa.gov]
CC: Feeley, Drew (Robert) [Feeley.Drew@epa.gov]
Subject: RE: Meeting Request re: Natural Gas Vehicles

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: 202 329 2291

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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Message

From: ROBERT.WYMAN@lw.com [ROBERT.WYMAN@lw.com]
Sent: 11/17/2017 11:02:54 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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Message

From: David Schwietert [DSchwietert@autoalliance.org]
Sent: 5/26/2017 10:37:59 PM
To: Bolen, Brittany [bolen.brittany@epa.gov]
Subject: Fwd: Alert: California Warns Senate Taking Step to Gut Auto Efficiency Rules

Begin forwarded message:

From: Bloomberg Government <alerts@bgov.com>
Date: May 26, 2017 at 6:18:28 PM EDT
To: <dschwietert@AUTOALLIANCE.ORG>
Subject: Alert: California Warns Senate Taking Step to Gut Auto Efficiency Rules

California Warns Senate Taking Step to Gut Auto Efficiency Rules

By John Lippert and Ryan Beene | May 26, 2017 06:18PM ET | Bloomberg Government

California Governor Jerry Brown criticized a U.S. Senate bill that aims to simplify auto efficiency standards, warning the measure represents a step toward decimating requirements that manufacturers produce cleaner cars.

Legislation introduced Thursday by Missouri Republican Roy Blunt would align the differing approaches that separate U.S. agencies take to regulating fuel mileage and carbon emissions. Sponsors include Michigan Democrat Debbie Stabenow.

California countered America's worst smog by writing its own clean-air rules starting in 1970 and has vowed to remain a bulwark against the deregulation President Donald Trump has promised the auto industry. Brown, a Democrat, said in an interview Friday that the Senate bill bolsters carmakers' efforts to avoid billions of dollars in penalties for failing to reach efficiency goals.

"It's of the nature of salami tactics," Brown said by phone. "They'll try to take a slice, and if they get away with it, they'll take another slice and another slice until they really gut the current regime to reduce greenhouse gases and improve fuel efficiency."

Read more: QuickTake Q&A on California's clean-car resistance to Trump

The National Highway Traffic Safety Administration regulates fuel economy of U.S. cars and trucks as a matter of energy independence. The Environmental Protection Agency, meanwhile, oversees the carbon emissions of vehicles to curb the effects of man-made climate change.

The agencies are reexamining their rules as part of a midterm review of standards set by former President Barack Obama that aim to boost the average fuel economy of each automaker's fleet to about 50.8 miles per gallon by 2025, up from 30.3 mpg this year. Trump reinstated the review in March, nullifying an EPA determination during the final days of the Obama administration that the requirements were feasible.

One Standard

Dissonance between the overlapping rules could result in heavy fines from NHTSA even if companies comply with the EPA's standards, the Alliance of Automobile Manufacturers said Thursday in a statement. Consumers ultimately wind up paying for the overlap through higher sticker prices, according to the alliance, whose members include General Motors Co., Toyota Motor Corp. and Volkswagen AG.

"This bill gets us closer to one national fuel economy standard program that meets the goals of both the NHTSA and EPA programs in a less costly, more efficient way," Blunt said Thursday in a statement on his website.

The Senate bill would enable automakers to earn more credits for introducing aerodynamic designs that reduce fuel consumption, or new technologies like air conditioners that release fewer or safer chemicals into the atmosphere. Carmakers also would have more time to accumulate such credits and apply them against emissions or fuel requirements for vehicles they're delivering to consumers.

Brown said he'll accept an invitation from EPA Administrator Scott Pruitt to discuss future fuel economy and emissions rules. He said he plans to tell Pruitt that climate change is an existential threat causing rising sea levels and forest fires.

"This measure of so-called harmonization is, more than anything else, perfume to cover the odorous maneuver on which they've now embarked," Brown said.

To contact the reporters on this story:
John Lippert in Chicago at jlippert@bloomberg.net;
Ryan Beene in Washington at rbeene@bloomberg.net

To contact the editors responsible for this story:
Craig Trudell at ctrudell1@bloomberg.net;
Jon Morgan at jmorgan97@bloomberg.net
Anne Riley Moffat

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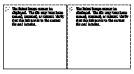


Message

From: David Schwietert [DSchwietert@autoalliance.org]
Sent: 5/3/2017 12:58:32 PM
To: Bolen, Brittany [bolen.brittany@epa.gov]
Subject: FW: re: Auto Alliance follow up - Administrator Pruitt Meeting
Attachments: AdministratorPruittDeck April 27 2017.pptx

From: David Schwietert
Sent: Thursday, April 27, 2017 5:50 PM
To: bollen.brittany@epa.gov; 'dravis.samantha@epa.gov' <dravis.samantha@epa.gov>
Cc: Jennifer Thomas <JThomas@autoalliance.org>; Chris Nevers <CNevers@autoalliance.org>
Subject: RE: re: Auto Alliance follow up - Administrator Pruitt Meeting

And the related charts/slides that were too large to send in one email

Dave

From: David Schwietert
Sent: Thursday, April 27, 2017 5:49 PM
To: bollen.brittany@epa.gov; 'dravis.samantha@epw.gov' <dravis.samantha@epw.gov>
Cc: Jennifer Thomas <JThomas@autoalliance.org>; Chris Nevers <CNevers@autoalliance.org>
Subject: re: Auto Alliance follow up - Administrator Pruitt Meeting

Brittany and Samantha,

We wanted to pass along an electronic copy of the charts and letter that were raised during today's meeting with Administrator Pruitt.

Please let us know if you have any questions – both regarding the Harmonization Petition that was filed jointly with EPA and DOT last June as well as the Mid Term Review for MY 2022-2025 fuel efficiency standards for light-duty vehicles.

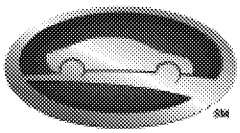
Note, when the Harmonization petition was filed last June, we requested a direct fine rule to resolve various issues in hopes of addressing those items ahead of the Draft Technical Assessment Report (TAR) that kicked off the Mid Term Review.
Soon after our petition was filed, EPA/DOT and CARB released their Draft TAR which now means that the issues outlined in the Harmonization petition would more effectively be addressed via a rulemaking process – or handled administratively via interpretations. Additionally, since late 2015 the Alliance has been seeking various Harmonization changes via legislation because certain changes require statutory modification.

It's also important to keep in mind that the Harmonization issues relate to near term compliance (prior to MY 2022) due to increasing disparity between CAFE and EPA credit and compliance requirements. Effectively, the concept of One National Program hasn't been realized and it can create instances in which an auto manufacturer can be in compliance with more stringent EPA requirements and still be forced to pay CAFE penalties. We have a host of other examples that we'd be happy to walk you through to underscore the changes that need to be made in keeping with the original 2010 and 2012 agreements that were advertised as "One National Program" for compliance purposes.

Thanks,

Dave

David Schwietert
Executive Vice President, Federal Government Relations & Public Policy
P: 202-326-5521 | dschwietert@autoalliance.org



AUTO ALLIANCE
DRIVING INNOVATION℠

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/

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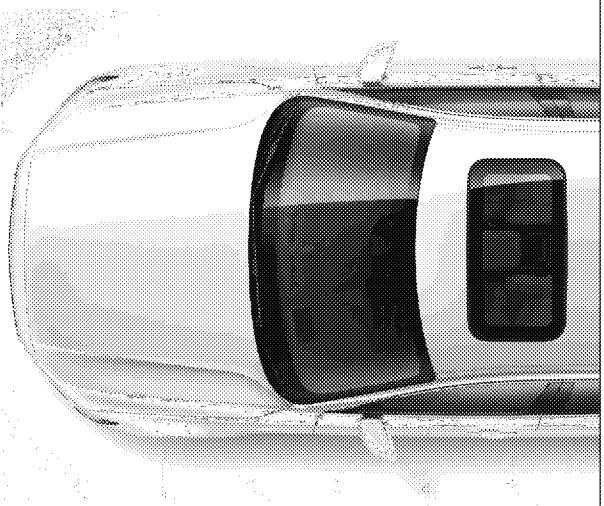
Alliance Board

April 27, 2017



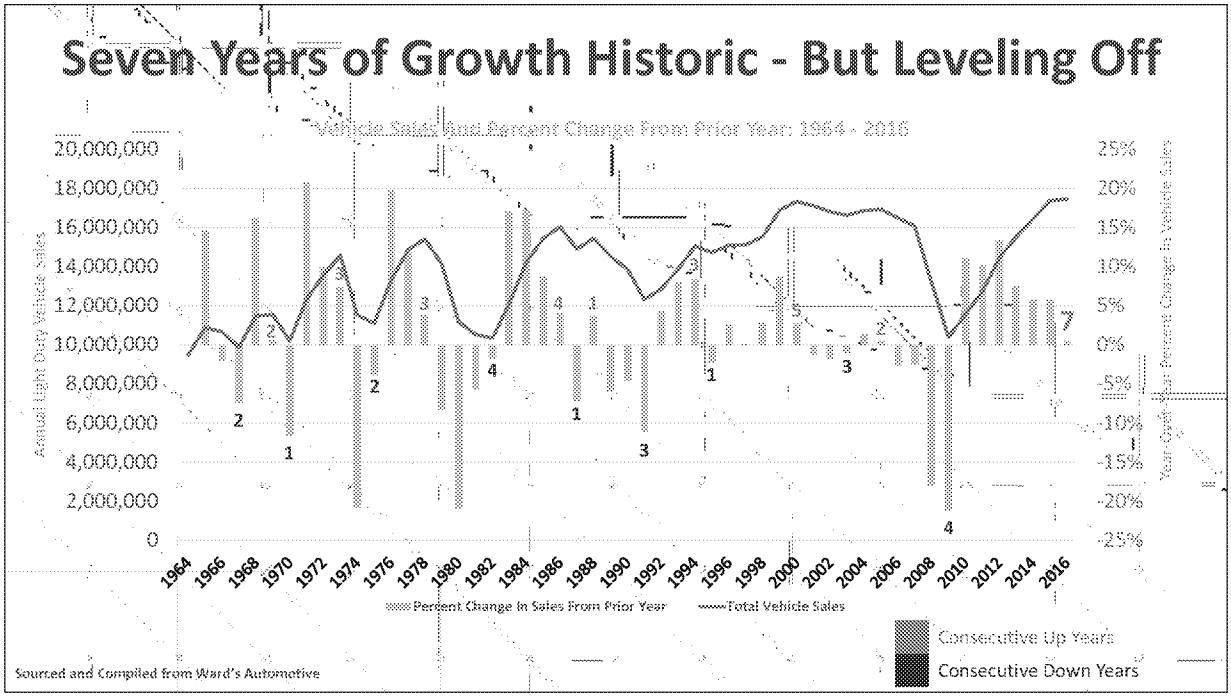
AUTO ALLIANCE

DRIVING INNOVATION

Meeting with EPA Administrator Scott Pruitt

AGENDA

1. Welcome	Administrator Pruitt
2. Introduction	Dietmar Exler
3. Situation Review	Mitch Bainwol
4. GHG / Harmonization	Ludwig Willisch / Dan Turton
5. ZEV	Bob Carter


Seven Years of Growth Historic - But Leveling Off
Vehicle Sales and Percent Change From Prior Year: 1964 - 2016
Annual Light Duty Vehicle Sales
Year Over Year Percent Change in Vehicle Sales
20,000,000
18,000,000
16,000,000
14,000,000
12,000,000
10,000,000
8,000,000
6,000,000
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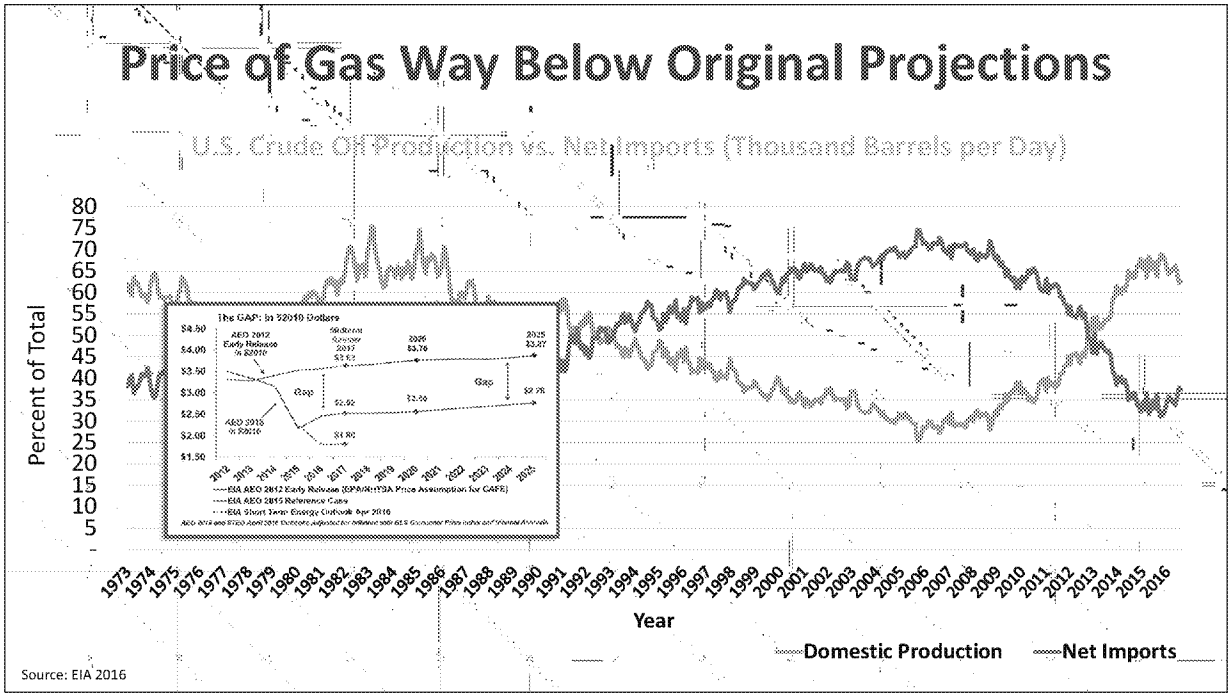
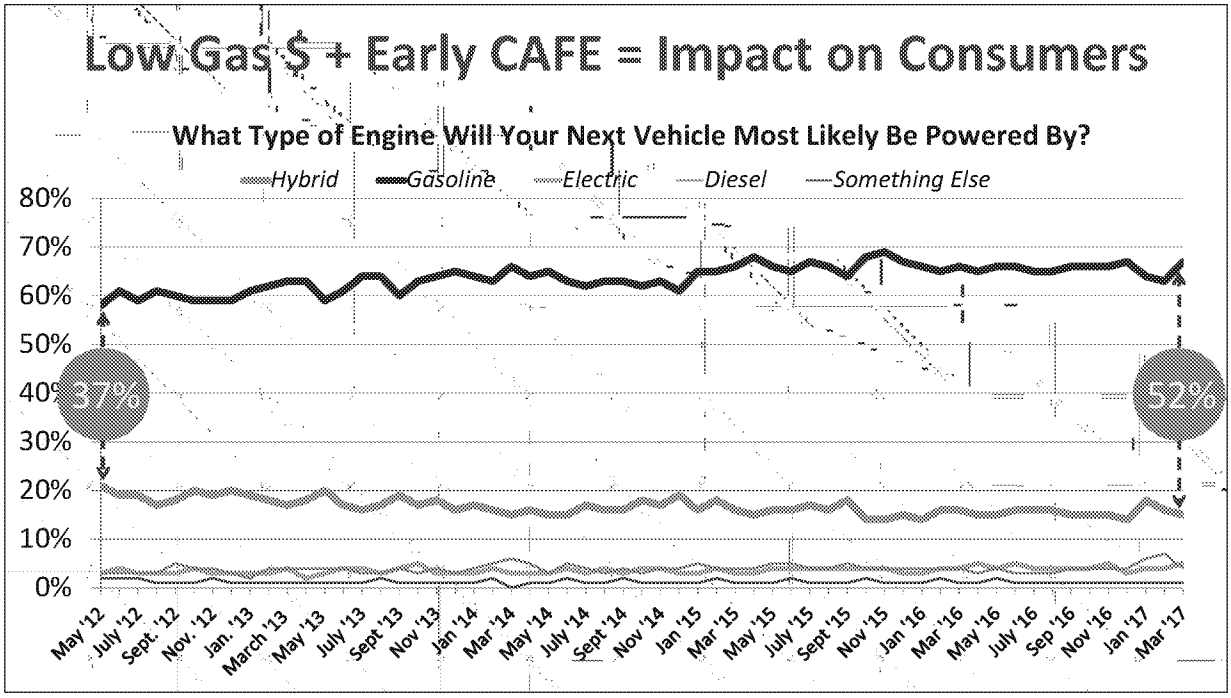
2016
Percent Change in Sales From Prior Year
Total Vehicle Sales
Consecutive Up Years
Consecutive Down Years
Sourced and Compiled from Ward's Automotive


Price of Gas Way Below Original Projections
U.S. Crude Oil Production vs. Net Imports (Thousand Barrels per Day)
Percent of Total
Year
Domestic Production
Net Imports
Source: EIA 2016


Low Gas $ + Early CAFE = Impact on Consumers
What Type of Engine Will Your Next Vehicle Most Likely Be Powered By?
Hybrid
Gasoline
Electric
Diesel
Something Else
80%
70%
60%
50%
40%
30%
20%
10%
0%
37%
52%
May '12
July '12
Sept. '12
Nov. '12
Jan. '13
March '13
May '13
July '13
Sept '13
Nov '13
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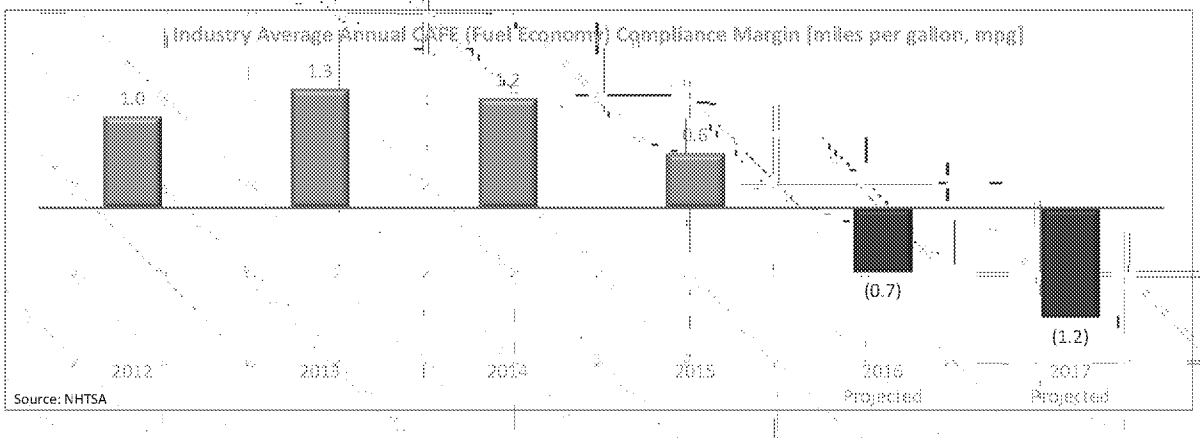
Mar '17

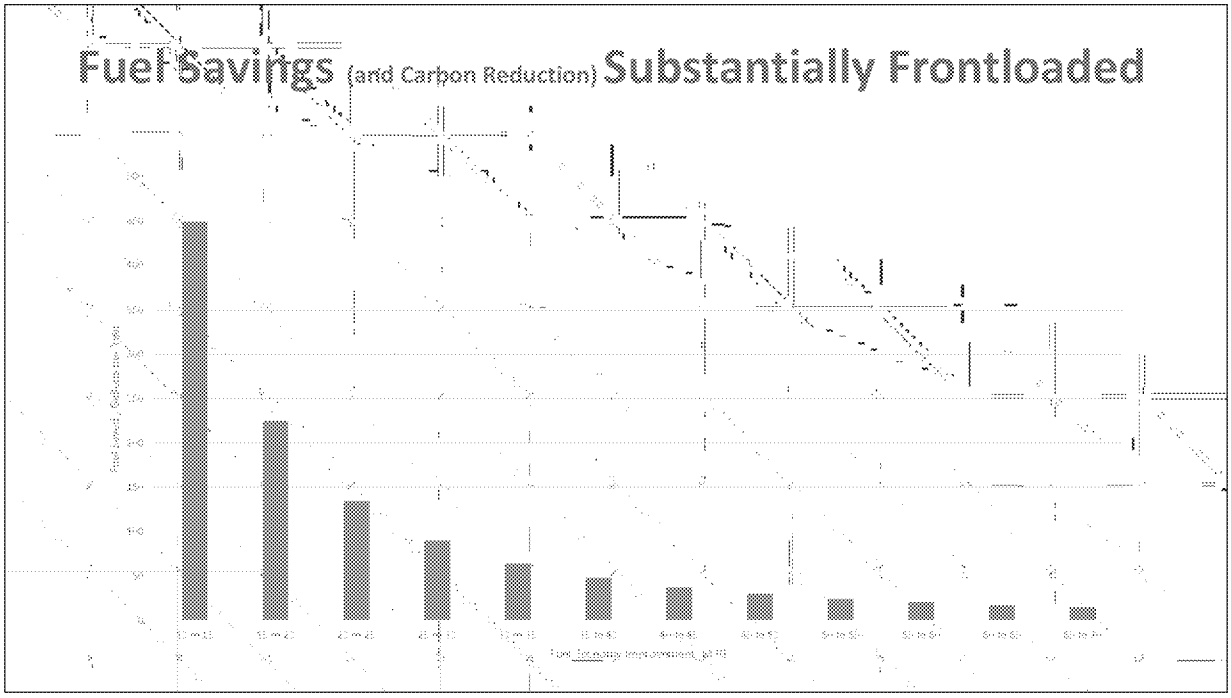
Compliance Trend Contradicts Theory

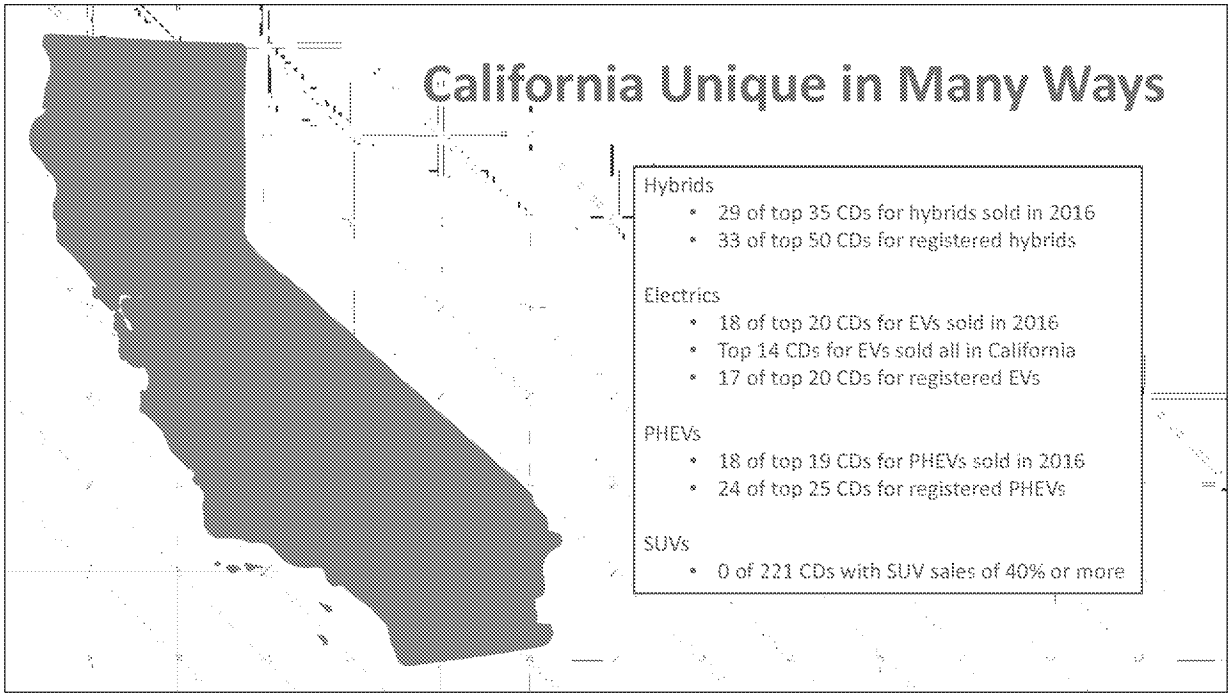


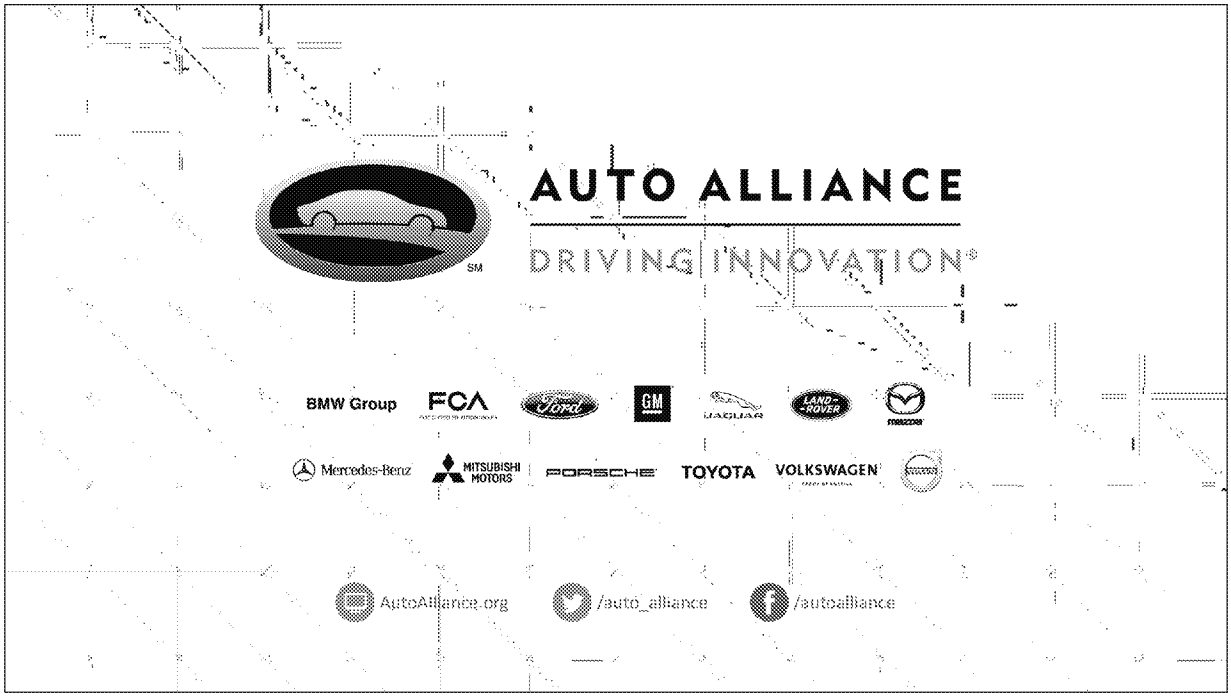
Source: NHTSA

Similar trends are observed for CAFE (fuel economy) compliance

- Between 2012 and 2014, manufacturers averaged 1.0 to 1.3 miles per gallon (mpg) better fuel economy than their standards
- In 2015, this compliance margin dropped in half to 0.6 mpg
- NHTSA projects that manufacturers on average will fail to meet the CAFE standards in 2016 and 2017


Fuel Savings (and Carbon Reduction) Substantially Frontloaded


California Unique in Many Ways
Hybrids
• 29 of top 35 CDs for hybrids sold in 2016
• 33 of top 50 CDs for registered hybrids
Electrics
• 18 of top 20 CDs for EVs sold in 2016
• Top 14 CDs for EVs sold all in California
• 17 of top 20 CDs for registered EVs
PHEVs
• 18 of top 19 CDs for PHEVs sold in 2016
• 24 of top 25 CDs for registered PHEVs
SUVs
• 0 of 221 CDs with SUV sales of 40% or more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Message

From: David Schwietert [DSchwietert@autoalliance.org]
Sent: 5/3/2017 12:58:21 PM
To: Bolen, Brittany [bolen.brittany@epa.gov]
Subject: FW: re: Auto Alliance follow up - Administrator Pruitt Meeting
Attachments: Auto Alliance Letter Administrator Pruitt April 27 2017.pdf; Joint Alliance - Global Petition for Rulemaking June 2016.pdf

I realized I had your email incorrect when I sent the following on Thursday of last week

Dave

From: David Schwietert
Sent: Thursday, April 27, 2017 5:49 PM
To: bollen.brittany@epa.gov; 'dravis.samantha@epw.gov' <dravis.samantha@epw.gov>
Cc: Jennifer Thomas <JThomas@autoalliance.org>; Chris Nevers <CNevers@autoalliance.org>
Subject: re: Auto Alliance follow up - Administrator Pruitt Meeting

Brittany and Samantha,

We wanted to pass along an electronic copy of the charts and letter that were raised during today's meeting with Administrator Pruitt.

Please let us know if you have any questions – both regarding the Harmonization Petition that was filed jointly with EPA and DOT last June as well as the Mid Term Review for MY 2022-2025 fuel efficiency standards for light-duty vehicles.

Note, when the Harmonization petition was filed last June, we requested a direct fine rule to resolve various issues in hopes of addressing those items ahead of the Draft Technical Assessment Report (TAR) that kicked off the Mid Term Review.
Soon after our petition was filed, EPA/DOT and CARB released their Draft TAR which now means that the issues outlined in the Harmonization petition would more effectively be addressed via a rulemaking process – or handled administratively via interpretations. Additionally, since late 2015 the Alliance has been seeking various Harmonization changes via legislation because certain changes require statutory modification.

It's also important to keep in mind that the Harmonization issues relate to near term compliance (prior to MY 2022) due to increasing disparity between CAFE and EPA credit and compliance requirements. Effectively, the concept of One National Program hasn't been realized and it can create instances in which an auto manufacturer can be in compliance with more stringent EPA requirements and still be forced to pay CAFE penalties. We have a host of other examples that we'd be happy to walk you through to underscore the changes that need to be made in keeping with the original 2010 and 2012 agreements that were advertised as "One National Program" for compliance purposes.

Thanks,

Dave

David Schwietert
Executive Vice President, Federal Government Relations & Public Policy
P: 202-326-5521 | dschwietert@autoalliance.org

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MITCH BAINWOL *President & CEO*

April 27, 2017

The Honorable E. Scott Pruitt
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Dear Administrator Pruitt:

On behalf of the Alliance of Automobile Manufacturers, Inc. ("Alliance"), I would like to thank you for helping to initiate two recent efforts that impact our industry:

1) EPA's reconsideration of the Final Determination on greenhouse gas standards for light-duty vehicles that was rushed through by the last Administration and;

2) Seeking public input on finding opportunities to streamline the complex array of existing regulations that could be repealed, replaced or modified to make them less burdensome.

The Alliance pledges to work with you on the two above actions and the attached harmonization petition as part of our industry's commitment to improve fuel economy and reduce emissions in a responsible and sustainable manner.

As mentioned in our letter to you dated February 21, 2017, the EPA's premature Final Determination improperly accelerated the single most important decision made by the EPA in recent history. By reconsidering the Final Determination, the EPA has exercised its authority to return to the promised Midterm Evaluation ("MTE") process. The MTE is a key component of the One National Program ("ONP") for fuel economy and greenhouse gas ("GHG") regulations in order to determine the appropriateness of Model Year ("MY") 2022-2025 standards. As your Notice of Intent explained, EPA is required under its own regulations to cooperate and interact with the National Highway Traffic Safety Administration ("NHTSA") during the MTE. Reconsideration of the Final Determination allows EPA to closely engage with NHTSA and to return to a well-reasoned process concerning MY 2022-2025 standards that fully accounts for market conditions, technology advancements, "real world" constraints, economic and employment impacts, previously dismissed or misunderstood stakeholder input, and recent compliance trends.

The Alliance appreciates EPA's commitment to revisit the existing record and consider new and more current data to ensure that "technological and economic concerns raised by the regulated community" are adequately considered and will be addressed moving forward. We look forward to working with you and your team on an informed revised Final Determination for the MY 2022-2025 standards that ensures auto manufacturers can meet the targets in a sustainable manner that does not sacrifice consumer choice, affordability, safety, employment, or fleet turnover. (Fleet turnover is a key indicator of a successful program because it demonstrates that consumers are finding that new and more technologically advanced vehicles are affordable which ensures the safest, cleanest, and most efficient new vehicles are on the road.)

The Alliance plans on working with NHTSA and EPA on the 2022-2025 MY Corporate Average Fuel Economy ("CAFE") and GHG standards and in addressing outstanding harmonization issues between the existing programs (attached). It is important to note that the Energy Policy and Conservation Act (EPCA) uniquely requires NHTSA to consider several key factors as part of its separate rulemaking. These factors include technological feasibility, economic practicability, and the effect of CAFE standards on motor vehicle safety.[1] As such, NHTSA is best suited to take a leadership role in both resolving harmonization issues and in determining final 2022-2025 standards.

The Alliance also looks forward to participating in EPA's implementation of Executive Order 13777: Enforcing the Regulatory Reform Agenda. We plan to both submit comments and work with the EPA's Regulatory Reform Task Force to identify specific rules that can be repealed, replaced, or modified while not affecting the continued advancements in fuel economy and emissions reductions. While an on-going iterative process is most likely necessary to identify regulatory opportunity, the major mobile source needs of the automotive industry can be broken down into three categories: revision and elimination of duplicative and unnecessary requirements, streamlining of certification and approval processes, and ensuring all vehicles and fuels are subject to performance-based metrics.

Duplicative and unnecessary requirements add time and complexity to the development and sale of new vehicles. Multiple vehicle regulatory programs at the Federal and State levels[2] require separate and duplicative reporting, accounting, and testing. For example, EPA and California have adopted nearly identical procedures for testing and reporting. The EPA should work with California and related stakeholders to either eliminate these duplicative procedures or apply broad "deemed to comply" provisions.

Streamlining the certification and approval processes is also important to industry. Highly concerning is the increased uncertainty and delays to the certification process caused by recently added undefined portable emissions measurement testing, unclear interpretation of auxiliary emissions control devices, and inconsistent approvals of GHG off-cycle credit requests. More certainty is needed for an already highly regulated industry. Regulatory interpretation is at the root of many of the certification challenges that the industry is facing and could be addressed either via guidance or through regulatory modifications.

While we encourage streamlining of the certification process, we are concerned over recent news surrounding the Administration's proposed budget cuts for the agency and the possible negative implications for vehicle certification. Although streamlining may assist the Administration to achieve some of the proposed budgetary goals, the Alliance would like to point out that EPA staff engaged in vehicle certification are critical to our industry and the economy. In addition, fees are currently structured to cover certification and compliance costs. We would be happy to follow up regarding the current fees that manufacturers already provide for critical EPA operations.

Lastly, equal treatment across all fuels and vehicle technologies is another key factor in ensuring a level playing field among automotive competitors. Automobile manufacturers should

---

1 Energy Policy and Conservation Act, as amended, 49 U.S.C. § 32902(f).

2 EPA GHG, California Air Resources Board ("CARB") GHG, NHTSA CAFE, Section 177 State GHG programs, CARB Zero Emissions Vehicle Program ("ZEV"), Federal On-Board Diagnostics ("OBD"), CARB OBD, Section 177 State ZEV and LEV programs, EPA Tier 3, and ARB LEV 3.

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not be held responsible for emissions associated with the production of electricity ("upstream emissions") as has always appropriately been the case for petroleum products. This includes both upstream fuel accounting and test procedures. As described in past Alliance comments, manufacturers should not carry the burden of addressing emissions from the production of fuels by other regulated entities that are completely independent of automotive manufacturers. Fuels should not be discredited or penalized at the tailpipe, but rather what is measured should be reported. Furthermore, diesel-fueled vehicles should be allowed the same durability procedures as similar advanced gasoline technology vehicles.

Once again, thank you for the opportunity to share our ideas. The Alliance and its members are highly interested in both regulatory reform and fuel economy standards. We intend to participate in upcoming regulatory reform stakeholder events and follow up with you and your staff on additional suggestions and specifics. We look forward to working with you to further reduce emissions and alleviate unnecessary regulatory burdens while improving fuel economy in a sustainable manner.

Sincerely,

Mitch Bainwol

Attachment: Letter from Mitch Bainwol and John Bozzella to Administrator McCarthy and Administrator Rosekind Re: Petition for Direct Final Rule with Regard to Various Aspects of the Corporate Average Fuel Economy Program and Greenhouse Gas Program.

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GlobalAutomakers

Mark Rosekind, PhD
Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue, S.E.
Washington DC 20590

June 20, 2016

Gina McCarthy
Administrator
Environmental Protection Agency
Office of the Administrator 1101A
1200 Pennsylvania Avenue, N.W.
Washington DC 20460

Re: Petition for Direct Final Rule with Regard to Various Aspects of the Corporate Average Fuel Economy Program and the Greenhouse Gas Program

Dear Administrators Rosekind and McCarthy:

This is a petition for a Direct Final Rule pursuant to 49 CFR § 553.14 and 5 U.S.C. § 553(e) requesting that the National Highway Traffic Safety Administration (NHTSA) and the U. S. Environmental Protection Agency (EPA) exercise their authority[1] to address various inconsistencies between the Corporate Average Fuel Economy (CAFE) regulatory program and the light-duty vehicle greenhouse gas (GHG) emissions regulations and to address additional inefficiencies in the programs.

The Petitioners, the Alliance of Automobile Manufacturers and the Association of Global Automakers (jointly known as the trade associations), are trade associations representing manufacturers of automobiles, as defined by the Energy Policy and Conservation Act (EPCA), 49 U.S.C. § 32901, et. seq..[2] The Petitioners submit this petition on behalf of their member companies.

[1] 49 USC § 32901 et. seq.

[2] The Alliance of Automobile Manufacturers is an association of 12 vehicle manufacturers which account for roughly 77% of all car and light truck sales in the United States. These members are BMW Group, FCA US LLC, Ford Motor Company, General Motors, Jaguar Land Rover, Mazda, Mercedes-Benz USA, Mitsubishi Motors, Porsche Cars North America, Toyota, Volkswagen Group of America, and Volvo Car USA.

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The actions requested are appropriate as a Direct Final Rule because they are essentially technical amendments relating to inconsistencies, errors, or procedural issues with respect to the CAFE and GHG programs. They do not impact the stringency of the standards as originally intended, nor are they contrary to the underlying analyses upon which the standards were based. The Petitioners seek expeditious action on the requested changes in order to address pending issues affecting many of our members, and to provide certainty in compliance planning.

On May 21, 2010, President Obama issued an Executive Order directing NHTSA and EPA to develop a "coordinated national program" of "joint Federal standards" to improve automobile fuel efficiency and reduce GHG emissions from light-duty vehicles. The National Program was premised on harmonization between the two programs. Many trade association member companies entered into Commitment Agreements with NHTSA and EPA through which they committed to abide by a harmonized set of CAFE and GHG standards for Model Years 2012-2025.[3]

The specific regulatory changes that the trade associations request are set forth in detail in this petition, along with supporting material demonstrating that the proposed changes are aligned with widely accepted policy goals, are technically sound, and are consistent with the relevant statutes. Some of the requested changes relate to aspects of the CAFE rules that result in a greater level of stringency than the GHG program. The CAFE standards are required to be set at a level that is technologically and economically feasible without the need to pay CAFE fines. To the extent that discrepancies and correctable inefficiencies in the program could force manufacturers to pay CAFE fines despite being able to meet the GHG standards, the CAFE standards are beyond what should be considered "maximum feasible." This petition does not address the feasibility of the augural CAFE standards for MYs 2022-2025, and making the changes requested here would not have a material impact on the feasibility of those standards. Rather, these changes are necessary to bring the overall CAFE program into better alignment with the "maximum feasible" level of fuel economy for MYs 2010-2021.

The National Program is Premised on Harmonization

From the beginning, the National Program was intended to result in a joint rule to set standards for both the GHG and CAFE programs that would allow automakers to comply with both programs through a single unified fleet. As noted by the agencies when announcing the MY 2017-2025 standards: "the goal . . . is to establish harmonized federal standards such that automobile manufacturers will be able to build a single light-duty national fleet that satisfies all

[3] The Commitments from the Petitioners and from EPA and NHTSA were set forth in letters dated May, 2009 (with regard to the MY 2012-2016 standards), May, 2010 (with regard to continuing the process), and July, 2011 (with regard to the MY 2017-2025 standards).

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federal and state requirements, while enabling consumers to still have a full range of vehicle choices."[4]

The National Program has been operational since MY 2012, and both manufacturers and the agencies have now had the benefit of experiencing how the elements of the programs and the market have impacted the ability of manufacturers to comply with both programs through a single fleet and technology array.[5] With the perspective of hindsight, it is clear that certain discrepancies between the two programs have prevented the level of harmonization sought and anticipated. Some manufacturers are projecting that, despite being able to comply with the numerically more stringent GHG standards, they are likely to be in a position to pay CAFE fines. This was not the intent of the National Program.

Petitioners' member companies anticipate that some of these impediments, which are apparent already for purposes of the MY 2012-2016 standards, will continue to be impediments for MYs 2017-2025.

The Petitioners acknowledges that EPCA contains certain constraints preventing full harmonization between the two programs. This petition does not request that the agencies attempt to harmonize the CAFE and GHG programs in a manner that contravenes statutory directives. Certain aspects of the programs will require legislative change to ensure consistency, and include the following:

> EPCA limits the maximum increase in any compliance category attributable to transferred credits. *See* 49 U.S.C. § 32903(g)(3). The GHG program includes no such limitation, and therefore offers a more significant incentive to deploy advance technologies early in order to cover unexpected market fluctuations, product planning assumptions that prove inaccurate, product changeover plans, or to provide credits to the market.
>
> EPCA limits the number of years an earned credit may be applied to a manufacturer's compliance calculation. EPCA allows credits to be used for five model years forward and for three model years back. EPA has harmonized with this constraint, but further allowed a one-time carry forward to allow credits earned in MYs 2010-2016 to be used through

[4] During the initial implementation of the National Program, the agencies noted in the 2010 rule that "NHTSA and EPA's standards would require *slightly different* fuel efficiency improvements." 75 Fed. Reg. 25324, 25342 (May 7, 2010) (emphasis added). The agencies did not expect significantly different fuel efficiency improvements in order to meet the CAFE standards in addition to the GHG standards.

[5] As described in more detail below, some aspects of the program have been applied to MYs prior to 2012. Where appropriate, the agencies should adopt the changes in the CAFE program beginning with the same model year that they became operative in the GHG program.

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MY 2021. Due to the statutory limitation, that same consideration cannot be accorded within the CAFE program.[6]

The agencies, however, have the ability to address a number of other inconsistencies without jeopardizing the fuel consumption benefits associated with the standards. In particular, and for the reasons set forth below, petitioners request that the agencies harmonize the programs as follows:

The Petitioners request that EPA and NHTSA calculate the fuel economy for a manufacturer's fleets for MYs 2010-2016 taking into account off-cycle technologies at the same levels and in the same way as EPA accounts for those technologies in the GHG program. Doing so would not erode the overall benefits of the CAFE standards or the National Program. The Petitioners recognize that EPA, in conjunction with NHTSA, has taken into account such off-cycle technologies in calculating compliance with the MYs 2017-2025 standards. Similar treatment would be just as appropriate with regard to the earlier model years consistent with EPA's recognition of off-cycle technology beginning in 2010.

The Petitioners request that EPA and NHTSA calculate the fuel economy for a manufacturer's fleets for MYs 2010-2016 taking into account air conditioning efficiencies at the same levels and the same ways as EPA is accounting for those efficiencies in the GHG program. Below we provide an approach that would grant such credits while also accounting for the differences in the stringency of the GHG and CAFE standards that was based on originally not having included these credits in the CAFE standards.

The Petitioners request that NHTSA apply the adjustment factor, beginning in Model Year 2011, when credits are carried forward or carried back within a compliance category, as well as when they are traded and transferred. The adjustment factor in 49 C.F.R. Part 536 was established by NHTSA in response to the Congressional mandate to ensure, when creating a program for trading credits between manufacturers, that overall oil savings remains the same. EPA has a different approach to ensuring the consistency of the benefits in the GHG program. The change being requested in this petition would help to harmonize the two approaches since the adjustment factor equates the CAFE credit to a linear function similar to the way in which credits are applied in the GHG program.

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[6] EPA has made additional allowances to harmonize the GHG program with the CAFE program despite an absence of statutory constraints. For example, EPCA specifies certain values for dual-fueled vehicles, which values EPA has adopted through MY 2015. Additionally, for purposes of establishing CAFE standards, EPCA assumes that fuel economy will be measured only with regard to fuel consumption during vehicle travel. The CO_2 program also accounts for emissions reductions that are not associated with the fuel economy cycle testing. EPA and NHTSA have resolved this discrepancy by recognizing that EPA has the authority to determine how to calculate fuel economy, an authority which allows EPA to take such "off-cycle" improvements into account and provide appropriate incentive in both programs for the substantial benefits represented by such technologies.

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The Petitioners request that NHTSA reconsider its decision not to harmonize with EPA by using the same, fixed Lifetime Vehicle Miles Traveled (VMT) values in the adjustment factor for MYs 2011-2016. NHTSA's VMTs for MYs 2011-2016 are generally lower than those derived from the 2009 National Household Travel Survey, even without the VMT growth rate assumed by the agencies, with the result that the adjustment factor is artificially low. As noted in the rulemaking analyses, while EPA's approach is similar to NHTSA's approach, it provides for better year-over-year consistency and accounts for the external factors that impact the VMT calculation. Since the fixed VMT value being employed incorporates an average which includes the earlier model years, applying it to those model years is analytically consistent.

Petitioners request NHTSA revise the definition of the term "transfer" in 40 CFR 536.3 to be consistent with language in the 2010 preamble of the proposed rulemaking for 2017-2025 GHG/CAFE standards. This revision would more closely align the NHTSA credit transfer program with that of the EPA GHG provisions as was the expressed intent in the 2010 preamble language.

In addition to the above, the Petitioners request that the agencies allow manufacturers to manage their credit supply and use. We note that, while the manufacturer model year reports[7] track certain credits separately, such as the off-cycle credits, and appear to allow manufacturers the ability to apply either those credits or over-compliance credits as they choose, in a recent publication EPA stated instead that technology credits must be applied before any over-compliance credits are applied.[8] The Petitioners request that, rather than imposing a priority system on the application of credits, the agencies allow manufacturers to choose how to apply their available credits.

The Petitioners also request that each agency take the following actions. While not giving rise to direct conflicts between the programs, the following issues involve potential difficulties that could lead to compliance disparities and/or that are inconsistent with the original intent of the programs.

The Petitioners request that NHTSA adjust the minimum domestic passenger car standard for MYs 2012-2016 to reflect 92% of the required average passenger car standard taking into account the fleet mix as it occurred, rather than what was forecast. Doing so better aligns the overall CAFE performance values with real world results and EPA's calculations, and is fully consistent with the statute.

The Petitioners request that EPA and NHTSA provide for a default acceptance of petitions for off-cycle credits, provided that all required information has been provided. Limited agency resources have delayed the processing of these petitions, and the delay

[7] See 40 CFR 600.512-12

[8] Environmental Protection Agency. "Greenhouse Gas Emissions Standards for Light-Duty Vehicles – Manufacturers Performance Report for the 2014 Model Year" (EPA-420-R-15-026). December 2015. (P. 17)

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impedes manufacturers' ability to plan for compliance or make investment decisions. Streamlining the process will further promote a more efficient and better harmonized National Program.

The Petitioners request that EPA remedy the equation applied to calculate the multiplier credits available in the GHG program. As the agency is aware, the calculation that is currently in the regulatory text does not reflect the intent, with the result that manufacturers earn fewer multiplier credits than was originally intended. This important flexibility was intended to encourage the ongoing production of zero emission vehicles, and achieving the full flexibility is particularly important in an environment of lower gasoline prices. Although not directly related to harmonization, the Petitioners believe that it would be appropriate for EPA to additionally address this error when processing this petition.

The above items are appropriate for the agencies to handle through a Direct Final Rule. The requested modifications would change neither the stringency levels of the standards themselves nor the overall benefits achieved through the National Program. The modifications requested in this petition are therefore suited to a Direct Final Rule. While there may be other opportunities for EPA and NHTSA to enhance harmonization between their two programs, the items discussed in this Petition represent a meaningful step in the right direction.

Specific Requests

This section sets forth the specific requests for modifications to the regulations, along with the supporting rationale for each request.

1. Include Off-Cycle Credits in the CAFE Calculation for MYs 2010-2016

The agencies should take appropriate steps to calculate corporate average fuel economy for MYs 2010-2016 more consistently with how corporate average fuel economy is to be calculated for MYs 2017-2025 by including in the CAFE compliance calculation the same off-cycle credits applied in the GHG program for earlier model years. Significantly, EPA acknowledged off-cycle credits beginning with MY 2010.

In 2012, EPA and NHTSA finalized action to acknowledge off-cycle credits equally in the CAFE program through EPA's authority to calculate a manufacturer's fuel economy performance. NHTSA, however, resisted applying those credits to earlier model years as EPA had done.

NHTSA's decision not to do so was premised on an erroneous assumption that NHTSA had fully accounted for the benefits of those technologies in the later model years, while it had not done so for earlier model years. In fact, however, neither EPA nor NHTSA took those benefits into account (instead creating a pure incentive) and, therefore, the agencies can maintain

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consistency by providing the credits in both programs for all model years, starting with MY 2010.

Significantly, the GHG standards -- like the corresponding CAFE standards -- did not include any quantification of the impacts of the off-cycle credits approved for use during MYs 2012-2016. 75 Fed. Reg. at 25438 ("Because these technologies are not nearly so well developed and understood, EPA is not prepared to consider them in assessing the stringency of the CO_2 standards").[9] Similarly, the agencies did not consider the benefits of off-cycle technologies in setting the standards for MYs 2017-2025, other than the 2-cycle benefits of stop-start and active aerodynamics.[10]

NHTSA nevertheless declined to apply the same off-cycle credits to earlier model years as EPA had done, noting only that "NHTSA did not take such credits into account when adopting the CAFE standards for those model years. As such extending the credit program to the CAFE program for those model years would not be appropriate." 77 Fed. Reg. at 62840. That statement, however, appears inconsistent with the considerations of off-cycle credits as more specifically described within the rulemaking analyses. Indeed, in addition to the fact that neither EPA nor NHTSA accounted for those benefits – other than the 2-cycle benefits of stop-start and active aerodynamics in the MY 2017-2025 rule -- NHTSA's analysis of "maximum feasibility" in the 2010 preamble makes clear that the agency did in fact consider all relevant technologies, and did so in a way that the agency announced were "consistent standards among all components of the National Program." 75 Fed. Reg. at 25607. [11]

The Petitioners request that the agencies reconsider calculating fuel economy for the earlier model years, and applying the same off-cycle credits offered in the GHG program in the CAFE program as well.

Recommendation: Section 600.510-12 Calculation of average fuel economy and average carbon-related exhaust emissions. Subsection (c)(1):

Change From:

(i) Except as allowed in paragraph (d) of this section, the average fuel economy for the model years before 2017 will be calculated individually for each category identified

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[9] Consistent with the fact that neither EPA nor NHTSA included off-cycle credits in their stringency analyses, NHTSA did not adjust its standards to account for off-cycle credits when EPA adopted them. The result is that, while the stringency of the standards is nominally the same as it regards off-cycle technology (other than air conditioning), EPA provided a full incentive for the introduction of innovative and novel technologies during the MY 2012-2016 timeframe, while NHTSA did not.

[10] The agencies noted that "the ability to generate off-cycle credits and increases in fuel economy for use in compliance will not affect or change the stringency of the GHG or CAFE standards established by each agency."

[11] Although EPCA does not require that CAFE standards meet a cost/benefit analysis, the agency noted that it is permitted to conduct one. See, e.g., 75 Fed. Reg. at 25553 and Center for Biological Diversity v. NHTSA, 508 F.3d 508 (9th Cir. 2007) The substantial benefits of the CAFE standards, which overlap with the benefits of the overall National Program, illustrate that the CAFE program, as modified, would continue to provide substantial societal benefits far beyond the societal costs. There would be no erosion of the beneficial impact of the CAFE standards.

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in paragraph (a)(1) of this according to the provisions of paragraph (c)(2) of this section.

(ii) Except as permitted in paragraph (d) of this section, the average fuel economy for the 2017 and later model years will be calculated individually for each category identified in paragraph (a)(1) of this section using the following equation:

Average MPG = 1/[1/MPG-(FCIVac + FCIVoc + FCIVpu)]

Change to:

(i) Except as permitted in paragraph (d) of this section, the average fuel economy for the 2010 through 2016 model years will be calculated individually for each category identified in paragraph (a)(1) of this section using the following equation:

Average MPG = 1/[1/MPG-(FCIVoc)]

(ii) Except as permitted in paragraph (d) of this section, the average fuel economy for the 2017 and later model years will be calculated individually for each category identified in paragraph (a)(1) of this section using the following equation:

Average MPG = 1/[1/MPG-(FCIVac + FCIVoc + FCIVpu)]

2. *Include Air-Conditioning Efficiency Credits in the CAFE Calculation for MYs 2010-2016*

For similar reasons, the agencies should also permit the use of air conditioning efficiency credits in MYs 2010-2016 consistent with the agencies' approach to MYs 2017-2025. In the rule for the earlier years, the agencies accounted for the difference of including these credits in one program but not the other by adjusting the overall stringency of the standards for MYs 2012-2016. While the GHG standards amounted to an overall targeted level of 35.5 mpg, the CAFE standards amounted to an overall combined fleet target level of 34.1 mpg in 2016. The Petitioners propose an approach that provides full harmonization by allowing such credits for MYs 2010-2016 while also taking into account the difference in the levels of the standard.

The disparity between the standards creates a situation in which a manufacturer that includes more efficient air-conditioning systems than those assumed by EPA for the industry as a whole is penalized in the CAFE program by not receiving the same consideration provided in the GHG program. The below graph illustrates the substantial, and unnecessary distinction, between the two programs due to this disparity:

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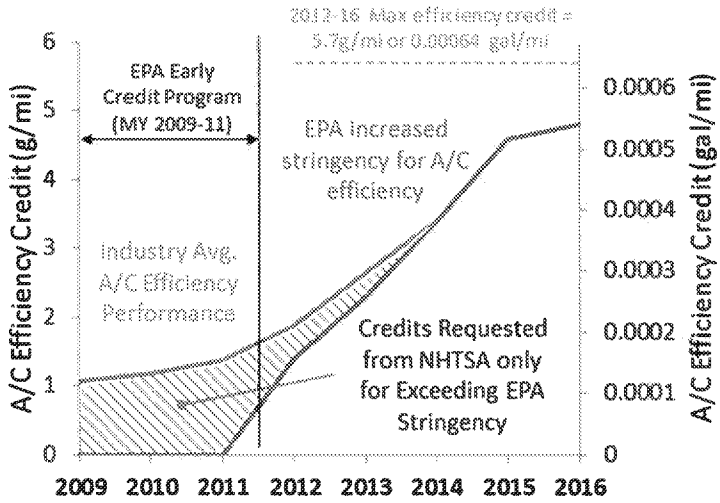

The blue line represents the amount of air-conditioner efficiency credits EPA projected for the fleet, including the stringency beyond the CAFE standards. The red line shows how the industry performed on average. The shaded area between the two shows the credits disregarded in the CAFE program, already accounting for the difference in the stringency of the standards.

In developing the program, EPA assumed a maximum benefit of 5.7 g/mi due to air conditioning efficiency credits. The chart below shows the projected penetration rate and the total CO_2 credit in the EPA program based on that penetration rate. The Petitioners suggest that the agencies apply a formula ($FCIV_{ACPROJ}$) to adjust that credit to account for the difference in stringency between the programs.

For example, if a manufacturer deployed MAC efficiency technology worth 3.1 g CO_2/mile across its MY 2013 fleet, the full credit for CAFE would have been a FCIV of 0.00035 (3.1/8887). However, since the stringency would also have been increased in MY 2013 by a FCIV of 0.00026, the net effect would be 0.00009 gallons/mile.

Model Year	2009-11	2012	2013	2014	2015	2016
Projected Penetration Rate	N/A	28%	40%	60%	80%	85%
CO_2 Credit (5.7 g/mi x Penetration Rate)	0	1.6	2.3	3.4	4.6	4.8
$FCIV_{AC\ PROJ}$ (gallons/mile, CO_2 credit/8887)	0	.00018	.00026	.00038	.00052	.00054

As with the off-cycle credits, the agencies can harmonize the programs while maintaining the same levels of overall stringency and remaining consistent with the analyses previously set

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forth. With the benefit of hindsight, it has become clear that the program disparities are unnecessarily undermining the intent of the National Program.

Recommendation: Section 600.510-12 Calculation of average fuel economy and average carbon-related exhaust emissions. Subsection (c)(1):

Change From:

(i) Except as allowed in paragraph (d) of this section, the average fuel economy for the model years before 2017 will be calculated individually for each category identified in paragraph (a)(1) of this according to the provisions of paragraph (c)(2) of this section.

Change to:

(i) Except as permitted in paragraph (d) of this section, the average fuel economy for the 2010 through 2016 model years will be calculated individually for each category identified in paragraph (a)(1) of this section using the following equation:

Average MPG = 1/[1/MPG-(FCIVoc)-max(0,(FCIVac –FCIVac proj))]

Where FCIVac proj is from the table above. FCIVoc is for off-cycle credits discussed above.

3. Apply the Fuel Savings Adjustment Factor Across Model Years

The Petitioners request that NHTSA modify the fuel savings adjustment factor by making it applicable when credits are carried forward or carried back within the same fleet. When Congress authorized a credit trading program between manufacturers, it also mandated that NHTSA ensure that total oil savings be preserved. *See* 49 U.S.C. § 32903(f)(1). Congress did not include the same provision in the provision mandating a credit transfer program between the fleets, but NHTSA decided that such a provision was appropriate. *See* 49 U.S.C. § 32903(g); 74 Fed. Reg. 14,452 (March 30, 2009). As a result, the adjustment factor established in Part 536 applies to both.

It has long been recognized that fuel savings is not linear with fuel consumption. The amount of fuel consumed by exceeding a standard by 1 mpg will vary based on the level of the standard. Although carry forward/carry back credits were used for many years, for much of that time – during the years of the Congressional CAFE freeze – the standards did not change and therefore credits were associated with the same amount of fuel savings from year to year. When developing the credit trading and credit transfer programs, and establishing the adjustment factor, consideration was not given to also applying the adjustment factor between model years within the same compliance fleet. The theory, however, remains the same and the adjustment factor would ensure that total oil savings are achieved regardless of when and where the credits are used. We recognize there may be some accounting challenges associated with implementation of

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this concept. We look forward to working with you to consider and develop an appropriate process to consider and account for these situations.

Recommendation: Section 536.4 Credits. Subsection (c):

Change From:

(c) Adjustment factor. When traded or transferred and used, fuel economy credits are adjusted to ensure fuel oil savings is preserved. For traded credits, the user (or buyer) must multiply the calculated adjustment factor by the number of its shortfall credits it plans to offset in order to determine the number of equivalent credits to acquire from the earner (or seller). For transferred credits, the user of credits must multiply the calculated adjustment factor by the number of its shortfall credits it plans to offset in order to determine the number of equivalent credits to transfer from the compliance category holding the available credits. The adjustment factor is calculated according to the following formula:

Change to:

(c) Adjustment factor. When traded or transferred and used, fuel economy credits are adjusted to ensure fuel oil savings is preserved. ***This adjustment factor also applies to credits used within a manufacturer's same fleet, i.e. domestic car to domestic car.*** For traded credits,..."

4. Apply the Harmonized VMT Estimates from MYs 2017-2025 to MYs 2011-2016

The Petitioners request that NHTSA reconsider its position with regard to the estimate of Vehicle Miles Traveled (VMT) used in the adjustment factor. For MYs 2012-2016, the agency had estimated VMT separately by model year and, in 2012 added an additional estimate for MY 2011. For MYs 2017-2025, NHTSA proposed to align with EPA and used a fixed VMT value approach. In response to a comment from the Alliance, NHTSA decided against applying the same fixed values to the earlier model years, stating that "we do not believe that the benefits of harmonization in this particular aspect for these model years outweigh the potential fuel savings losses that may occur if a change is made at this time." 77 Fed. Reg. at 63130.

With the benefit of hindsight, it is clear that no fuel savings were, in fact, lost. Instead, because VMT for the earlier model years, as derived from the 2009 National Household Travel Survey, were generally higher than NHTSA's projections, the amount of fuel savings per credit was actually undervalued. NHTSA should, at the least, update the VMT estimates to the best VMT estimates to reflect better the real world fuel economy results.[12]

[12] Petitioners acknowledge that adjusting the VMT estimates would present further challenges to those companies which may have traditionally run at a CAFE deficit and for whom accommodations were made to assist in the transition from a CAFE program permitting the payment of civil fines in lieu of compliance to the GHG program where non-compliance is not an option. Petitioners suggest that if a company is entitled to participate in the

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Estimated VMT represents an analysis that takes into account various factors impacting the extent to which consumers use their vehicles. Considerations wholly external to motor vehicle manufacturers and motor vehicle regulators impact each year's VMT. To derive a reasonable estimate, EPA conducted its analyses and averaged the calculated, anticipated VMT for MYs 2012-2030. While micro- and macro-economic considerations may impact VMT year-by-year, the averaging approach provides a consistent and reasonable basis (as evidenced by the fact that both agencies have adopted it prospectively) to proceed.

In the Regulatory Impact Analysis for MYs 2017-2025, the agencies noted that NHTSA's approach to estimating VMT closely approximated EPA's approach for those model years. (*See* 2012 Regulatory Impact Analysis, pp. 4-118-119). EPA made adjustments to its VMT modeling "to improve consistency with the CAFE model and with the analysis used to collect the VMT and survival rate data." (RIA, p. 4-121). The RIA further indicates that EPA's approach "is consistent with the MYs 2012-2016 rule. . . . The use of a single growth factor ensures consistency with the AEO projections about future micro and macroeconomic trends and underlying assumptions about consumer responsiveness to those trends." (RIA, p. 4-119, n. www)

According to the agencies' Regulatory Impact Analysis, the EPA approach is both similar to the NHTSA approach and similar to the approach EPA used for the earlier rulemaking. The EPA model is considered a reasonable estimate of future VMT, taking into account the various economic factors that impact VMT. Any assumed loss of fuel savings, therefore, would appear to be a "paper loss" based solely on NHTSA's estimate, not an actual loss based on statistical analyses the agencies have jointly decided to use prospectively.

Harmonizing VMT estimates for all model years of the National Program is particularly important to maintain consistency in manufacturer's compliance planning in light of market conditions. Credit flexibilities – particularly those that align more fully with EPA – are critical to providing the needed support to ensure that a company can meet the requirements of both programs with the same fleet of vehicles. Since NHTSA's VMT estimates appear to have artificially diminished the value of each credit, and since EPA's VMT approach has been modified to align well with CAFE and has been adopted by both agencies as a valid methodology, the Petitioners request that NHTSA reconsider its position and apply the EPA VMT estimates to MYs 2011-2016.

Recommendation: Section 536.4 Credits. Subsection (c):

Change From:

VMTe = Lifetime vehicle miles traveled as provided in the following table for the model year and compliance category in which the credit was earned;

---

transitional TLAAS program, and would be adversely impacted by the VMT adjustment, that company should be allowed a one-time option to retain the original VMT estimates.

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VMTu = Lifetime vehicle miles traveled as provided in the following table for the model year and compliance category in which the credit is used for compliance;

Change to:

VMTe= 195,264 for passenger cars and 225,865 for light duty trucks

VMTu= 195,264 for passenger cars and 225,865 for light duty trucks

5. *Revise NHTSA Credit Transfer Definition to be More Consistent with EPA*

The Petitioners request NHTSA revise the definition of the term "transfer" in 40 CFR 536.3 to be consistent with language in the 2010 preamble of the proposed rulemaking for 2017-2025 GHG/CAFE standards.

In the 2010 rulemaking, NHTSA made an effort to harmonize, to the extent allowable under the CAFE statute, its credit transfer program with EPA's GHG credit transfer approach. In the preamble to that rulemaking, NHTSA stated: "As a way to improve the transferring flexibility mechanism for manufacturers, NHTSA interprets EISA not to prohibit the banking of transferred credits for use in later model years." Thus, credits could be transferred from one fleet to another (subject to the statutory limitation in 49 USC 32903 (g)(3)), banked in the receiving fleet, and then the "credits could be carried forward or back without limit later if and when a shortfall ever occurred in that same fleet." 75 Fed. Reg. at 25666. Such a treatment of over-compliance credits is illustrated below:

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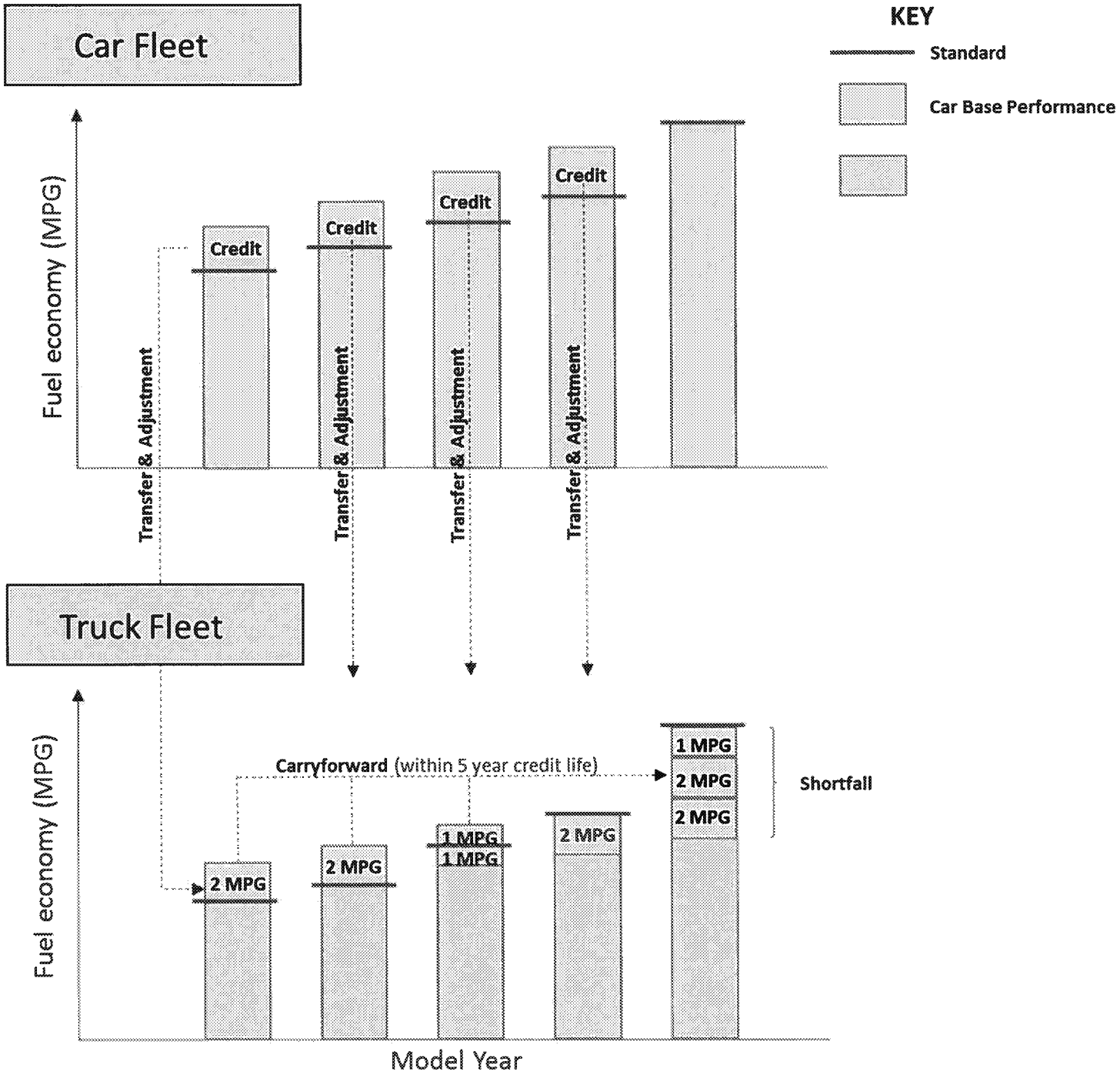

Note: Scenario showing 2 mpg credit transfer limit.

However, in a subsequent interpretation letter to a manufacturer, NHTSA moved away from the language in the preamble and stated that its intent was to apply the statutory limitation at the time the credits are used, as opposed to the time they were transferred and banked by a

manufacturer.[13] The result of this interpretation prohibits the banking and carryforward of credits illustrated in the figure above which is inconsistent with the preamble's stated intent "to harmonize better with EPA's CO2 program." This regulatory interpretation makes the NHTSA and EPA programs very different with regard to the flexibility to earn and use credits for over-compliance with required standards, since EPA allows unlimited transfer of GHG credits between a manufacturer's fleets. This disharmony creates unnecessary burdens and creates unnecessary complexity between the NHTSA and EPA programs.

Recommendation:

At the end of the existing definition of the term "Transfer" in 49 CFR 536.3, add the following:

> The limitation in 49 USC 32903(g)(3) shall apply at the time such credits are transferred. Once transferred, the credits are considered part of the receiving fleet and may be carried forward or back to the same extent that they could have before being transferred. The adjustment factor will be applied at the time credits are used to achieve compliance.

6. *Refrain From Imposing Unnecessary Restrictions on The Use of Credits*

Both the CAFE program and the GHG program were intended to allow manufacturers to earn credits and to utilize those credits as they deem appropriate to cover any shortfalls. Permitting the companies to manage their credits allows manufacturers to take into account future technology planning. This means that manufacturers with more credits than needed to cover an immediate shortfall should be able to choose which bank of credits to draw from to cover the shortfall and which to hold for future model years.

The Petitioners are concerned about the following language appearing in EPA's Manufacturer's Performance Report for the 2014 Model Year:

> Every manufacturer starts at the same place: by measuring the CO2 tailpipe emissions performance of their vehicles using EPA's City and Highway test procedures (referred to as the "2-cycle" tests). Then they may choose to apply a variety of optional technology-based credits to further reduce their fleet GHG emissions compliance value. The 2-cycle tailpipe CO2 value, when reduced by the net grams/mile equivalent of the optional credits, determines a manufacturer's model year performance and whether credits or deficits are generated by a manufacturer's model year fleet.

EPA-420-R-15-026 (Dec. 2015).

As stated, the language suggests that EPA will initially measure emissions based on the fuel economy testing, and then apply any technology credits (such as off-cycle and air conditioning credits) to determine a manufacturer's fleet performance. Once that performance has been calculated, EPA will determine whether there are over-compliance credits earned or

[13] See letter from O. Kevin Vincent to Toyota dated July 6, 2011.

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available under the GHG program and NHTSA will determine whether there are over-compliance credits available under the CAFE program.

The problem with this approach is that it denies manufacturers the ability to get the full benefit of past model year credits that they have earned under the GHG and CAFE programs. Under the credit banking provisions of both programs, manufacturers may earn credits by overachieving the standards in one model year, and apply those credits to offset shortfalls in a future model year. Under the agencies' prescriptive approach to credit management, technology credits earned in the current model year must be immediately applied toward any deficits in the current model year. This approach forces manufacturers to use their credits in a sub-optimal way, and can result in stranded credits.

We suggest that a better approach to calculating compliance is to measure compliance based on each manufacturer's test results, and then allow the companies to apply earned credits as they see fit. Allowing for that flexibility allows each manufacturer to optimize its planning, and does not reduce overall benefits since the credits have already been earned. Unlike "credits" for advanced technologies and alternative fuel capability, which are included in the base fuel economy performance determination, credits earned for air conditioning leakage and efficiency and for the use of off-cycle technologies are tracked and reported separately for the car and truck fleets in the final model year reports.

Our suggested approach is consistent with the way in which the agencies interpreted credit management in the 2009 – 2011 model years ("early credits"), in which manufacturers were able to apply carry forward credits before current model year earned credits were applied. Manufacturers provided the pre-Model Year reports, in which certain credit categories (such as off-cycle credits and air conditioning leakage and efficiency credits) were tracked and listed separately.

Those credits, as well as other Averaging, Banking, and Trading (ABT) credits, should all be available to companies to apply as they see fit. By inserting an artificial priority on the application of those credits, the agencies are imposing the possibility that some credits may expire before they are allowed to be used. That devalues credit creation and unnecessarily detracts from the incentive to develop and deploy novel technology as early as possible.

The Petitioners request the agencies to reconfirm the original approach to allow manufacturers to manage and apply their credits, regardless of the origin of the credits in their accounts. While the current regulations do not preclude the continuation of this optimal credit management, the regulation should be clarified to inform future guidance.

Recommendation

Amend 40 CFR 86.1865(k)(5) to read as follows:

(5) Total credits or debits generated in a model year, maintained and reported separately for passenger automobiles and light trucks, shall be the sum of the credits or debits calculated in

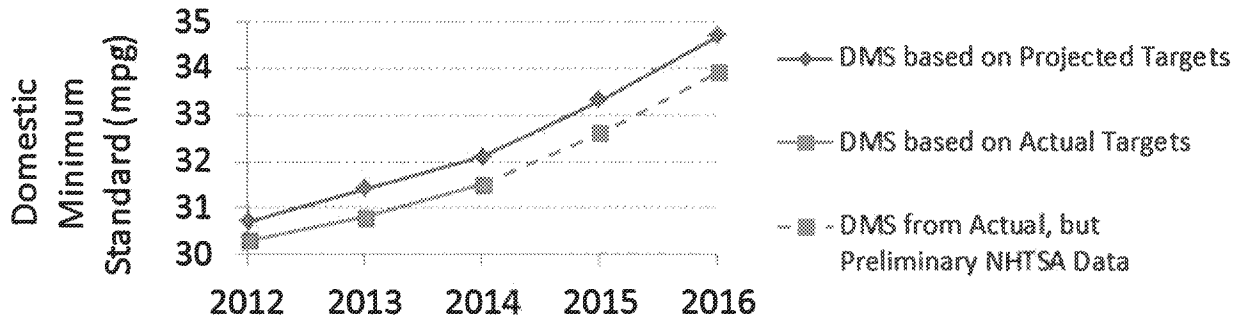
paragraph (k)(4) of this section, ***plus any credits earned in a prior model year and used by the manufacturer to fully or partially offset any such debits in accordance with paragraph (k)(7)(i) of this section, plus*** any of the following credits, if applicable, minus any N_2O and/or CH_4 CO_2-equivalent debits calculated according to the provisions of § 86.1818–12(f)(4):

(i) Air conditioning leakage credits earned according to the provisions of § 86.1867–12(b);
(ii) Air conditioning efficiency credits earned according to the provisions of § 86.1868–12(c);
(iii) Off-cycle technology credits earned according to the provisions of § 86.1869–12(d).
(iv) Full size pickup truck credits earned according to the provisions of § 86.1870–12(c).
(v) N2O and/or CH4 CO2-equivalent debits accumulated according to the provisions of § 86.1818–12(f)(4).

7. *Adjust the CAFE Minimum Domestic Passenger Car Standard to Reflect The Final Standard Applicable to Each Model Year*

NHTSA is required by statute to establish a minimum standard for domestic passenger vehicles that, effectively, is 92% of the average fuel economy projected for the combined domestic and imported passenger automobile fleets manufactured for sale in the United States by all manufacturers in the model year. The projected minimum standard must be published at the same time as the standards upon which they are based and promulgated. *See* 49 U.S.C. § 32902(b)(4).

Fuel economy standards under the attribute-based system should reflect a manufacturer's actual fleet mix. The minimum domestic passenger car standard was intended to protect small car production in the United States by imposing a minimum standard for domestically produced passenger cars. Macro-economic factors play a significant role, however, in the extent to which the projections manifest in later years. Neither the agency nor the manufacturers can fully predict and account for macro-trends impacting the motor vehicle market. As a result, and as NHTSA has intimated in the course of rulemaking, it is appropriate to revisit the projections to base them on the standards for passenger cars that emerge once the fleet mix is settled. The chart below shows the difference that has emerged between the domestic minimum standards based on NHTSA projections and the domestic minimum standard based on the actual passenger car targets.



We believe that the statutory intent was in fact to base the minimum domestic passenger car standard on the final "standard," and not merely on the initial estimate of what the standard might be in the future. This is reflected in the statutory reference to using either the 27.5 mpg traditional passenger car standard or the percentage of the attribute-based standard.

Establishing the minimum domestic passenger car standard in this way takes into account manufacturers' planning as well as unexpected market demand. As long as manufacturers have engaged in a good faith effort to meet the projected minimum domestic passenger car standard, they should not be penalized if market conditions drive consumer choices elsewhere. While the minimum domestic passenger car standard may be well-intentioned, it should be noted that noncompliance despite good faith efforts will not result in more domestic employment, but rather in the unintentional payment of CAFE fines.

Accordingly, NHTSA should adjust the minimum domestic passenger car standard, as finally entered, to reflect 92% of the required average fuel economy passenger car standards in order to maintain consistency with market conditions and the Congressional intent to ensure that efforts are made in good faith to ensure domestic investment in-line with external market forces.

8. *Correct the Multiplier for BEVs, PHEVs, FCVs, and CNGs*

The GHG program includes volume multipliers for low emission vehicles in order to promote the production of these disruptive technologies and to encourage consumer acceptance. Although not a direct harmonization issue, Petitioners' members have noted that the equation through which the number of earned credits is calculated is inaccurately stated in the regulations. The multiplier goes into effect with MY 2017 and this Direct Final Rule would be an appropriate place to correct the inadvertent error.

The illustration below provides a simple example of the credits received and credits inadvertently lost for a manufacturer that sells 5,000 BEVs in 2017-2021 MYs with the multiplier as finalized. The green bars represent the credit received with the multiplier as finalized in the 2017-2025 final rule and the red bars represent the intended credit.

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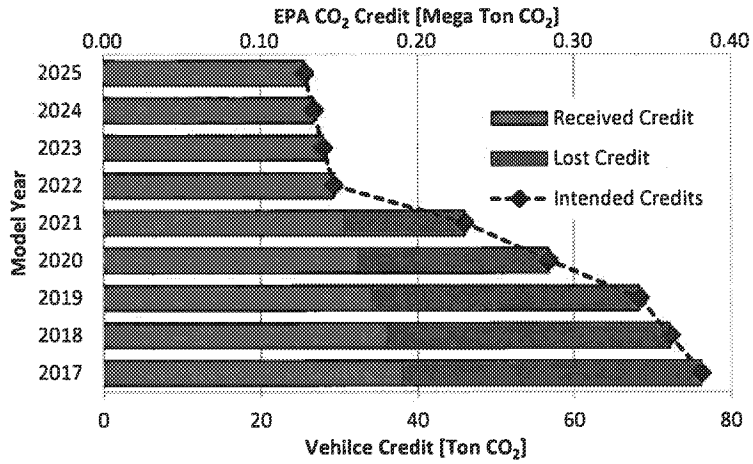

Originally, the volume multiplier was used to compute the fleet averaged carbon related exhaust emissions. The volume multiplier was incorrectly applied to the vehicle volume (when applicable) in 40 CFR 86.1866 (b) (3). The volume multiplier should be applied to the on-cycle vehicle credit (CO2,i Target – CREEi) of the preferred technologies (e.g. BEV, PHEV, CNG, or FCV). The Petitioners request that EPA correct the advanced credit multiplier calculation.

Recommendation

The methodology ultimately adopted should provide the incentive originally intended by the rule while respecting the fact that some manufacturers have already made plans according to the rules as they exist. Because the derivation of the multiplier equation involves several sections of the regulatory text, we are not proposing specific regulatory changes at this time. The final form of the changes, however, would reflect the following:

CFR Version $CO2\ Credits\ or\ Debits = (STD - CREE_{Avg}) \times VLM \times Production, [Mg]$

Corrected $CO2\ Credits\ or\ Debits = (STD_c - CREE_{Avg,c}) \times VLM \times Production, [Mg]$

CFR Averages $STD = \frac{\sum T \times Vol}{\sum Vol}, \left[{}^{g}/_{mile}\right]$ $CREE_{AVG} = \frac{\sum CREE \times Vol \times M}{\sum Vol \times M}, \left[{}^{g}/_{mile}\right]$

Corrected Averages $STD_c = \frac{\sum T \times Vol \times M}{\sum Vol}, \left[{}^{g}/_{mile}\right]$ $CREE_{AVG,c} = \frac{\sum CREE \times Vol \times M}{\sum Vol}, \left[{}^{g}/_{mile}\right]$

Where:
T = Model Type Footprint Target
M = Multiplier
C = "Corrected"

We look forward to working with the Agency in developing the appropriate regulatory changes.

9. *Provide an Improved Off-Cycle Credit Approval Process*

Although EPA has noted the importance of innovative technologies and encouraged the development of off-cycle credits, in some instances, the agency has been unable to process petitions for off-cycle credits as expected. This has occurred even when a manufacturer has provided all of the requisite information specified in the rule. Moving forward, of course, both agencies will be involved in managing that portion of the program and ensuring that the benefits of these innovative technologies are recognized.

In order to maintain the effectiveness of the off-cycle program, the agencies should:

- re-affirm that technologies meeting the stated definitions are entitled to the off-cycle credits at the values stated in the regulation;
- re-acknowledge that technologies shown to generate more emissions reductions than the pre-approved amount are entitled to additional credit;
- confirm that technologies not in the null vehicle set (the null vehicle being a MY2008 vehicle with naturally aspirated, port fuel injection, fixed cam timing engine, 4 speed transmission, and no weight reduction), but which are demonstrated to provide emissions reductions benefits constitute off-cycle credits; and
- modify the off-cycle program to account for unanticipated delays in the approval process by providing that applications based on the 5-cycle methodology are to be deemed approved if not acted upon by the agencies within a specified timeframe (for instance 90 days), subject to any subsequent review of accuracy and good faith.

Conclusion

The Petitioners seek immediate and direct action on the issues above because their resolution will significantly affect petitioners' ability to comply with the CAFE standards moving forward into MYs 2017-2021. While the later standards for MYs 2022-2025 will be subject to reconsideration, during the interim years petitioners face the prospect of complying with the numerically more stringent GHG standards while not being able – even with the same vehicle fleet and same technology application – to meet the corresponding CAFE standards.

The Petitioners request the agencies issue a Direct Final Rule adopting the modifications set forth above to bring to fruition and to improve the National Program.

The Petitioners look forward to working with the agencies during the mid-term evaluation and analyzing the various technical and policy considerations that will arise during that review.

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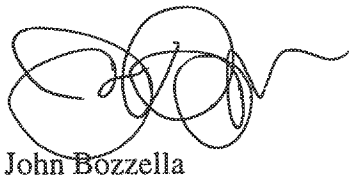
We would be glad to meet with Agency staff to answer any question about the material in this petition.

Sincerely,



Mitch Bainwol
President and CEO
Alliance of Automobile Manufacturers

John Bozzella
President and CEO
Association of Global Automakers

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Message

From: Bolen, Brittany [bolen.brittany@epa.gov]
Sent: 5/3/2017 3:20:34 PM
To: David Schwietert [DSchwietert@autoalliance.org]
Subject: Re: Auto Alliance follow up - Administrator Pruitt Meeting

It's okay, Dave. I understand I'm still not in the online staff directory.

Sent from my iPhone

> On May 3, 2017, at 9:00 AM, David Schwietert <DSchwietert@autoalliance.org> wrote:
>
> I realized I had your email incorrect when I sent the following on Thursday of last week
>
> Dave
>
> From: David Schwietert
> Sent: Thursday, April 27, 2017 5:49 PM
> To: bollen.brittany@epa.gov; 'dravis.samantha@epw.gov' <dravis.samantha@epw.gov>
> Cc: Jennifer Thomas <JThomas@autoalliance.org>; Chris Nevers <CNevers@autoalliance.org>
> Subject: re: Auto Alliance follow up - Administrator Pruitt Meeting
>
> Brittany and Samantha,
>
> We wanted to pass along an electronic copy of the charts and letter that were raised during today's meeting with Administrator Pruitt.
>
> Please let us know if you have any questions – both regarding the Harmonization Petition that was filed jointly with EPA and DOT last June as well as the Mid Term Review for MY 2022-2025 fuel efficiency standards for light-duty vehicles.
>
> Note, when the Harmonization petition was filed last June, we requested a direct fine rule to resolve various issues in hopes of addressing those items ahead of the Draft Technical Assessment Report (TAR) that kicked off the Mid Term Review.
> Soon after our petition was filed, EPA/DOT and CARB released their Draft TAR which now means that the issues outlined in the Harmonization petition would more effectively be addressed via a rulemaking process – or handled administratively via interpretations. Additionally, since late 2015 the Alliance has been seeking various Harmonization changes via legislation because certain changes require statutory modification.
>
> It's also important to keep in mind that the Harmonization issues relate to near term compliance (prior to MY 2022) due to increasing disparity between CAFE and EPA credit and compliance requirements. Effectively, the concept of One National Program hasn't been realized and it can create instances in which an auto manufacturer can be in compliance with more stringent EPA requirements and still be forced to pay CAFE penalties. We have a host of other examples that we'd be happy to walk you through to underscore the changes that need to be made in keeping with the original 2010 and 2012 agreements that were advertised as "One National Program" for compliance purposes.
>
> Thanks,
>
> Dave
>
>
>
> David Schwietert
> Executive Vice President, Federal Government Relations & Public Policy
> P: 202-326-5521 | dschwietert@autoalliance.org<mailto:dschwietert@autoalliance.org>
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> 803 7th Street, NW
> Suite 300
> Washington, DC 20001
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> Main Phone: 202-326-5500
> Main Fax: 202-326-5567
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> https://autoalliance.org/
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> Curious to know how the Auto sector impacts your state or district -- Click here<https://autoalliance.org/in-your-state/>. 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<https://autoalliance.org/economy/>.
>
> <image001.png>
> <image002.png>
> <Auto Alliance Letter Administrator Pruitt April 27 2017.pdf>
> <Joint Alliance - Global Petition for Rulemaking June 2016.pdf>

Message

From: Craig Glidden [craig.glidden@gm.com]
Sent: 4/28/2017 9:34:48 PM
To: Dravis, Samantha [dravis.samantha@epa.gov]
Subject: Follow Up to Meeting with Administrator Pruitt
Attachments: Attachment 1 - Gov Brown Letter to Auto Manufacturers.pdf; Attachment 2 - CARB 24MAR17 Board hearing transcript.pdf; Attachment 3 - 24MAR17 CARB Board hearing 2022-2025 press release.pdf

Dear Samantha -- Please convey my thanks to Administrator Pruitt for the good discussion we had on Wednesday regarding issues impacting the automotive industry. I wanted to provide you with three items referred to during that meeting:

1. Attachment 1 - March 15, 2017 letter from Gov. Brown to Alliance of Automobile Manufacturers;
2. Attachment 2 - Transcript of the March 24, 2017 public hearing of the California Air Resources (the pinpoint cite referred to is on page 184-5 of 347); and
3. Attachment 3 - Copy of the California Air Resources Board News Release of March 24, 2017.

To facilitate the recommencement of action on the Midterm Review of the 2022 – 2025 standards, we suggest the following immediate next steps.

- We suggest that the EPA, in coordination with NHTSA, re-open the public docket (EPA-HQ-OAR-2015-0827) on the draft Technical Assessment Report for 60 days and commence the process for reconsidering the Final Determination on a public timeline. We stand ready to work with your team as you coordinate with NHTSA.
- We suggest that Administrator Pruitt, along with Secretary Chao, convene a meeting of relevant stakeholders, including California, to find common ground as we simultaneously advance the formal process of the Midterm Review.

We appreciate very much the time of the Administrator and his team for our discussion and we look forward to working with you and all relevant stakeholders to advance the process. Many thanks, Craig

Craig B. Glidden
Executive Vice President & General Counsel
General Motors LLC
300 Renaissance Center, Detroit, MI 48265-3000
tel: 313.665.8331 e-mail: craig.glidden@gm.com
fax: 313.221.9735 mail code: 482-C39-B40

GENERAL MOTORS

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OFFICE OF THE GOVERNOR

March 15, 2017

Mitch Bainwol
President and CEO
Alliance of Automobile Manufacturers
803 7th Street NW
Washington, D.C. 20001

John Bozzella
President and CEO
Association of Global Automakers
1050 K Street NW
Washington, D.C. 20001

Dear Mr. Bainwol and Mr. Bozzella:

Your action to weaken vehicle pollution standards – standards your own members agreed to – breaks your promise to the American people.

Advances in fuel efficiency technology have worked for everyone. They have saved Americans money at the pump, cut oil consumption, reduced air pollution and helped fight climate change.

Putting this progress at risk is reckless. Your actions could cost the average car owner more than $1,650 per vehicle and make Americans consume billions more gallons of gasoline. This would increase our dependence on foreign oil and could raise greenhouse gas emissions by 540 million metric tons.

Please be advised that California will take the necessary steps to preserve the current standards and protect the health of our people and the stability of our climate.

Sincerely,

Edmund G. Brown Jr.

GOVERNOR EDMUND G. BROWN JR. • SACRAMENTO, CALIFORNIA 95814 • (916) 445-2841

MEETING

STATE OF CALIFORNIA

AIR RESOURCES BOARD

RIVERSIDE COUNTY ADMINISTRATIVE CENTER

BOARD OF SUPERVISORS CHAMBERS

FIRST FLOOR

4080 LEMON STREET

RIVERSIDE, CALIFORNIA

FRIDAY, MARCH 24, 2017

8:43 A.M.

JAMES F. PETERS, CSR
CERTIFIED SHORTHAND REPORTER
LICENSE NUMBER 10063

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Ms. La Ronda Bowen, Ombudsman

Ms. Emily Wimberger, Chief Economist

Ms. Analisa Bevan, Assistant Division Chief, ECARS

Mr. Pippin Brehler, Senior Attorney, Legal Office

A P P E A R A N C E S C O N T I N U E D

STAFF:

Mr. Joshua Cunningham, Branch Chief, ECARS

Ms. Annette Hebert, Division Chief, ECARS

Ms. Alexandra Kamel, Attorney, Legal Office

Mr. Jeffrey Lidicker, Air Resources Engineer, ECARS

Mr. Pippin Mader, Air Resources Engineer, Monitoring and Laboratory Division

Mr. Mike McCarthy, Chief Technology Office, ECARS

Ms. Anna Wong, Staff Air Pollution Specialist, Emissions Compliance, Automotive Regulations and Sciences Division(ECARS)

ALSO PRESENT:

Ms. Kitty Adams, Adopt a Charger

Ms. Fariya Ali, Pacific Gas & Electric

Mr. Marco Anderson, Southern California Association of Governments

Mr. Thomas Ashley, Greenlots

Ms. Betty Barberena, SALEF

Ms. Sutida Bergquist, Professional Engineers in California Government

Mr. John Boesel, CalStart

Mr. John Bozzella, Association of Global Automakers

Dr. Rasto Brezny, Manufacturers of Emission Controls Association

Mr. Tom Cackette, Environmental Defense Fund

Mr. Fernando Cazeras, Trust for Public

A P P E A R A N C E S C O N T I N U E D

ALSO PRESENT:

Ms. Patricia Chen, LA Metro

Mr. Carlos Cortes, BTC Power, Inc.

Mr. John Dangberg, City of Sacramento, Mayor Darrell Steinberg

Mr. Steven Douglas, Alliance of Automobile Manufacturers

Ms. Allis Druffel, California Interfaith Power & Light

Mr. Harvey Eder, Public Solar Power Coalition

Mr. William Elrick, California Fuel Cell Partnership

Ms. Leah Feldon, Oregon Department of Environmental Quality

Mr. Steve Flynn, New York Department of Environmental Conservation

Mr. Chet France, Environmental Defense Fund

Ms. Genevieve Gale, Central Valley Air Quality Coalition

Mr. Larry Greene, Sacramento Metropolitan Air Quality Management District

Mr. Tom Gross, Southern California Edison

Ms. Irene Gutierrez, Natural Resources Defense Counsel

Ms. Cassie Halls, Shared-Use Mobility Center

Ms. Christina Heartquist, Consumer Federation of America

Ms. Megan Herzog, Conservation Law Fund

Mr. Henry Hogo, South Coast Air Quality Management District

Ms. Laurie Holmes, Motor and Equipment Manufacturers' Association

A P P E A R A N C E S C O N T I N U E D

ALSO PRESENT:

Ms. Bonnie Holmes-Gen, American Lung Association

Mr. Merlyn Hough, Lane Regional Air Protection Agency

Dr. Karen Jacpor, American Lung Association

Mr. Brendan Jones, Electrify America

Ms. Michelle Kinman, Environmental California Research & Policy Center

Ms. Christine Kirby, Massachusetts Department of Environmental Health

Mr. Rob Klee, Connecticut Department of Energy and Environmental Protection

Rev. Earl Koteen, Sunflower Alliance

Dr. Chris Langdon, Drucker School, Claremont Graduate University

Mr. Joel Levin, Plug In America

Mr. Mike Lewis, Pearson Fuels

Ms. Amy Lilly, Mercedez-Benz

Mr. Michael Lord, Toyota

Mr. Nicholas Lutsey, International Council of Clean Transportation

Mr. Bill Magavern, Coalition for Clean Air

Ms. Lisa McGhee, San Diego Airport Parking Company

Ms. Jennifer Moeller, Moms Clean Air Force

Mr. Ken Morgan, Tesla

Mr. Simon Mui, Natural Resources Defense Counsel

Ms. Hilary Norton, FAST LA

A P P E A R A N C E S C O N T I N U E D

ALSO PRESENT:

Mr. Graham Noyes, Low Carbon Fuels Coalition

Ms. Gloria Ohland, More LA

Ms. Kathryn Phillips, Sierra Club of California

Ms. Michelle Pierce

Ms. Julia Rege, Global Automakers

Dr. David Reichmuth, Clean Vehicles Program

Ms. Alisa Reinhardt, California New Car Dealers Association

Ms. Susana Reyes, City of LA, Office of Mayor Garcetti

Ms. Ashley Rosia-Tremonti, City of San Diego

Mr. Craig Scott, Toyota

Mr. David Schembri, EVgo

Ms. Anne Smart, Charge Point

Ms. Susana Reyes, City of Los Angeles, Office of Mayor Garcetti

Mr. John Shears, Center for Energy Efficiency and Renewable Technologies

Mr. Cory Shumaker, California Hydrogen Business Council

Ms. Anne Smart, Charge Point

Mr. Matt Solomon, Northeast States for Coordinated Air Use Management

Mr. Joe Sullivan, IBEW/NECA

Mr. Mike Swords, Los Angeles Cleantech Incubator

Mr. Ricky Teebay, County of Los Angeles

A P P E A R A N C E S C O N T I N U E D

ALSO PRESENT:

Ms. Eileen Tutt, California Electric Transportation Coalition

Mr. Desmond Wheatley, Envision Solar

Mr. John White, Center for Energy Efficiency and Renewable Technologies, Hydrogen Business Council

Mr. Beau Whiteman, Tesla

Mr. Jerard Wright, BizFed

Mr. Andy Wunder, CERES

Mr. Kevin Zheng, SemaConnect

I N D E X

	PAGE
Pledge of Allegiance	1
Roll Call	2
Opening remarks by Chair Nichols	3
Item 17-3-11	
Chair Nichols	4
Ms. Bergquist	7
Item 17-3-8	
Chair Nichols	9
Executive Officer Corey	10
Staff Presentation	12
Mr. Klee	50
Ms. Kirby	56
Mr. Feldon	72
Mr. Solomon	74
Mr. Hogo	75
Mr. Bozzella	76
Mr. Douglas	79
Ms. Lilly	81
Mr. Lord	84
Mr. Mui	87
Mr. Gutierrez	89
Mr. Lutsey	92
Mr. France	95
Mr. Cackette	98
Dr. Brezny	104
Mr. Noyes	106
Mr. Morgan	108
Ms. Holmes-Gen	111
Mr. Tutt	113
Mr. Hough	115
Mr. Shumaker	117
Ms. Reyes	118
Ms. Phillips	120
Ms. Adams	122
Ms. Holmes	123
Mr. Boesel	126
Ms. Kinman	129
Ms. Drufffel	131
Mr. Lewis	132
Mr. Levin	134
Ms. Pierce	136
Dr. Reichmuth	138

I N D E X C O N T I N U E D

	PAGE
Ms. Heartquist	141
Ms. Moeller	143
Ms. Herzog	147
Ms. Smart	151
Mr. Wunder	153
Mr. Shears	155
Dr. Jacpor	157
Mr. Magavern	159
Ms. McGhee	161
Ms. Reinhardt	163
Rev Koteen	164
Mr. Scott	166
Mr. Eder	169
Mr. White	171
Board Discussion and Q&A	173
Motion	204
Vote	204
Afternoon Session	205
Item 17-3-9	
Chair Nichols	205
Executive Officer Corey	207
Chief Counsel Peter	208
Staff Presentation	210
Mr. Greene	239
Mr. Schembri	241
Dr. Langdon	242
Mr. Gross	246
Ms. Rege	247
Mr. Lord	248
Ms. Chen	249
Ms. Adams	251
Mr. Shumaker	252
Mr. Dangberg	254
Ms. Rosia-Tremonti	256
Ms. Reyes	258
Ms. Norton	260
Mr. Wright	261
Mr. Swords	262
Mr. Anderson	264
Mr. Magavern	266
Ms. Kinman	267
Mr. Teabay	268
Mr. Cazeras	270
Ms. Ohland	271

I N D E X C O N T I N U E D

	PAGE
Ms. Barberena	274
Ms. Halls	275
Mr. Cortes	277
Mr. Zheng	279
Ms. Ali	281
Dr. Reichmuth	282
Mr. Sullivan	283
Mr. Shears	285
Mr. Mui	286
Mr. Wheatley	288
Ms. Tutt	290
Ms. Ashley l	291
Ms. Smart	292
Ms. Gale	294
Mr. Whiteman	296
Mr. Elrick	298
Ms. McGhee	300
Mr. Eder	302
Mr. Jones	303
Board Discussion and Q&A	304
Motion	334
Vote	334
Public Comment	335
Mr. Eder	336
Adjournment	336
Reporter's Certificate	337

1 P R O C E E D I N G S
2 CHAIR NICHOLS: Good morning. If you could take
3 your seats, please.
4 I know there are people still making their way
5 through the security line, but I don't want to keep the
6 rest of the group waiting either.
7 Good morning and welcome. And we'll go through
8 our opening drill on Day 2 of the March Public Meeting of
9 the Air Resources Board.
10 So let's please rise for the Pledge of
11 Allegiance.
12 (Thereupon the Pledge of Allegiance was
13 Recited in unison.)
14 CHAIR NICHOLS: There's a nice photo in one of
15 the publications from yesterday's meeting that shows Sandy
16 and me and Barbara up in front, and makes it look as
17 though we've taken over the county of Riverside.
18 (Laughter.)
19 CHAIR NICHOLS: So in case anybody is
20 wondering --
21 (Laughter.)
22 CHAIR NICHOLS: -- we're only temporary visitors.
23 But we're very grateful to Riverside County for lending us
24 their board hearing room once again. It's a good place to
25 meet.

1 So if we can have the clerk please call the roll.
2 BOARD CLERK McREYNOLDS: Dr. Balmes?
3 BOARD MEMBER BALMES: Here.
4 BOARD CLERK McREYNOLDS: Mr. De La Torre?
5 BOARD MEMBER DE LA TORRE: Here.
6 BOARD CLERK McREYNOLDS: Mr. Eisenhut?
7 BOARD MEMBER EISENHUT: Here.
8 BOARD CLERK McREYNOLDS: Senator Florez?
9 Assembly Member Garcia?
10 Supervisor Gioia?
11 Senator Lara?
12 Ms. Mitchell?
13 BOARD MEMBER MITCHELL: Here.
14 BOARD CLERK McREYNOLDS: Ms. Riordan?
15 BOARD MEMBER RIORDAN: Here.
16 BOARD CLERK McREYNOLDS: Supervisor Roberts?
17 Supervisor Serna?
18 BOARD MEMBER SERNA: Here.
19 BOARD CLERK McREYNOLDS: Dr. Sherriffs?
20 BOARD MEMBER SHERRIFFS: Over here.
21 (Laughter.)
22 BOARD CLERK McREYNOLDS: Professor Sperling?
23 BOARD MEMBER SPERLING: Here.
24 BOARD CLERK McREYNOLDS: Ms. Takvorian?
25 BOARD MEMBER TAKVORIAN: Here.

BOARD CLERK McREYNOLDS: Vice Chair Berg?

VICE CHAIR BERG: Here.

BOARD CLERK McREYNOLDS: Chair Nichols?

CHAIR NICHOLS: Here.

BOARD CLERK McREYNOLDS: Madam Chair, we have a quorum.

CHAIR NICHOLS: That's great.

(Laughter.)

CHAIR NICHOLS: There really is no way we can move Dr. Sherriffs in?

Wait, there's --

BOARD MEMBER DE LA TORRE: I'll switch.

BOARD MEMBER BALMES: He's over here in the left bank.

CHAIR NICHOLS: I know.

BOARD MEMBER SHERIFFS: Look at all the microphones I get.

(Laughter.)

CHAIR NICHOLS: All right. Well, we'll just -- we'll remember to bring you in.

Good morning, everybody.

A couple of usual opening announcements. If you're planning on testifying on any of the items on today's agenda, we appreciate it if you would fill out your Request-to-Speak form in advance on one of the cards

1 outside or get it from the clerk. And she puts the list
2 together so it makes it much easier for us to know what's
3 going on.
4 We're planning on imposing our usual 3-minute
5 limit on speakers. Although, yesterday we got to the
6 point where we actually had to go down to a 2-minute limit
7 at the very end of the day, and it didn't work out too
8 badly. But by that time everybody was feeling more like
9 compressing their comments, so it worked out pretty well.
10 For safety reasons, I'll have to ask you to note
11 the exits at the rear of the room. In the event of an
12 alarm, we're to exit the building through those exits --
13 exit doors and go out of the building until there's an
14 all-clear signal.
15 And I believe that as far as opening comments,
16 that would be it.
17 We're really happy to kick off the day with
18 something unusual and very special; and that is a
19 recognition of ARB staff. We don't often take time during
20 our public meetings for any of the relatively routine
21 events that we hold where we single out people for special
22 merit during the course of the year. But this is a
23 recognition of something that was truly remarkable in the
24 history of ARB, and that was the breaking of the case on
25 the international scandal that we now know as the

1 Volkswagen defeat device.
2 Under the Clean Air Act, as everyone knows who's
3 here, California gets to set and enforce its own vehicle
4 standards. And it's thanks to this provision of the Clean
5 Air Act that Volkswagen's actions were actually uncovered.
6 The in-use compliance program that ARB operates
7 ensures that cars sold in California are still providing
8 emissions controls years after they leave the showroom.
9 We're fortunate that dozens of scientists, technicians,
10 engineers, and lawyers who are at the top of their fields
11 come to work here and are engaged in this and some of our
12 other programs.
13 We are also doubly blessed that our engineers
14 exhibited an unparalleled level of commitment and
15 dedication along with the intellectual imagination and
16 problem-solving skills to detect the defeat device that
17 had remained hidden from the eyes of other agencies around
18 the world, although it was hidden in plain sight for
19 almost a decade. I'm sure Volkswagen may have thought
20 that their engineers were able to keep this illegal
21 software hidden forever. But they didn't consider that
22 one day they would have to come face to face with the
23 collective ingenuity of our California engineers.
24 This case truly shows I think some of the best at
25 ARB, the dedicated professional staff from various

1 professions, using sound science and strong technical
2 know-how, to ensure that our programs and policies
3 actually deliver on the promise of cleaner air. It's not
4 just about writing regulations. It's about implementing
5 them and enforcing them.
6 ARB's success is not only shared with all of the
7 Californians who benefit from our programs, but it also I
8 think helps to achieve recognition for the professions
9 that they come from, particularly the engineering
10 professions, many of whom work in other parts of State
11 government and don't always get the opportunity to be
12 recognized.
13 So today, we are very honored that the
14 Professional Engineers in California Government
15 organization is recognizing our staff engineers from the
16 Volkswagen case with their highest honor. And to present
17 these awards to the engineers involved in uncovering the
18 Volkswagen defeat devise we are joined by President Elect
19 Sutida Bergquist of the Professional Engineers in
20 California Government. Following a brief introduction,
21 each of the awardees will rise to be recognized as their
22 names are called. And I ask that you please hold your
23 applause till the end of the roll call.
24 So I would now like to invite Ms. Bergquist to
25 the podium.

1 MS. BERGQUIST: Good morning. My name is Sutida
2 Bergquist. I am the president elect of the Professional
3 Engineers in California Government. I want to thank the
4 Air Resources Board and Chair Mary Nichols for allowing me
5 to speak briefly on behalf of our organization which
6 represents 13,000 State engineers.
7 Each year we honor the important work of the
8 employees we represent with our Professional Achievement
9 Award.
10 For 2016, PECG has decided be bestow this award
11 to more than 80 ARB engineers and related staff on the
12 board's Volkswagen Diesel Cheating Detection Team.
13 We have never given the award to so many people
14 at one time, but the impact of the team's services is
15 without precedent.
16 Two years ago the ARB asked a question: Why did
17 Volkswagen's so-called clean diesel engine pass smog
18 tests, but when driven the cars with the engine threw out
19 pollution that exceeded legal limits?
20 That question and the relentless pursuit of the
21 answer by VW Diesel Cheating Detection Team forced one of
22 the world's largest automakers to admit it's used
23 sophisticated software to trick emissions tests. Last
24 year, Volkswagens recalled 482,000 vehicles sold in
25 America. Another 8.5 million cars in Europe were

1 affected. At least six Volkswagen executives has been
2 charged with crimes. The company has admitted to several
3 crimes and has paid billions of dollars in fines.
4 France and Italy are investigating emissions from
5 diesel Volkswagens sold in their country.
6 And just last week German authorities searched
7 Volkswagen and Audi offices and ceased company records, as
8 the legal probes into the case widen again.
9 And it all started because of ARB's persistent
10 investigation.
11 Who knows how much damage was avoided because you
12 guarded the public good. Who knows how long the scheme
13 might have continued to secretly foul the environment and
14 harm public health if you weren't watching. Who knows how
15 many -- how many more of those vehicles would be on the
16 road right now churning up to 40 times the pollution that
17 the law allows had you not intervened.
18 Your work on this case has displayed to the world
19 our California government at its best.
20 I am honored to present the 2016 Professional
21 Achievement Award today. And I am aware that some of them
22 are some of the folks that work on this in Sacramento. So
23 I want to give the shout out to them as well, that because
24 of you it showcases the work that State engineers and
25 related professions perform every day, most of the time

with a little public recognition and sometimes with plenty of private pushback.

We will recognize employees individually at lunch in El Monte. In the moment, we will ask everyone on the team to stand and come forward for a photo with the Board.

Congratulations from PECG, and thank you service not only to our great state but to the world.

Thank you.

(Applause.)

MS. BERGQUIST: Can you stand up to please be recognized.

(Standing applause.)

(Photo taken.)

CHAIR NICHOLS: That was a fun way to start the day.

That photo is going to be one for the ages, really.

All right. Everybody can get settled.

The next item on today's agenda is a report from the staff on California's Midterm Review of the Advanced Clean Cars regulations.

Just a bit of history here. In January 2012, the Board approved regulations to significantly reduce both criteria pollution and greenhouse gas emissions from passenger vehicles and light-duty trucks for the 2015 and

later-model years.

As part of this package, the Board also ramped up the requirements for zero-emission vehicles in California starting in the 2018 model year.

At the conclusion of the January 2012 hearing, the Board directed staff to examine a number of outstanding issues pertaining to those regulations and report back to us as part of a midterm review.

The first issue: The appropriateness of the 2022 through 2025 model year national -- national greenhouse gas standards included a commitment for ARB to participate with the U.S. EPA and the National Highway Traffic Safety Administration in a federal midterm evaluation.

The second issue centered around the feasibility and timing for implementing California's one milligram per mile particulate matter standard for 2025 model year light-duty vehicles.

And a third area of issues included a review of the appropriateness of the zero-emission vehicle requirements for 2018 and subsequent model years.

The results of staff's assessment were published in a comprehensive midterm report released on January 18th, and they will be summarized in today's presentation.

Mr. Corey, would you please introduce this item.

EXECUTIVE OFFICER COREY: Yes. Thanks, Chair

1 Nichols.
2 California's was first to adopt light-duty
3 greenhouse gas emission standards. They began in model
4 year 2009. Since federal adoption of comparable standards
5 starting in 2012, we participated in a national program
6 provided California does not lose ground towards attaining
7 its own emission requirements and goals. To that end,
8 California added regulatory flexibility that has allowed
9 California vehicles to certify to national greenhouse gas
10 standards as an alternative to our own standards since
11 model year 2020 -- rather 2012.
12 It's worth mentioning that California neither
13 relinquished nor accepted any limit to authority to
14 control greenhouse gas emissions from motor vehicles by
15 agreeing to this regulatory flexibility.
16 Before we start the staff presentation on
17 California's midterm review, I'd like to mention the
18 conclusions of the federal midterm evaluation. On
19 November 30th, 2016, U.S. EPA proposed to determine that
20 the 2022 through 2025 model year passenger vehicle
21 greenhouse gas standards remain appropriate and no changes
22 to the regulations are warranted.
23 After considering all comments received in
24 response to the proposed determination, U.S. EPA confirmed
25 its findings in a final determination which was signed by

1 the administration on January 12th, 2017.
2 This determination is consistent with ARB staff's
3 own findings in our consideration of public comments that
4 supports maintaining the greenhouse gas standards and
5 retaining the team to comply regulatory flexibility for
6 2017 through 2025 model years as an alternative to our own
7 standards.
8 Staff will also present the results of our
9 studies to address the Board's questions on the
10 feasibility of the one milligram per mile particulate
11 matter standard for light-duty vehicles and the
12 appropriateness of a current zero-emission vehicle
13 requirements.
14 Pippin Mader of the Monitoring and Laboratory
15 Division will now start the staff's presentation, followed
16 by Anna Wong of the Emissions Compliance Automotive
17 Regulations and Science Division.
18 And with that, Pippin.
19 (Thereupon an overhead presentation was
20 Presented as follows.)
21 AIR RESOURCES ENGINEER MADER: Thank you,
22 Mr. Corey. Good morning, Chair Nichols and members of the
23 Board.
24 Today I'll provide summary of our conclusions
25 from the midterm review of California's Advanced Clean Car

1 program.
2 --o0o--
3 AIR RESOURCES ENGINEER MADER: First, let me
4 start off with a refresher on the Advanced Clean Car
5 program. In 2012, the Board adopted a comprehensive set
6 of regulations for light-duty vehicles as an integrated
7 package laying out emissions standards through the 2025
8 model year. As shown in the pie chart, there are three
9 distinct elements that make up the program. The first two
10 are part of a Low Emissions Vehicle or LEV program. The
11 LEV criteria program provides standards for pollutants
12 such as hydrocarbons, oxides of nitrogen, and particulate
13 matter. While the LEV greenhouse gas, or GHG, program
14 provides standards for pollutants such as carbon dioxide
15 and methane. As adopted, these two elements will yield a
16 projected 75 percent reduction in criteria pollutants, a
17 90 percent reduction in the PM standard, and a 34 percent
18 reduction in greenhouse gas emissions by 2025.
19 The third key element of the program is our
20 zero-emissions vehicle, or ZEV, program. The ZEV mandate
21 is a technology-forcing program that requires vehicle
22 manufacturers to produce an increasing number of ZEVs
23 including battery, fuel cell, and plug-in hybrid electric
24 vehicles in a 2018 through 2025 model years.
25 --o0o--

1 AIR RESOURCES ENGINEER MADER: Even with the
2 significant climate change and air quality challenges. On
3 top of the timeline, we have identified the nearer-term
4 climate goals. Equally important, on the bottom we have
5 identified near-term air quality standards for particulate
6 matter, or PM, and ozone. The adopted LEV III program
7 represents our third generation of light-duty vehicle
8 standards. These fleet-wide emissions reductions are
9 needed in the light-duty transportation sector to help
10 attainment for both the 2023 and 2031 air quality
11 requirements as well as a 2020 and 2030 greenhouse gas
12 targets.
13 The ZEV requirement continues promoting the
14 development of advanced technology that is needed to put
15 us on the path to electrifying the fleet in order to meet
16 longer-term goals.
17 --o0o--
18 AIR RESOURCES ENGINEER MADER: With that
19 background, let's move into midterm review. When adopted
20 in 2012, the Board noted a number of specific areas that
21 they wanted staff to investigate and report back on as we
22 got closer to implementation. Taking these one by one:
23 With respect to greenhouse gas, the Board committed
24 staff to working with our federal agency partners to
25 reevaluate the appropriateness of the 2022 through 2025

1 model year greenhouse gas standards. This is the midterm
2 review we have been hearing so much about these days.
3 For criteria pollutant standards, there were a
4 couple of areas regarding the one milligram per mile PM
5 standard. Specifically, industry voiced concern at the
6 time regarding the accuracy of measurement equipment at
7 those very low levels and several Board members asked us
8 to track technology development to confirm that the
9 standards were both technically feasible and appropriate
10 to begin phasing in for the 2025 model year.
11 And for the ZEV Program, the Board asked staff to
12 track the progress of technology and industry to evaluate
13 if the approp -- adopted requirements out to 2025 remained
14 appropriate for both California and the nine Section 177
15 states that have also adopted our requirements.
16 Given the newness of the plug-in hybrid electric
17 vehicle, or PHEV, technology in 2012, the Board also asked
18 staff to study the development and usage of PHEVs to
19 reevaluate whether they were treated appropriately within
20 the regulation.
21 --o0o--
22 AIR RESOURCES ENGINEER MADER: Before we go
23 farther, I'd like to take a moment to help clarify some of
24 the interactions between our midterm review and a parallel
25 review that our federal partners, U.S. EPA and the

1 National Highway Traffic Safety Administration, or NHTSA.
2 Two of the elements in the advanced clean car
3 review, the criteria pollutant standards and the ZEV
4 Program, are California specific requirements and
5 therefore only part of ARB's midterm review.
6 However, both California and the federal program
7 review overlapped in the assessment of the greenhouse gas
8 standards. I'll elaborate in the next few slides how
9 U.S. EPA, NHTSA, and CARB collaboratively conducted an
10 assessment of the greenhouse gas standards as part of a
11 national program.
12 --o0o--
13 AIR RESOURCES ENGINEER MADER: Starting in 2012,
14 we adopted the Advanced Clean Cars program and later that
15 year the federal greenhouse gas standards were adopted.
16 As part of an agreement to promote a single national
17 program for greenhouse gas standards, California amended
18 its regulation in late 2012 to include a provision known
19 as "deemed to comply," allowing manufacturers to comply
20 with the national standards in lieu of the
21 California-specific standards. This agreement was
22 premised on strong national standards.
23 Over the last four years, extensive work has been
24 done by CARB, EPA, and NHTSA including internal and
25 external research, surveys and analysis of vehicle owners,

1 and laboratory testing to inform the review of the
2 national standards.
3 In July of last year, the first key milestone in
4 the federal review occurred with the release of the
5 Technical Assessment Report, or TAR, jointly authored by
6 CARB and its federal partners. Later that year, CARB
7 hosted a technical symposium that covered emerging
8 technologies not included in the TAR but being pursued by
9 vehicle manufacturers for near-term implementation.
10 Finally, this year we released our midterm review
11 report in preparation for today's hearing. A final
12 determination was also issued by the EPA earlier this year
13 that concluded EPA's national greenhouse gas standards for
14 2022 through 2025 model years were appropriate and would
15 remain as currently adopted.
16 However, just last week the new federal
17 administration announced that they will be reconsidering
18 that final determination over the course of the next year.
19 We do not believe that reconsideration is warranted given
20 the completeness of the review that has already occurred.
21 --o0o--
22 AIR RESOURCES ENGINEER MADER: Okay. Let's
23 quickly review our greenhouse gas standards.
24 ARB established the first vehicle greenhouse gas
25 standards in the nation beginning with the 2009 model

1 year. Subsequently, U.S. EPA also set standards for 2012
2 through 2016 that closely aligned with California's
3 standards and paved the way for the first national
4 program.
5 Then in the 2012 time frame, CARB and EPA
6 separately set comparable greenhouse gas standards out to
7 2025 and again provided for a continuation of the national
8 program. However, given the latter years of the standard
9 were still 10 years away, CARB and the federal agencies
10 agreed to conduct a midterm evaluation focused only on the
11 reassessment of the appropriateness of the 2022 through
12 2025 standards.
13 --o0o--
14 AIR RESOURCES ENGINEER MADER: So what have we
15 learned? First let's take a look at how manufacturers are
16 complying with the current standards.
17 The yellow diamonds on the graph represent the
18 greenhouse gas standards for the nationwide fleet for the
19 last four years and, for reference, also show what the
20 standards would be if they were specific to the California
21 fleet. Since the California fleet of new vehicles sold
22 each year includes a higher fraction of cars than the
23 nationwide fleet, the standards for California is lower
24 than for the federal fleet. And of course, you can see
25 that the standards get progressively lower each year.

--o0o--

AIR RESOURCES ENGINEER MADER: If we now look at the bars on the chart, we can see what emission levels the actual fleet was certified to in each of the last four years. Vehicle manufacturers have been overcomplying with the federal standards for each of the last four years. For comparison, you can see that the California fleet, which includes a higher fraction of zero-emission vehicles, is generally overcomplying by an even larger margin. Also noteworthy is that this overcompliance generates credits for the vehicle manufacturers, which they can then bank and use in future years to help meet standards.

--o0o--

AIR RESOURCES ENGINEER MADER: So why are the vehicles able to overcomply? Because manufacturers and suppliers have been quite busy. Technology to reduce greenhouse gas emissions has been evolving rapidly and manufacturers have been able to roll out the new technology at a significant pace. Much of the gains observed so far are from improved engines and transmissions, like smaller turbocharged engines and redesigned multi-gear automatic transmissions.

However, there are several other key technologies that have been helping, including vehicle light-weighting,

1 improved aerodynamics, and lower rolling resistance tires.
2 Together, these reduce the amount of energy needed to move
3 the vehicle.
4 And other technologies are just now entering the
5 market in large shares like stop-start systems that
6 temporarily turn the engine off when a vehicle is at idle.
7 All told, over 20 percent of new vehicles sold in
8 2016 model year already meet the 2020 model year
9 standards - a full four to five years ahead of the curve.
10 --o0o--
11 AIR RESOURCES ENGINEER MADER: So what more is it
12 going to take to get out to 2025? Predominantly,
13 incremental improvements to conventional technologies.
14 The pie chart here shows the composition of the
15 projected vehicle fleet that would be needed in 2025 to
16 meet the standards. From the extensive testing and
17 modeling analysis for the midterm evaluation, gasoline
18 engines are predominant, with nearly 95 percent of the
19 fleet primarily utilizing advanced technology engines. Of
20 note, only a small portion of the fleet would need to be
21 electrified.
22 Regarding costs, the most recent analysis for
23 EPA's proposed determination shows that the cost to comply
24 is $300 lower than originally projected in 2012.
25 --o0o--

1 AIR RESOURCES ENGINEER MADER: So what does this
2 all mean in California?
3 Back in 2012, we projected the average fleet out
4 to 2025 model year, shown as the black line on the graph,
5 culminating in a value of 167 grams per mile in 2025.
6 Since that time, we have four additional years of data on
7 the exact mix of cars and trucks being sold. We have also
8 seen gasoline prices fall dramatically and shift in
9 consumer purchases away from car models and into small
10 SUVs. Taking all this into account, we have updated our
11 projections of the future fleet, including analyzing a few
12 different sensitivity cases regarding future fuel prices
13 and the types of vehicles being sold. The green-shaded
14 area represents what these new analyses project for
15 California and, as you can, even with the slight shift in
16 sales mix that is occurring, California is still on track
17 for the same or better greenhouse gas reductions by 2025.
18 --o0o--
19 AIR RESOURCES ENGINEER MADER: During the midterm
20 review, the vehicle manufacturers raised concerns with the
21 analysis and conclusions. Primarily the manufacturers
22 have indicated they believe that the analysis
23 overestimates the efficiency of some of the technologies
24 and thus underestimates the total amount of technology
25 that will be needed. The rationale continues that adding

more advanced technology, specifically strong electrification like full hybrids, will mean higher costs to comply than projected. And, they argue, consumer acceptance and demand for fuel efficient vehicles, especially strong electrification, is inadequate to enable them to meet the standards.

Staff, however, disagrees. The data underpinning our analysis is exhaustive and well grounded in testing of actual engines sand transmissions and supports that the standards can be met without the higher levels of technology industry is suggesting. Alternative scenarios show that there are several cost-competitive gasoline technologies available to meet the standards. These analyses do not even include some promising technologies that manufacturers have already announced for the near future. Lastly, electrified vehicle sales in California are already at levels near what the projected as needed by 2025 and prospective buyers have expressed interest in zero-emissions vehicles at even higher levels than that.

Which leads us to our recommendation for the greenhouse gas standards.

--o0o--

AIR RESOURCES ENGINEER MADER: Based on the extensive analysis done with our federal partners over the last four years, the data supports the conclusion that the

1 2022 through 2025 model year federal standards are
2 appropriate as currently adopted. Accordingly, staff
3 recommends continued participation in a national program
4 through 2025, provided no further changes weaken the
5 expected benefits in California.
6 --o0o--
7 AIR RESOURCES ENGINEER MADER: Today's
8 presentation concludes California's midterm review of the
9 2022 through 2025 greenhouse gas standards. The U.S.
10 EPA's review has also been concluded, after an extensive
11 public process, and drew complementary conclusions
12 consistent with the data. U.S. EPA is reopening that
13 process. Staff believes the evidence and the law do not
14 support this action.
15 Should that federal process nonetheless continue,
16 CARB will continue to vigorously advocate for continuing
17 greenhouse gas reductions as the evidence indicates is
18 appropriate.
19 Should the federal standards not follow the best
20 available evidence, staff will have to revisit our
21 recommendation regarding the one national program in light
22 of any changes.
23 Also of note is that Canada is performing an
24 independent review of greenhouse gas standards that are
25 closely aligned with the currently adopted federal

1 standards. We are engaging in technical dialogue directly
2 with Canada as their decision will have a significant
3 bearing going forward.
4 Additionally, staff will continue to monitor
5 global activities in this area.
6 --o0o--
7 AIR RESOURCES ENGINEER MADER: Before we leave
8 our discussion of the greenhouse gas standards, I would
9 like to point out that the shift from cars to small SUV
10 sales does have a large impact nationally. Specifically,
11 the national fleet was originally projected to be at 163
12 grams per mile by 2025 model year. But the updated
13 analysis suggests it will be closer to 175 grams per mile
14 due to the larger fraction of truck sales.
15 While staff's recommendation is to keep the
16 greenhouse gas standards as currently adopted, a
17 sensitivity analysis found it would add significant cost
18 to recapture the original projected reductions on a
19 national level.
20 This concludes the greenhouse gas portion of the
21 midterm review.
22 --o0o--
23 AIR RESOURCES ENGINEER MADER: Now I'll move on
24 to particulate matter, or PM, portion of the review.
25 Under the previous standards the PM limit was 10

1 milligrams per mile even though most gasoline vehicles
2 actually emitted below 1 milligram per mile. However,
3 some new technologies, most notably direct fuel injection
4 systems, were starting to show up with significantly
5 higher PM emissions.
6 To avoid backtracking, the LEV III standards
7 established both an interim PM standard at 3 milligrams
8 per mile and a final standard at 1 milligram per mile.
9 As shown by the bars on the graph, both standards
10 phase in over multiple years with vehicles beginning just
11 now to certify to the 3 milligram per mile standard, while
12 the 1 milligram per mile standard starts to take effect
13 with the 2025 model year.
14 In 2012, the Board directed staff to re-examine
15 the measurement methods to confirm they were able to
16 measure at the 1 milligram level.
17 And the Board also asked staff to re-examine the
18 stringency and phase-in timing of the 1 milligram per mile
19 standard.
20 --o0o--
21 AIR RESOURCES ENGINEER MADER: In responding to
22 the measurement question, staff conducted extensive
23 emissions testing and research of laboratory methods and
24 alternative measurement methods. The results of that
25 investigation, which included several peer-reviewed

1 publications, were presented to the Board in October 2015.
2 And while the investigation included a look at many
3 alternative methods such as particulate number counts and
4 cutting-edge real-time measurements, our conclusions were
5 that the current gravimetric method for measuring PM
6 emissions is sufficiently accurate and continues to be
7 appropriate for the future.
8 --o0o--
9 AIR RESOURCES ENGINEER MADER: Next was
10 evaluating the feasibility and implementation of the 2025
11 PM standards. Part of the original concern was that the
12 engine technologies needed for stringent greenhouse gas
13 emissions standards would have difficulty with PM
14 emissions control. Accordingly our testing focused on
15 recently redesigned vehicles with advanced greenhouse gas
16 control technologies similar to what is expected as
17 greenhouse gas standards decline.
18 The vehicles tested are shown across the bottom
19 of the chart and include vehicles with newer fuel
20 injection, hybrid, and plug-in hybrid electric vehicles.
21 While most of these vehicles are not yet
22 certifying to a 3 milligram per mile standard, you can see
23 from the chart that many are already emitting at a level
24 that is at half the standard.
25 However, when looking at the future 1 milligram

per mile standard, only a subset of the vehicles currently comply. Most vehicles will likely go through another engine redesign cycle to implement the further refinements needed to comply with the 2025 standard. So let's talk about the type of refinements that are needed.

--o0o--

AIR RESOURCES ENGINEER MADER: Good PM control requires tight control of air and fuel during all operational modes of the engine. The most important aspect is control within the combustion chamber itself. Our testing and research found that manufacturers and suppliers are rapidly learning in this area. But the process takes time to optimize and it must be done in conjunction with greenhouse-gas-related engine updates to ensure complete control for all emissions.

While we expect manufacturers will likely meet the PM standards with optimized designs and in-cylinder control, there are also after-treatment technologies that can be used to control PM emissions.

--o0o--

AIR RESOURCES ENGINEER MADER: Gasoline particulate filters, or GPFs, can be used to filter and continuously oxidize particles that are emitted from the engine. The photo on the side shows a prototype GPF tested by CARB on two higher emitting vehicles. The

1 results in the bar chart show PM emissions of over 5
2 milligrams per mile before installation, and levels below
3 1 milligram per mile with the system installed.
4 GPFs can effectively control PM, but they also
5 represent added hardware and expense. GPFs are not yet in
6 wide-scale production, but they are expected to be widely
7 used in Europe. From staff's analysis, GPF technology may
8 be best used for added flexibility to vehicle
9 manufacturers when they design for compliance.
10 --o0o--
11 AIR RESOURCES ENGINEER MADER: In our
12 investigation, we observed that the effectiveness of PM
13 control can vary during different types of driving. The
14 blue bars show the results from our testing for the
15 vehicles that already emit less than 1.5 milligrams per
16 mile on the standard emissions test cycle.
17 The yellow bars show results from the same
18 vehicles when driven on a more aggressive test cycle. As
19 you can see, most of these vehicles have similar emissions
20 results across the two cycles and are still below 1.5
21 milligrams per mile, indicating robust PM control.
22 However, there are some test results that show
23 significantly higher PM emissions under more aggressive
24 driving conditions.
25 --o0o--

1 AIR RESOURCES ENGINEER MADER: In conclusion,
2 staff has determined that the 1 milligram per mile PM
3 standard is feasible and therefore recommends no change to
4 the standard or the phase in said you'll.
5 However, CARB plans further study and may
6 consider future regulatory proposals to ensure good PM
7 control in all real-world driving conditions.
8 --o0o--
9 AIR RESOURCES ENGINEER MADER: For the third
10 piece of our review I would like to turn the presentation
11 over to my co-worker, Ms. Anna Wong, to summarize the
12 findings of our review of the zero-emissions vehicle
13 requirements.
14 --o0o--
15 STAFF AIR POLLUTION SPECIALIST WONG: Good
16 morning, Chair Nichols and members of the Board.
17 For the next section of the presentation, I will
18 focus on the zero-emission vehicle, or ZEV, regulation.
19 Prior to the Board adopting the Advanced Clean Cars
20 amendments in 2012, the ZEV regulation essentially
21 flat-lined the requirements past the 2018 model year. In
22 2012, the Board adopted annual increasing requirements
23 through 2025 model year that were projected at that time
24 to result in 15 percent of 2025 model year new car sales
25 in California to be ZEVs and plug-in hybrids. After this

1 historic increase in ZEV requirements, the Board asked
2 staff to ensure those requirements would still be
3 appropriate leading up to the 2018 model year
4 implementation, both in California and the other states
5 that have adopted California's regulations, often referred
6 to as the Section 177 ZEV states.
7 Lastly, when the Advanced Clean Cars program was
8 adopted, a new type of vehicle was emerging with the
9 release of the Chevrolet Volt plug-in hybrid. Since
10 plug-in hybrids were projected to play a significant role
11 in most manufacturer's compliance through 2025, the Board
12 wanted staff to review this new technology.
13 --o0o--
14 STAFF AIR POLLUTION SPECIALIST WONG: In 2011, as
15 the staff report for the Advanced Clean Cars rulemaking
16 was being released, just two models were available and
17 accounted for less than 10,000 new sales. Through the end
18 of calendar year 2016, nearly 300,000 ZEVs and plug-in
19 hybrids have been registered in California and in the
20 Section 177 ZEV states with nearly 30 different models on
21 the market.
22 --o0o--
23 STAFF AIR POLLUTION SPECIALIST WONG: What has
24 this meant for regulatory compliance? Shown in the blue
25 shaded area on the screen is the total number of ZEV

1 credits required for the 2012 through 2017 time frame,
2 with the California requirements on the left and the
3 Section 177 ZEV states on the right.
4 The growth in new sales of plug-in hybrids and
5 ZEVs has resulted in an overproduction of regulatory
6 credits, making most manufacturers overcompliant with the
7 current ZEV requirements, shown by the dark blue line.
8 --o0o--
9 STAFF AIR POLLUTION SPECIALIST WONG: Now, let's
10 combine the California and Section 177 ZEV state
11 requirements and look toward the latter years of the
12 program.
13 While the auto manufacturers have been building a
14 healthy credit bank by delivering ZEVs and plug-in
15 hybrids, it's important to remember future requirements
16 will be even more stringent. The future credit
17 requirement is not just larger, but the previously
18 approved amendments also reduce the number of credits
19 earned for each vehicle produced. As an example, this
20 star here represents the credits earned for the total
21 number of ZEVs and plug-in hybrids sold in model year
22 2015. If manufactures sold the identical number and type
23 of vehicles in model year 2018, they would only earn about
24 one-third of the credits, the second star. So the same
25 volume of vehicles results in overcompliance in earlier

1 years and undercompliance in later years.
2 Let's take a minute to look at how these 2018
3 through 2025 requirements translate into the number of
4 vehicles we can expect from the regulation.
5 --o0o--
6 STAFF AIR POLLUTION SPECIALIST WONG: As
7 previously mentioned, In 2012 the project compliance
8 scenario for the new increased ZEV regulation was to
9 result in roughly 4 million ZEVs and plug-in hybrids
10 cumulatively by 2025 model year. Over the course of this
11 review, updated compliance scenarios reflect vehicle
12 technology advancements evident in the market, and
13 compliance with the regulation will now result in roughly
14 2 million vehicles cumulatively over the 2018 through 2025
15 time frame. For reference, this is about 8 percent of new
16 vehicle sales in 2025 model year. Staff also integrated
17 various regulatory flexibilities adopted by the Board, as
18 well as banked ZEV credits as shown on previous slides.
19 --o0o--
20 STAFF AIR POLLUTION SPECIALIST WONG: The
21 transformation of the light-duty fleet has begun, and a
22 growing number of manufacturers appear committed to
23 long-term electrification. Manufacturers are competing
24 with each other for PEV consumers by continually refining
25 the products they offer to suit consumer preferences.

1 Outside of California, ZEV markets are expanding in the
2 U.S. as well as globally, indicating that the industry is
3 gaining momentum.
4 --o0o--
5 STAFF AIR POLLUTION SPECIALIST WONG: This shift
6 has been enabled by technology costs continuing to come
7 down. Both fuel cell systems and battery costs have
8 fallen dramatically from to 2006 to 2015, with fuel cell
9 systems dropping nearly 60 percent and batteries over 70
10 percent. Costs for both technologies are expected to
11 continue to drop as volumes increase and the technology
12 improves. Staff anticipates that battery electric or fuel
13 cell technology will not reach cost parity with
14 conventional gasoline technology until sometime after
15 2025.
16 --o0o--
17 STAFF AIR POLLUTION SPECIALIST WONG: Falling
18 technology costs will facilitate an increasing vehicle
19 range in future models, which will help to sustain and
20 expand the ZEV market. Automakers acknowledge that
21 vehicle range can be a significant barrier to consumer
22 acceptance of these new vehicle technologies. As shown,
23 even among current plug-in electric vehicle drivers,
24 dissatisfaction with all-electric range declines as
25 vehicle range increases. Fortunately, trends in new ZEV

1 offerings are aligning with those consumer preferences.
2 --o0o--
3 STAFF AIR POLLUTION SPECIALIST WONG: This chart
4 shows the number of vehicle models offered in various
5 vehicle size and all-electric range combinations. In
6 model year 2011, the orange icon represents one plug-in
7 hybrid offered in the small car category with an
8 all-electric range of 30 to 40 miles. And the two blue
9 icons represent all-battery electric models, both with a
10 range of less than 100 miles.
11 In model year 2012 additional vehicles were
12 introduced, and the larger icon represents more
13 battery-electric vehicle models offered in the small car
14 category. While the market began in smaller vehicle
15 platforms where costs are lower, over time auto
16 manufacturers have continued to release new models. So
17 that today's market has expanded into more vehicle
18 segments with longer ranges.
19 Within the next five model years we expect over
20 70 models that will provide consumers with more choices
21 aligned with their purchase references. Larger battery
22 packs on vehicles also could help offset cold weather
23 losses and help expand choices in different markets
24 outside California.
25 These bars highlight the market share of new

1 vehicles sold within each of the vehicle classes. As you
2 can see, the small SUV and midsize car segments are the
3 two most popular classes, which are also where many of the
4 future new models are expected to be offered, many with
5 extended vehicle ranges beyond today's offerings. This
6 broadening of the ZEV technology across the most popular
7 platforms shows promise not only for California but also
8 for the Section 177 ZEV states.
9 --o0o--
10 STAFF AIR POLLUTION SPECIALIST WONG: Nine states
11 have adopted California's ZEV regulation. Sales of ZEVs
12 and plug-in hybrids in the Section 177 states still do lag
13 behind California's market. And the Board, anticipating
14 this jump in the requirement, adopted appropriate
15 flexibilities to help ease the regulatory burden.
16 In 2012, the Board extended the "travel"
17 provision for battery electric vehicles through 2017 model
18 year, a change which has in turn created healthy credit
19 banks for manufacturers heading into more stringent 2018
20 and subsequent model year requirements.
21 The Board also adopted an optional compliance
22 path as an important flexibility provision, which, if
23 taken, requires manufacturers to deliver battery electric
24 vehicles prior to 2018 model year in the Section 177
25 states. This optional compliance path also reduces

1 automaker requirements in the Section 177 states for
2 battery electric vehicles and plug-in hybrids through
3 2020; and allowed manufacturers to pool their credits
4 amongst the Section 177 states for BEVs and plug-in
5 hybrids to further reduce state-specific burdens.
6 --o0o--
7 STAFF AIR POLLUTION SPECIALIST WONG: In 2012,
8 the Board adopt policies that require intermediate volume
9 manufacturers, or IVMs, to begin electrifying their fleets
10 starting in 2018. These policies redefined many of the
11 midsized manufacturers as large volume manufacturers and
12 allowed the remaining IVMs to meet their 2018 through 2025
13 model year requirements exclusively with plug-in hybrids.
14 In addition to some flexibilities that were afforded to
15 the IVMs in 2012, the Board adopted additional
16 flexibilities in 2014, ensuring these manufacturers would
17 remain defined as this smaller category IVMs through 2025
18 model year and granted more time to comply with their ZEV
19 requirements.
20 Since the 2012 and 2014 rulemakings,
21 manufacturers confirmed various plans for full compliance
22 with the regulation as adopted and are pursuing both
23 plug-in hybrid and ZEV models, some recognizing it will be
24 almost impossible to meet their obligation exclusively
25 with plug-in hybrids. At the 2016 L.A. Auto Show, CEO of

1 Fuji Heavy Industries, which produces Subaru vehicles,
2 indicated these intentions towards electrification.
3 --o0o--
4 STAFF AIR POLLUTION SPECIALIST WONG: While staff
5 is recommending to maintain the current ZEV requirements
6 to provide regulatory stability, because important
7 provisions are sunsetting at the same -- in the same time
8 frame. In the greenhouse gas program, two provisions
9 intended to support ZEVs are also scheduled to expire by
10 2025. Additionally, carpool lane access for ZEVs, funding
11 for hydrogen infrastructure, and federal tax credits for
12 plug-in vehicles will likely all expire before cost parity
13 of ZEVs with conventional gasoline technology is expected.
14 Staff will continue to monitor market trends so we can
15 bring the Board appropriate recommendations to continued
16 to support ZEVs through regulatory and nonregulatory
17 actions.
18 --o0o--
19 STAFF AIR POLLUTION SPECIALIST WONG: In 2012,
20 the Board strengthened the ZEV regulation, nearly tripling
21 the requirement for pure ZEVs in 2025 model year, and
22 shifting to a simpler annual increase in requirements.
23 Since then, the regulation is accelerating development of
24 ZEV technology toward commercialization, demonstrated by
25 the clear growth in the ZEV market, and over 70 unique ZEV

1 and plug-in hybrid models expected in the next five model
2 years.
3 Despite these successes, it is widely recognized
4 that the ZEV and plug-in hybrid market is still in the
5 early stages of its development. Given the remaining and
6 still significant barriers regulatory stability of the
7 2018 through 2025 model year standards can help ensure a
8 continued path of increasing but achievable ZEV volumes.
9 Therefore, staff is recommending to maintain the current
10 ZEV requirements, as adopted in 2012, in California, the
11 Section 177 states, and for intermediate volume
12 manufacturers.
13 --o0o--
14 STAFF AIR POLLUTION SPECIALIST WONG: When the
15 strengthened ZEV regulation was adopted in 2012, it
16 included a new focus on plug-in hybrids. In fact, we
17 expect over two-thirds of the vehicles resulting from
18 compliance with the regulation to be plug-in hybrids.
19 Little was known at the time about how these
20 types of vehicles were being driven, and their actual
21 environmental benefits, because there were so few
22 available to consumers in 2012. When these amendments
23 were approved, the Board directed staff to study in-use
24 data for plug-in hybrids, such as how they're driven and
25 charged, in addition to criteria pollutant and GHG

1 emissions.
2 In the time since the Board direction, eight
3 manufacturers have provided in-use data on 11 different
4 plug-in models and over 90,000 unique vehicles. That
5 in-use trip-level data represents over 20 million miles of
6 use by those vehicles.
7 --o0o--
8 STAFF AIR POLLUTION SPECIALIST WONG: We
9 calculated electric vehicle miles traveled, or eVMT. eVMT
10 represents the vehicle's miles driven on electric power.
11 The green bars show the annualized eVMT for each of the
12 models, while the yellow hatched bars represent the
13 portion of a plug-in hybrid's miles that are powered by
14 its internal combustion engine. Focusing in on annualized
15 eVMT, plug-in hybrids have less eVMT than battery electric
16 vehicles. Now, when I overlay this red line, which shows
17 how many credits each vehicle receives in the ZEV
18 regulation, based on the vehicle's electric range, you can
19 see that relationally the eVMT of the vehicles and the
20 relative amount of credit lines up pretty well.
21 --o0o--
22 STAFF AIR POLLUTION SPECIALIST WONG: In order to
23 analyze the criteria pollutants, emissions testing was
24 done at a Haagen-Smit laboratory. The focus was on
25 examining start emissions from so-called blended plug-in

1 hybrids - hybrids that are pure electric at low vehicle
2 speeds but blend a mix of gasoline engine and electric
3 power at higher speeds and accelerations. The first bars
4 on the graph indicate the start emissions from three
5 different plug-in hybrids during the normal emissions test
6 cycle, and all of them readily met our existing standards.
7 Next, staff drove one of the vehicles on-road to
8 determine the types of driving maneuvers that caused the
9 engines to first start and then recreated those events
10 back in the laboratory. Under these other types of
11 driving conditions, start emissions were found to be about
12 2 to 5 times higher. For future plug-in hybrids, further
13 refinements and vehicle design changes are needed to
14 minimize emissions in real-world driving conditions.
15 --o0o--
16 STAFF AIR POLLUTION SPECIALIST WONG: Emissions
17 will depend on how these vehicles are charged. By design,
18 plug-in hybrids are intended to be flexible, which means
19 it is up to their drivers to charge or not. While most
20 consumers are satisfied with their plug-in hybrids, an
21 analysis of trip data shows many drivers do charge
22 routinely. These two comments from current plug-in hybrid
23 drivers highlight how charging behavior can vary based on
24 purchase motivation, vehicles battery capacity,
25 infrastructure availability, and energy prices. How these

1 factors change in the future will matter for how we
2 determine the new GHG clean air benefits of plug-in
3 hybrids.
4 --o0o--
5 STAFF AIR POLLUTION SPECIALIST WONG:
6 Specifically, we examined various scenarios
7 across a broad range of eVMT assumptions and found GHG
8 emissions to be highly variable, increasing the light-duty
9 vehicle fleet's GHG contribution up to 60 percent with
10 high plug-in hybrid penetrations in the fleet. Although
11 not shown here, NOx emissions follow a similar trend.
12 This is due to the highly user-dependent nature of plug-in
13 hybrids. If, say, charging infrastructure is not
14 available for a plug-in hybrid user to maximize their
15 eVMT, the GHG benefit of their vehicle will decrease.
16 --o0o--
17 STAFF AIR POLLUTION SPECIALIST WONG: Therefore,
18 based on the analysis I described, staff has concluded
19 that the regulation as adopted in 2012 appropriately
20 credits plug-in hybrids and allows for manufacturers to
21 comply with this technology through 2025 model year, as
22 staff expects over two-thirds of vehicles to be plug-in
23 hybrids cumulative according to its latest compliance
24 scenarios.
25 Plug-in hybrids will still play a significant

1 role in transforming the light-duty sector, but at this
2 time, no additional regulatory credit is needed.
3 --o0o--
4 STAFF AIR POLLUTION SPECIALIST WONG: Let's take
5 a minute to review the comments we received since
6 releasing our midterm review report. One issue brought up
7 by dealers in the northeast and Oregon was a concern over
8 a provision removed during the 2012 amendments that gives
9 additional credits for vehicles that are "placed in
10 service."
11 In 2018 and beyond, battery electric vehicles
12 will earn credits upon delivery for sale, meaning when
13 dealers take delivery of the vehicles on to their lots.
14 Dealers are concerned that their lots will be inundated
15 with ZEVs and plug-in hybrids, and manufacturers will not
16 help support the sale of these vehicles. Thus plan staff
17 to monitor this issue and consider regulatory changes as
18 appropriate.
19 The Board also received comments from the auto
20 industry which were in line with those received during the
21 midterm review process, asking for more plug-in hybrids
22 allowed to meet their requirement, reduction in the
23 requirements for the Section 177 states, and greater
24 support for complementary policies.
25 --o0o--

1 STAFF AIR POLLUTION SPECIALIST WONG: During the
2 course of the review several stakeholders and Board
3 members asked staff to consider various options to the ZEV
4 requirements before the 2025 time frame. Here are three
5 options that could be investigated for the 2022 through
6 2025 model year.
7 One, increasing the stringency of the regulation
8 with a specific focus on pure ZEVs.
9 Two, would be to require a greater all-electric
10 functionality to qualify as a plug-in hybrid.
11 And, lastly, restrictions on the use of purchased
12 or banked ZEV credits such as having credits expire,
13 depreciate with time, or be restricted in what portion of
14 the annual obligation that could be satisfied with
15 credits.
16 However, full consideration of these options have
17 not been vetted through the process and are not
18 recommended for these years.
19 --o0o--
20 STAFF AIR POLLUTION SPECIALIST WONG: Our
21 recommendation to stay the course achieves a balance
22 because there are still significant barriers to increasing
23 ZEV sales. The 2016 California ZEV Action Plan summarizes
24 an extensive list of complementary policies. In addition,
25 some new measures are launching to address two of the more

1 significant barriers: A lack of consumer awareness and
2 insufficient public fueling infrastructure.
3 New and expansive consumer campaigns are
4 beginning to take shape in California and nationally.
5 This includes efforts by the PEV Collaborative and its
6 Veloz initiative, NESCAUM'S effort to select -- effort to
7 select markets nationally, and Volkswagen's investment in
8 campaigns as part of the diesel settlement's ZEV
9 Investment Plan that you will be hearing in the next item.
10 In the area of fueling infrastructure, the
11 passage of Senate Bill 350 in 2015 created a new
12 transportation electrification priority for electric
13 utilities, allowing them to make large investments in
14 charging infrastructure and other PEV services,
15 anticipated to be several billion dollars by 2030.
16 Additionally, CARB is reviewing the first Volkswagen ZEV
17 investment plan that proposes a large public charging
18 infrastructure network. Finally, for hydrogen
19 infrastructure the Energy Commission has proposed new
20 station grants that include major energy companies
21 reentering the hydrogen business.
22 Addressing all these challenges with
23 complementary policies are essential to ensuring market
24 success for these vehicles.
25 --o0o--

1 STAFF AIR POLLUTION SPECIALIST WONG: We will now
2 conclude with what we think should be our next steps.
3 Following this midterm review, we need to look at the road
4 ahead, carefully studying how the transportation sector is
5 changing, and consider what new policies and regulations
6 California needs in 2026 and beyond.
7 --o0o--
8 STAFF AIR POLLUTION SPECIALIST WONG: As we begin
9 the development of new regulations, we need to understand
10 the gap in projected emissions from our current programs
11 relative to the state's targets.
12 The graph on the left represents total NOx
13 emissions in the South Coast Air Basin where over 85
14 percent arise from transportation sectors today. The
15 emission levels to reach attainment for 2031 are clearly
16 shown on the bottom. And the graph on the right
17 represents statewide GHG emissions for on-road cars and
18 trucks. Current programs provide important reductions,
19 but the gap is sill significant when the SB 322030
20 requirements are taken into account, as well as the
21 Executive Order 2050 targets.
22 It is clear, additional light-duty vehicle
23 programs will be needed to provide further reductions in
24 both criteria and greenhouse gas emissions.
25 --o0o--

1 STAFF AIR POLLUTION SPECIALIST WONG: To assess
2 how to fill this gap, the Mobile Source Strategy describes
3 updated scenarios showing actions that can help the state
4 meet our emissions targets.
5 This graphic shows a potential technology rollout
6 for the light-duty vehicle fleet that would put us on a
7 path to achieving the greenhouse gas, air quality, and
8 petroleum reduction goals. In this scenario, electric
9 vehicles move well beyond the current ZEV regulation,
10 scaling up to 100 percent of all new vehicle sales by
11 2050, with 4.3 million ZEVs and plug-in hybrids on the
12 road by 2030. Though this scenario is only a top-down
13 analysis, it does show that there needs to be a
14 significant shift towards electrification to ensure
15 California's long-term goals are being met.
16 --o0o--
17 STAFF AIR POLLUTION SPECIALIST WONG: In addition
18 to our own analysis and research, staff will carefully
19 evaluate relevant external research and maintaining
20 continued dialogue with stakeholders to help guide the
21 2026 and beyond policy questions. Several recent studies
22 have been released that we are beginning to review, but
23 there will be many more. Although staff have not endorsed
24 or critiqued any of these studies at this point, they are
25 shown here to emphasize how ARB relies on science, data,

1 and stakeholder perspectives in developing our
2 regulations.
3 For example, the American Lung Association study
4 focused on monetizing the public health and climate
5 benefits from a large transformation to electric vehicles
6 in California and the Section 177 states.
7 The Environmental Defense Fund and International
8 Council on Clean Transportation studies both conducted
9 technology and cost feasibility analyses of achieving more
10 greenhouse gas and fuel reduction benefits by 2030. And
11 the Indiana University study conducted a macroeconomic
12 analysis of vehicle standards showing potential positive
13 GDP and job impacts.
14 --o0o--
15 STAFF AIR POLLUTION SPECIALIST WONG: To move
16 forward and achieve the large emissions reductions that
17 are needed from the transportation sector in 2026 and
18 beyond, we must think outside the box in developing new
19 regulations. This slide rep -- this slide presents
20 examples of the kinds of issues we will consider.
21 For example, in the early years of the new
22 program, should fuels be addressed differently in the
23 regulation? The existing ARB GHG fleet regulation
24 includes an upstream emissions factor for ZEVs. Should
25 this be continued? Separately, is it appropriate to grant

ZEV regulation credits for automaker investments in fueling infrastructure?

More broadly, a core question involves the structure of the varying regulations within the Advanced Clean Cars program. Specifically, how should the ZEV regulation change as the fleet emission standards become increasingly more stringent to inherently encourage advanced technology?

Additionally, should the vehicle regulations address the changing transportation sector to include car sharing, ride hailing, and connected-autonomous vehicles? If so, what is the role of the regulation in combination with these other policies?

Finally, in the process for 2026, we believe we can best consider these concerns that the industry and others have highlighted in the context of reopening of the federal midterm review. It's just a question of where to spend our time and resources.

--o0o--

STAFF AIR POLLUTION SPECIALIST WONG: Although we obviously have not determined the exact path we can bring to you for the regulations beyond to 2025, there are some guiding principles that we hope to follow as we prepare a regulatory proposal over the next few years. We need to seek a structure that maximizes the emissions reductions

1 long term but in a cost-effective way, and that encourages
2 innovation by automakers and suppliers. We need to
3 utilize technology forcing requirements but only where
4 needed to address electric vehicle markets and investment
5 barriers. We need to learn from innovative policies being
6 implemented in Europe, Asia, and elsewhere. And we need
7 to follow -- we need to carefully consider a transition
8 from the end of the current program into the new program.
9 We will need to develop new regulations and
10 partnerships with the Section 177 states, NESCAUM, the
11 U.S. EPA, Canada, and others.
12 --o0o--
13 STAFF AIR POLLUTION SPECIALIST WONG: This
14 concludes our California midterm review. And with that,
15 staff asks the Board to concur with the recommendations
16 presented today and described in the proposed resolution.
17 The recommendations are:
18 One, the adopted 2022 through 2025 GHG standards
19 are appropriate and we recommend no change.
20 Two, the adopted one milligram per mile PM
21 standard is feasible but new limits may be needed to
22 ensure low emissions in use.
23 And, three, the current ZEV requirements can be
24 met by the manufacturers and are appropriate to help
25 further market development. Staying the course balances

1 significant process -- progress and remaining barriers.
2 Fourth, the last recommendation requests the
3 Board's concurrence that we begin the process of
4 developing new standards for 2026 model year and beyond
5 and to bring those standards to the Board for
6 consideration as soon as appropriate but no later than the
7 2020 model year.
8 This concludes my presentation.
9 CHAIR NICHOLS: Thank you. We're also joined
10 today by representatives from several of the states that
11 follow California's Advanced Clean Cars Program and that
12 have adopted our program. So I would like to call them
13 forward at this time.
14 We have three, starting with Rob Klee from
15 Connecticut's Department of Energy and Environmental
16 Protection.
17 Commissioner.
18 MR. KLEE: Thank you so much, Chair Nichols and
19 members of the Board. I believe that we're loading up our
20 slide show.
21 (Thereupon an overhead presentation was
22 Presented as follows.)
23 MR. KLEE: Thank you so much for the opportunity
24 to be here this morning.
25 And we can go to the next slide, I think.

--o0o--

MR. KLEE: Connecticut is proud to be among the states that have been implementing the Advanced Clean Cars Program, and I'm pleased to be here with my Section 177 colleagues in strong support of the staff's recommendations.

Connecticut is a long-time leader on climate change. We've been developing and supporting forward-thinking climate-related policies and legislation since the early 2000s. We've been participating in groundbreaking regional initiatives like the Regional Greenhouse Gas initiative, or RGGI, because we know that addressing climate change in a meaningful way presents Connecticut residences and our businesses with the opportunity to create a healthy and sustainable environment, a robust economy, and a high quality of life for current and future generations. Therefore we are forging ahead in all areas to meet our aggressive greenhouse gas reduction goals. But transportation accounts for 37 percent of greenhouse gases in Connecticut and 43 percent across new England. Without the ZEV requirements, we simply would not be able to hit our targets for this sector.

Next slide please.

--o0o--

1 MR. KLEE: The Northeast states have long been
2 leaders in environmental protection, even as our economies
3 have grown over the years. Whether ranked by emissions
4 per capita, total share of CO2 reduced since 1990,
5 statewide efficiency or other measures, it's not a
6 coincidence that the states have opted into this program
7 under Section 177 consistently rank among the very best
8 performers in the nation.
9 This chart as one example shows CO2 emissions per
10 unit of economic output for every state in the U.S., with
11 ZEV Program states highlighted in green. And note that
12 the folks here today did a little better than California.
13 (Laughter.)
14 MR. KLEE: Next slide please.
15 --o0o--
16 MR. KLEE: All of our MOU states have long-term
17 2050 goals that match California's. Many, including
18 Connecticut, are in the process of identifying or refining
19 interim targets as well. We're doing so at the direction
20 of my governor, Governor Dannel P. Malloy, who through the
21 Governors' Council on Climate Change, which I chair and is
22 made up of key state agencies, businesses, academic
23 institutions, and nonprofits, and we've been tasked with
24 setting targets for 2030 and 2040. Next slide.
25 MR. KLEE: Many of our governors signed an MOU in

1 2013 that -- there are eight states. They are California,
2 Connecticut, Massachusetts, Maryland, New York, Oregon,
3 Rhode Island, and Vermont. These governors set a
4 collective target of having 3.3 million ZEVs on our roads
5 by 2025. They further committed to establish a
6 multi-state zero emission vehicle task force to develop
7 and implement a comprehensive ZEV Action Plan designed to
8 achieve our states' electrification goals.
9 The task force released this multi-state ZEV
10 Action Plan in May of 2014 that identifies both the
11 collaborative actions and individual state actions needed
12 to address the full range of barriers to widespread
13 adoption of electric vehicles, such as incentives,
14 infrastructure development, fleets, workplace charging,
15 and consumer education and outreach.
16 Next slide.
17 --o0o--
18 MR. KLEE: At the time our governor signed the
19 eight-state MOU, this matrix that I'm showing you today
20 would have looked much different. Nearly all of the
21 policies shown here have been put in place in the past few
22 years in anticipation of the 2018 ZEV requirements.
23 Please note especially the top two lines.
24 Since the MOU our states have been meeting
25 regularly with Air Resources Board staff and all the

1 automakers in a process we've been calling the New
2 Collaboration for ZEV Success. Early on in those
3 conversations, the automakers identified consumer
4 incentives and infrastructure as the two most important
5 policies to support near-term ZEV deployments. As this
6 chart shows, our states have stepped up and we are ready.
7 And, lastly, I'd like to announce one correction
8 to this chart. That asterisk under New York for consumer
9 vehicle incentives, you can change that to a check mark
10 because Governor Cuomo announced just this past Tuesday a
11 $70 million ZEV incentive rebate program that's up to
12 $2,000 per vehicle in New York.
13 Next slide.
14 --o0o--
15 MR. KLEE: And this is my last one. Just to say,
16 some of the recent highlights that we've been doing in
17 Connecticut to support ZEV's deployment.
18 We've added $3.7 million for funding for our
19 rebate in Connecticut called the Cheaper Program.
20 We've recognized this year and in past years our
21 EVs of the year, and the Chevy Volt was the winner in
22 2016.
23 We also honor our dealerships for their efforts
24 to deploy ZEVs. Stevens Ford in Milford was our winner
25 this year.

1 We provide grants for up to a hundred percent for
2 public charging stations and incentives for others to
3 deploy at workplace chargers. And we've ended range
4 anxiety in Connecticut. You're no further than 20 minutes
5 or 20 miles from a charge anywhere in the state of
6 Connecticut.
7 We have -- our Governor's Council on Climate
8 Change is focused with a laser focus on transportation,
9 looking at vehicle miles traveled. ZEV implementation
10 transit systems at high mileage users. Our comprehensive
11 energy strategy again highlights transportation and is
12 exploring the role the utilities play, taking some
13 learning from the things that have been going on here in
14 California.
15 So with that I'd like to pass the podium to my
16 neighbor to the north, Christine Kirby from Massachusetts.
17 CHAIR NICHOLS: Oh, thanks. We'll hold our
18 questions then till the three of your have all finished
19 your presentations.
20 BOARD MEMBER SHERRIFFS: But just in -- one of
21 the things that you said. It's a goal or everybody is
22 within 20 minutes of a charging station?
23 MR. KLEE: Currently everyone is within 20
24 minutes from a charging station in Connecticut.
25 BOARD MEMBER SHERRIFFS: Congratulations.

1 MR. KLEE: We've deployed that many stations.
2 We're a small state.
3 (Laughter.)
4 BOARD MEMBER SHERRIFFS: Don't apologize. Don't
5 apologize.
6 (Laughter.)
7 BOARD MEMBER SHERRIFFS: Well done.
8 MR. KLEE: Thank you.
9 Christine Kirby is next.
10 CHAIR NICHOLS: I assume you mean a level 2 or
11 higher, not just a plot, right?
12 Okay.
13 MS. KIRBY: Good morning, Chair Nichols and
14 members of the Board. I'm happy to be here, and thank you
15 for the opportunity.
16 Massachusetts is, like Connecticut, happy to be
17 among the states that have implemented the Advanced Clean
18 Cars program. And I'm pleased to be here with both New
19 York and Connecticut in strong support of the staff's
20 recommendations.
21 You heard from Commissioner Klee on the 177 state
22 greenhouse gas reduction goals. And in Massachusetts we
23 updated our clean energy and climate plan at the end of
24 2015. And we will be finalizing new rules in August in
25 response to Governor Baker's executive order on climate

1 change to ensure our 2020 goal is met.
2 Without the California program, we will not
3 achieve our near- or long-term goals; and those are our
4 greenhouse gas reduction goals.
5 The rest of my presentation will be focused on
6 the ZEV requirements.
7 Next slide please.
8 --o0o--
9 MS. KIRBY: A key theme you will here today is
10 whether the 177 states are ready for ZEVs in doing our
11 part. The answer is unequivocally yes. There is good
12 news in our states, as shown by this chart. Sales are up.
13 In December of 2016, Massachusetts saw the highest number
14 of rebates under our rebate program than any other month
15 since the program started in 2014. That's good news.
16 And the 177 states in 2016 saw an increase of 60
17 percent in total PEV registrations, which represents a 50
18 percent increase in market share in the Northeast.
19 Along with this, there are expanded numbers of
20 new models, including three models with all-wheel drive
21 capability. And that's something that we've heard
22 continually in the northeast, about the need to have
23 all-wheel drive vehicles. This also helped our sales.
24 Next slide please.
25 --o0o--

1 MS. KIRBY: More good news. Our states continue
2 to add charging stations in anticipation of a major
3 increase in vehicles beginning in the 2018 model year when
4 "travel" goes away. As many of you know, "travel" has
5 been in place, and we are anticipating that going away in
6 2018.
7 This chart shows that infrastructure is much
8 farther along in our states than it was in California,
9 when California ZEV requirements took effect in California
10 in 2012. Of interest is why we have -- still have fewer
11 stations in terms of absolute numbers. We actually have
12 doubled the capacity relative to the number of PEVs
13 currently on the road in our states. So one outlook for
14 every 10 PEVs compared to one outlook for 20 in
15 California.
16 Next slide please.
17 --o0o--
18 MS. KIRBY: Now, for the not-so-good news.
19 Because of the travel provision, manufacturers have faced
20 no binding sales requirements in our states -- in the
21 Northeast states; and it's not surprising that they have
22 not made meaningful effort to promote their vehicles in
23 our region. Or in many cases to even make them available
24 for a test drive.
25 Of five of the six OEMs, here's some examples:

1 The GM Spark EV, not for sale in the Northeast.
2 The Toyota RAV4, not for sale in the Northeast.
3 The Fiat Chrysler 500E, not for sale in the
4 Northeast.
5 Honda Fit EV. It's been for sale but the total
6 volume is capped. And one particular piece of
7 information: Only three rebates have been issued under
8 the Massachusetts rebate program in Massachusetts, simply
9 because the vehicle is not available, and it's not because
10 of a lack of interest.
11 And finally the Ford Focus. It is available, but
12 not in the numbers that we'd like to see.
13 Next slide please.
14 --o0o--
15 MS. KIRBY: Continue in this theme. We have been
16 pleased to see that many new battery electric products are
17 being introduced into the market. But, again, many have
18 been and remain practically unavailable, and there's three
19 examples of that here too.
20 Next slide please.
21 --o0o--
22 MS. KIRBY: We've presented this type of data in
23 the past. This is also on the issue of vehicle
24 availability. And we shared this at one of the past board
25 hearings. This snapshot was taken just two weeks ago and

1 compares vehicle availability in Sacramento and in Boston.
2 And the picture tells the story. You'll see much more
3 vehicle available in California than we do in Boston.
4 So given this reality, it's hardly surprising
5 that PEVs are selling more rapidly in California than in
6 our states.
7 Next slide please.
8 --o0o--
9 MS. KIRBY: We have identified consumer
10 awareness, as Anna has mentioned, as an issue. And we
11 note that vehicle marketing is critical in our states.
12 Looking at a measure of marketing effort, this slide shows
13 advertising dollars spent in 2015 with a Chevy Volt and a
14 Nissan Leaf. While both GM and Nissan both ran some ads
15 nationally, they chose to spend heavily on advertising
16 targeted for California consumers.
17 So comparing this investment in California to the
18 total lack of similar investment in the Northeast, it's
19 not surprising at all to see the discrepancy in numbers
20 from California and in the 177 states.
21 Next slide please.
22 --o0o--
23 MS. KIRBY: Moving onto the staff
24 recommendations. As I mentioned earlier, the 177 partner
25 states support the staff recommendations on the ZEV

1 requirements and the other parts of the Advanced Clean
2 Cars program. And I would like to make the following
3 seven points.
4 Number 1, banked credits mean industry can comply
5 through 2021 with no increase in market share. So that is
6 very important.
7 Number 2, scheduling a review too soon
8 perpetuates the incentive to fail. We need to make more
9 time to make the program work, particularly in the 177
10 states given "travel."
11 Number 3, technology is proven and costs continue
12 to fall.
13 And 4, most OEMs have not yet tried to build the
14 ZEV markets in the Northeast or in California to the
15 extent that's necessary.
16 Number 5, we need to focus on 2026 and beyond to
17 achieve the long-term greenhouse gas reductions. And
18 electrification of the transportation sector is essential.
19 We know this in Massachusetts and we know you know that
20 here as well.
21 A couple of comments on the midterm review. This
22 occurred five years after the initial 2012 commercial
23 volumes in California took effect. We need five years in
24 the Northeast as well. So we do not need another midterm
25 review until at least 2023. We need to build the market

1 post the travel provision going away.
2 Next slide please.
3 --o0o--
4 MS. KIRBY: Similar to Connecticut, I'd like to
5 provide some highlights of what's going on in
6 Massachusetts. The first is we enacted a piece of
7 legislation at the end of 2016.
8 Couple of highlights: The utilities can now
9 submit proposals for cost recovery of EVSE in
10 Massachusetts. And two utilities have done that. They've
11 filed with our Department of Public Utilities, which is
12 great news.
13 And building codes can include requirements for
14 EVSE, which is now under discussion in Massachusetts.
15 In 2016, we added $12 million to our EV rebate
16 program. This program is called the Massachusetts Offers
17 Rebates for Electric Vehicles, or MOR EV. This program
18 began in 2014. We've had great success with it.
19 We also implement two additional incentive
20 programs under the banner MassEVIP. The first is to
21 public entities, both the state fleet and municipalities.
22 So far we have funded 208 vehicles and 69 charging
23 stations under that program.
24 Also, we have a separate piece of MassEVIP where
25 we fund workplace charging. We've identified that as an

1 important piece to provide consumers with certainty that
2 they can charge. So far we've funded 388 units and 618
3 charging ports in Massachusetts. It's a very, very
4 popular program.
5 And finally, we've been partnering with Plug In
6 America - I know they're here today - on the first
7 statewide Mass Drive Clean program. We've hosted a number
8 of EV ride and drive events. So that's been very
9 successful.
10 And we've shown that people that ride in an EV
11 are more likely to buy an electric vehicle after they get
12 into one of these vehicles. So that's been exciting.
13 So to conclude, on behalf of the Baker-Polito
14 Administration, thank you for the opportunity to be here
15 today, and we look forward to working with California on
16 these issues.
17 Thank you.
18 CHAIR NICHOLS: Thank you.
19 MS. KIRBY: And I will now turn it over to my
20 colleague from New York, Steve Flynn.
21 CHAIR NICHOLS: Good morning
22 MR. FLYNN: Good morning, Chair Nichols, Board.
23 Thanks for having us here today. Thanks for providing the
24 opportunity for us to speak.
25 I'm Steve Flynn. I'm the Director of the

1 Division of Air Resources at New York State's Department
2 of Environmental Conservation. I'm also a somewhat
3 familiar face, appearing here over the history of time.
4 Commission Klee stole some of my thunder. Yes,
5 indeed, we just this week announced in New York a $70
6 million incentive program for electric vehicles. It's a
7 point-of-sale rebate program. So it reduces the
8 out-of-pocket expense for the buyers at the time.
9 It also includes a significant effort towards
10 additional outreach, so that we have an educated consumer
11 base. That follows closely on the heals just a couple
12 weeks ago of announcements for an additional 450 workplace
13 and public charging stations around the state.
14 And another important point I wanted to make is
15 relative to staff's presentation this morning on -- in
16 particular New York dealers have expressed concerns about
17 the distribution of credits and the timing of credits.
18 And we appreciate staff's recommendation to take a hard
19 look at this and to monitor this over time to see if there
20 is a problem. And we will most certainly be working with
21 staff on that and helping to understand the issue and
22 making recommendations if necessary.
23 Can I have the next slide please.
24 --o0o--
25 MR. FLYNN: Sometimes going forward requires us

1 to look backwards. And we have indeed come a long way
2 together. And the emphasis here is on "together."
3 California and the Section 177 states over time has -- the
4 program has been a partnership. Certainly California has
5 the leadership authority under Section 209 of the Clean
6 Air Act. Properly so. The issues here in California
7 predate federal efforts and have been severe, and
8 California is staffed and capable and equipped to address
9 those issues, as we've seen time and again with the work
10 of staff, as we saw at the beginning of today's -- with
11 the presentation to staff for their excellent efforts on
12 the Volkswagen case.
13 Section 177 allows other states to adopt the
14 program provided certain tests are met. We've done so.
15 And we have done so from the beginning. Mass and New York
16 were at the very beginning. We've been shoulder to
17 shoulder with California all along the way. It's not
18 always in full agreement, but nonetheless working closely.
19 We work closely with staff as these programs are developed
20 as staff -- we come to the Board to speak to you, to tell
21 you what we think and how these things affect us.
22 We also support you in Washington. When things
23 like waivers are up, we weigh in on those waivers.
24 We also support you in court. The Mass versus
25 EPA greenhouse gas decision certainly was a foundational.

1 The Green Mountain Chrysler-Plymouth case in Vermont on
2 the first round of greenhouse gas standards was pivotal.
3 And so we're here. We're with you. We believe
4 in what we're doing. We believe in what you're doing.
5 But some of that is also the flexibility that is necessary
6 going forward. Staff spoke of the optional compliance
7 plan and the travel provisions. We understand that. We
8 understand that this technological development sometimes
9 needs to germinate and mature in one place before it can
10 spread widely. We've supported those provisions. We
11 helped develop the optional compliance plans through
12 negotiations with staff and manufacturers.
13 California clearly has the lead, but the Section
14 177 states bring along market breadth and understanding to
15 really stabilize the results and improve the overall
16 results of what it is you're trying to do.
17 Can I have the next slide please.
18 --o0o--
19 MR. FLYNN: Why? Well, talking about greenhouse
20 gases. 177 states are all pretty much coastal, just like
21 California is. And certainly sea level rise is a highly
22 visible and very problematic issue associated with climate
23 change. My office is in Albany. I'm 140 miles from the
24 Statue of liberty, and yet I can watch the tide in the
25 Hudson River estuary out of my window. It's a big

1 problem. It's not just skirting the edges, and it's
2 pervasive.
3 Motor vehicles are the biggest part of our
4 greenhouse gas inventory in the Northeast. In fact,
5 they're also the greatest part of our criteria pollutant
6 inventory.
7 VMT continues to grow. We are controlling
8 stationary sources. We have cap-and-trade programs for
9 power plants for greenhouse gases. We're investing those
10 proceeds into energy efficiency.
11 We're doing what we can where we can. We need
12 the cars too.
13 But it isn't just greenhouse gases. We're also
14 nonattainment in metro New York area for ozone. Just like
15 with greenhouse gases, the motor vehicle sector is our
16 largest single sector. We can't get to attainment. We
17 can't get to the public health we're looking for without
18 the controls. So the California program is important as
19 part of our SIP as well.
20 Next slide please.
21 --o0o--
22 MR. FLYNN: But a key piece of this is that it's
23 working. From the beginning, the program -- very
24 beginning -- it has been identified as technology forcing.
25 And it has been. You know, the original standards when

1 someone put a LEV standard up on the board, everyone
2 cringed and said, "How will we ever get there?" Well, we
3 have. But you have, we have, the manufacturers have; and
4 don't lose site of that.
5 There's been a great deal of development here
6 and -- you know, I look at this slide and I recall that
7 when the Toyota Prius came out -- generation 2 Prius came
8 out in 2004, Toyota lost money on every one they sold.
9 They never said how much. I can't blame them. But since
10 then it's evolved. They've learned. They've matured the
11 product. They've refined the product. They've found ways
12 to contain the cost. It is my belief that it is now a
13 profitable automobile. And more than that, it's a
14 flagship for them. The technology is advancing. The
15 program is working. There are 300-mile BEVs that are out
16 there now. We didn't -- just didn't have that recently.
17 And some of these technologies are expan -- some
18 of the advancements that have occurred because of these
19 vehicles have expanded into other markets. We talked
20 about the 48-volt start-stop. I don't think we'd have
21 been there without the technology forcing elements of this
22 program. Some of this stuff would have happened, to be
23 sure. But I don't think any of us believe it would have
24 happened in the time frame that we're looking at now. And
25 time is important.

1 Another key piece of the evolution of the program
2 though has also been the relationship between states and
3 the manufacturers. We're not adversarial. We meet
4 regularly, often, to talk about the issues for advancing
5 this technology, for getting the marketplace mature, for
6 improving the salability and usability of these products.
7 So that is just -- it is another part of the evolution.
8 For example, we've been meeting -- we meet multiple
9 times. And just in a couple weeks at the New York Auto
10 Show we have a couple of days of meetings scheduled with
11 177 states. I think California is coming, and
12 manufacturers, at a showcase event of theirs.
13 Next slide please.
14 --o0o--
15 MR. FLYNN: This is kind of demonstrative of it.
16 That in just a few years we've seen range drastically
17 expand, charging time greatly improved. Certainly a key
18 is to users that they are not spending a lot of time
19 charging. This is -- these are things that just are
20 continuing to evolve and continuing to develop. Charging
21 is being installed now at 150 kilowatts. We have
22 planning -- the charging is on the planning board for 300
23 kilowatts. I'm not quite sure how we're going to maintain
24 the heat and deal with that, but we'll figure it out.
25 And the marketplace is competing on these

1 parameters. They're not just doing it; they're competing
2 on it.
3 We're now at an inflection point. The inflection
4 point is, as Christine described, the end of travel and
5 the bringing forward of the requirement in the 177 states.
6 We support the staff's recommendation to proceed with the
7 program. Let us move a foot. Let us keep an eye on it
8 but move forward.
9 Certainly it's a significant obligation for
10 manufacturers. But - and this is an important "but" -
11 manufacturers, states, consumers, infrastructure providers
12 all need certainty, a little bit of certainty. And as
13 staff said, push it out there a few years before we get
14 back at work at it. And Christine said this too. Let's
15 leave it in place for a while. Give us all some
16 certainty. And I think that's what we're asking for the
17 Board.
18 So in closing - just a couple of comments -
19 again, we support -- we stand here today to support the
20 staff recommendation as it -- as California seeks to
21 reduce the environmental impact of motor vehicle
22 technology, and do so in a progressive but achievable
23 manner.
24 We're committed to continue to work with the
25 manufacturers to address the obstacles and to help educate

1 consumers. We will work with infrastructure providers and
2 other stakeholders to ensure that consumers can experience
3 a seamless transition to the cleanest technology out
4 there. And it's important, folks. Tomorrow's environment
5 is counting on what happens here today.
6 Thanks.
7 CHAIR NICHOLS: Thank you very much. Thanks to
8 the three of you for traveling out here and spending the
9 time with us. And I assume that you're going to be
10 available throughout this discussion. And if possible, it
11 would be helpful to have you also present during the
12 discussion on the Volkswagen ZEV investment plan; because
13 while we're dealing only with the California plan here
14 today, there is a national plan that they've prepared as
15 well. And it would be interesting to get your comments on
16 how you see that helping us all out.
17 So thank you.
18 We do have two other state representatives with
19 us who were not part of this presentation. One is our
20 neighbor from Oregon, Leah Feldon. And then we'll also
21 hear from NESCAUM, which represents a whole group of
22 states.
23 So let's start with Leah please.
24 Welcome.
25 MS. FELDON: Good morning, Chair Nichols and

1 members of the Board. My name is Leah Feldon, and I'm the
2 Deputy Director of the Oregon Department of Environmental
3 Quality.
4 Thank you for allowing me the opportunity to
5 comment to the Board today. I'm very pleased to be here.
6 And I do want to briefly acknowledge my staff with me here
7 today, Dave Nordberg. Dave is our transportation program
8 coordinator, or better known as our LEV-ZEV expert.
9 On behalf of the Oregon Department of
10 Environmental Quality, I want to commend auto
11 manufacturers for the strong progress they've made meeting
12 future greenhouse gas and zero-emission vehicle
13 requirements. Since the adoption of the 2012 ZEV and LEV
14 III rules, the auto industry has made significant strides
15 in reducing greenhouse gases from conventional light-duty
16 vehicles and dramatic advances in emission-free vehicles.
17 We also want to recognize the substantial effort
18 the California Air Resources Board devoted to this midterm
19 review. We admire the breadth of this study, and conclude
20 it is appropriate to retain the current requirements for
21 the 2022 to 2025 model year vehicles.
22 Zero-emission vehicles are essential to meeting
23 Oregon's long-term greenhouse gas emission targets for
24 2050. Relaxation of the LEV III or ZEV rules would reward
25 manufacturers who made the least effort to prepare for

1 future requirements and do a disservice to manufacturers
2 who made the greatest effort to develop and market
3 compelling low-emission products.
4 We agree with the ARB staff that the auto
5 industry's progress raises the question whether the
6 requirements for 2022 should be strengthened. We also
7 want to emphasize the critical importance of regulatory
8 certainty, and therefore we believe it is appropriate to
9 continue the existing requirements unchanged.
10 However, conventional vehicles with even lower
11 greenhouse gas emissions are necessary for a secure
12 future, as are much larger numbers of ZEVs. And as we
13 heard in presentations today, the technology costs to
14 produce said vehicles is going down. To meet the imminent
15 need to future reduce greenhouse gas emissions, we urge
16 you to continue your pioneering work by developing strong
17 new standards for the period following 2025.
18 Oregon thanks you for all of your work to date
19 and future work combating greenhouse gas emissions to
20 protect public health and our environment.
21 Thank you very much for your consideration.
22 CHAIR NICHOLS: Thank you. We also admire what
23 Oregon has done to promote the whole market for EVs
24 through your Drive Oregon program. And I don't know if
25 you were prepared to comment. But I saw something the

other day since I subscribe to your emails about a transformation in the program. Do you want to say a word or two about what you're up to there. Or if you don't want to, you don't have to.

MS. FELDON: Chair Nichols, members of the Board. I don't think we're prepared to talk about the Drive Oregon program at this time.

CHAIR NICHOLS: All right. That's okay.

MS. FELDON: But I would be happy to get back with you an some information.

CHAIR NICHOLS: Well, we'll talk later. Thank you.

MS. FELDON: Thank you very much.

CHAIR NICHOLS: Thank you.

Matt Solomon from NESCAUM.

Welcome, Matt.

MR. SOLOMON: Thank you very much. Good morning, Chair Nichols, members of the Board. Appreciate the opportunity to be here. You've heard a lot from the 177 states, so I'm going to try to keep this brief.

I think we've shown our states have done everything that they can do to prepare the market to get ready for these cars. But we can't build the market on our own. It is time for the automakers to step up. We need them to come into the market, not just with product,

1 but with the earnest and energetic marketing effort that
2 they make with vehicles that they actually want to sell.
3 Thus far they have not made the effort to build ZEV
4 markets in the northeast because they haven't had to.
5 They haven't had to because of the "travel" provision.
6 Therefore we strongly agree with staff's recommendations
7 and we hope you will too.
8 Thanks very much.
9 CHAIR NICHOLS: Okay. Thanks.
10 Next we'll turn to Henry Hogo from the South
11 Coast AQMD.
12 Good morning, Mr. Hogo.
13 MR. HOGO: Good morning, Chairman Nichols and
14 members of the Board. I'm Henry Hogo, Assistant Deputy
15 Executive Officer at the South Coast Air Quality
16 Management District.
17 I'm pleased to be here today to provide the South
18 Coast District's staff support of the staff
19 recommendation. We strongly believe that these standards
20 should be maintained as determined by the midterm review
21 for the greenhouse gas standard. We certainly support the
22 1 milligram standard. In fact, at the 2016 AQMP that you
23 approved yesterday - and I want to thank you for that -
24 shows that light-duty vehicles actually are the largest
25 source of directly emitted PM in our basin from mobile

1 sources. It's the fourth highest contributor. So we
2 strongly support that. And we strongly support the
3 zero-emission technology.
4 Locally we're going to continue to encourage
5 deployment of zero-emission vehicles, especially through
6 the Enhanced Fleet Modernization Program. And we look
7 forward to working with you on the post 2026 model year
8 standards and looking to strengthen that moving toward
9 more zero-emission vehicles.
10 Thank you again for the opportunity to speak
11 today.
12 CHAIR NICHOLS: Thank you.
13 We really do have a who's who of everybody in the
14 ZEV world here today.
15 So move next to John Bozzella from the
16 Association of Global Automakers.
17 MR. BOZZELLA: Thank you, Chair Nichols, members
18 of the Board. I'm John Bozzella, President and CEO of
19 Global Automakers.
20 Our companies sell 56 percent of the cars and
21 trucks purchased here in California, most of which are
22 made in the U.S. We employ over 10,000 Californians at 79
23 facilities, including 18 R&D centers and three North
24 America headquarters.
25 You'd think given the heated rhetoric here in

1 California and in Washington over cars, there's much that
2 divides us. Not so. We agree that we need to continue to
3 reduce greenhouse gas emissions and improve fuel economy.
4 We agree that developing advanced technologies and
5 consumer acceptance and demand for those technologies are
6 central to the achievement of our goals. We agree we
7 should be making decisions using the latest science and
8 data. We also agree that we must work together. And
9 fundamentally we agree that there is a more effective and
10 efficient way forward than regulatory programs that are
11 inconsistent and require different compliance paths with
12 no added benefit to our consumers or the environment.
13 When EPA prematurely ended its part of the
14 midterm review, we lost an important part of the
15 discussion, perhaps the most important part: making sure
16 we ended up with a fully aligned national program that
17 balances innovation, compliance, and consumer needs and
18 wants. Last week's decision to reopen the midterm review
19 without prejudging the outcome is fully consistent with
20 the commitments ARB, EPA, NHTSA, and the industry agreed
21 to back in 2012.
22 I want to assure you that we are as committed to
23 the goals of one national program today as we were in
24 2012. Right now we should all be getting back to work on
25 this. And your role will continue to be important for the

1 2022 to '25 standards and beyond.
2 Let me turn briefly to the ZEV mandate.
3 The program does have problems. We all know
4 this. We need to understand the state of the market, not
5 just the state of the technology. Meeting the significant
6 numbers here in California will be a big challenge. But
7 here at least you understand the importance of investing
8 in infrastructure and incentives to encourage markets.
9 This is why in percentage terms we're selling six times as
10 many ZEVs in California as in the Northeast states, with
11 similar numbers of models available for sale.
12 Second, the programs now who focus on one
13 electric technology rather than the broad range of ZEV
14 technologies distract us from what really matters, getting
15 more ZEVs into the marketplace by increasing consumer
16 awareness and acceptance; and it likely leaves benefits to
17 the planet on the table.
18 We've invested billions in advanced technology
19 vehicles. We remain committed to developing sustainable
20 markets for them and we look forward to working with you
21 to accomplish this critical goal.
22 Thanks for your time. I hope we get an
23 opportunity to discuss this and answer any questions you
24 have.
25 CHAIR NICHOLS: Thank you.

1 MR. BOZZELLA: You're welcome.
2 CHAIR NICHOLS: Mr. Douglas, welcome.
3 MR. DOUGLAS: Good morning, Chair Nichols, Vice
4 Chair Berg and members of the Board. I'm Steve Douglas
5 with the Alliance of Automobile Manufacturers. It's a
6 real pleasure to be here.
7 I only have three minutes so I'll go ahead. And
8 if you go to the next slide. And actually I only want
9 three minutes.
10 (Thereupon an overhead presentation was
11 Presented as follows.)
12 MR. DOUGLAS: Of course there's been a lot of
13 media attention around the Trump Administration, the
14 Alliance, automakers, GHG, ZEV, midterm review, waivers.
15 So I thought it might be helpful if I just kind of laid
16 the groundwork and tell you what the Alliance position is
17 and where we're coming from.
18 First, we fully recognize that California has a
19 waiver for greenhouse gas and zero-emission vehicles and
20 low-emission vehicle programs. And we have not requested
21 or advocated for the Administration to overturn those
22 waivers. We haven't.
23 We have consistently supported the midterm review
24 on the original timeline as it was laid out and agreed to
25 in 2012. And we did ask the Administration to return to

1 this timeline. So last week -- last week's activity
2 simply brought us back to where we would have otherwise
3 been but for EPA's action at the end of the last year, at
4 the beginning of this year, which we believe was
5 premature.
6 So with that, I'd like to turn to ZEV, which is
7 actually more my specialty. If you could go to the next
8 slide.
9 --o0o--
10 MR. DOUGLAS: First I just want to point out that
11 18 through 25 regulations haven't even started jet. So
12 the manufacturers have made great progress in developing
13 30 -- almost 30 high quality zero-emission vehicles.
14 They're efficient. They're safe. They're reliable.
15 They're fun to drive. And California, for your part - and
16 we appreciate this - has been very good at creating a
17 comprehensive program of complementary measures. However,
18 I want to point out we are a long, long, long way from the
19 finish line. The ZEV market is not sustainable today.
20 The regulations are very aggressive in California. It
21 requires tripling of the sales. So sales have to triple
22 over the next few years. In the Section 177 states it's
23 five to ten times that amount. So it's a bigger hurdle.
24 And we do expect sales in the 177 states will increase
25 over the next few years. But we don't see any way that

they will reach the level that California's at in the time that's required. So I think right -- automakers are rightfully concerned about their ability to comply with these regulations.

We've recommended revising the requirements now. However, if not now, we'd ask the Board to continue to monitor this - and staff - and make appropriate changes, monitor the ZEV market and make appropriate changes in the 2019 time frame.

Thank you very much, and I'd be happy to answer any questions.

CHAIR NICHOLS: I think rather than engaging at this point, we should just go through the testimony, and then we'll have some conversation. Thank you.

MR. DOUGLAS: Okay. Thanks.

CHAIR NICHOLS: Ms. Lilly -- Amy Lilly. Good morning.

MS. LILLY: Good morning. My name is Amy Lilly and I'm here representing Mercedes-Benz. Today I'd like to talk about our robust investments in electric mobility and fuel cell vehicles, our plans for marketing these products, and our commitment to partnering with California to ensure our EV customers' infrastructure needs are met.

Due to time restrictions, I have left a longer version of my remarks in the record, and I'm going to be

1 doing some fast talking here.
2 Mercedes-Benz' goal is to become the undisputed
3 leader in EV sales in the premium segment by 2025, and we
4 will have over 10 electric models by that year. This is
5 an ambitious goal, but we have already begun to seriously
6 invest in the transition to a more heavily electrified
7 fleet.
8 By the end of 2019 we'll have six PHEVs on the
9 market and we will continue to offer BHEVs through 2025
10 and beyond because we believe advanced long-range
11 batteries offer customers a no-compromise solution.
12 Starting in model year 2018 a hundred percent of our
13 Smart vehicles will be EVs; and Mercedes-Benz will begin
14 to launch our EQ brand in 2019. EQ stands for electric
15 intelligence, and it's comprised of comprehensive electric
16 ecosystem of services, technologies, and innovations,
17 which will be fully scalable across all model.
18 Lastly, we'll introduce our GLC F-Cell later this
19 year at the Frankfurt Auto Show. Almost $11 billion of
20 our research budget have been dedicated to e-mobility, and
21 we have invested over $1 billion in our global battery
22 production. Investments continue to be made in
23 manufacturing capacity, hardware and designs; and, rest
24 assured, these investments will continue regardless of
25 what the discussions will be with the regulations.

1 But just offering compelling products will not be
2 enough. Mercedes-Benz fully supports what CARB stated in
3 Appendix B of the recommendations for the midterm review;
4 namely, that fleet transformation to near or pure ZEV also
5 requires consumers to demand and ultimately purchase these
6 products. We're simply not going to reach our joint goals
7 unless we can move beyond early adopters to the mainstream
8 consumers.
9 I'm here to dispel the perception that our
10 dealers are not serious about selling ZEV vehicles. And
11 we heard that mentioned by Christine Kirby a little bit
12 earlier. Mercedes-Benz U.S.A. has created a new
13 department specifically tasked with preparing our dealers
14 to sell ZEV vehicles by developing and executing new and
15 enhanced training programs, installing charging stations
16 at dealerships or sales and service needs, and embarking
17 on marketing efforts nationwide.
18 Turning to infrastructure. I think everyone is
19 in agreement that the number of stations is woefully
20 inadequate. Considering that all automakers have plans to
21 introduce a variety of models in all segments,
22 infrastructure must be exponential growth. To help
23 address the concern, we and other automakers are not only
24 building ZEV vehicles, but we're also investing in needed
25 infrastructure. For example, we recently invested in

1 Charge Point. Also, Mercedes-Benz has been actively
2 supporting the CPUC recommendations to mandate the ISO
3 15118 communications protocol to ensure ZEV, P -- excuse
4 me -- PEVs to infrastructure interoperability.
5 In closing, when our CEO, Dr. Dieter Zetsche,
6 announced our goal of becoming the EV sales market leader
7 within the premium segment by 2025 has signaled that
8 Mercedes-Benz is committed to deploying electrified
9 vehicles in the mainstream market. We plan to work
10 collaboratively with CARB and other stakeholders to
11 overcome our consumer acceptance in infrastructure
12 challenges. And, lastly, we're ready to start the
13 discussion about how best to encourage additional ZEV
14 deployment after 2025.
15 Thank you.
16 CHAIR NICHOLS: Thank you.
17 Mr. Lord.
18 MR. LORD: Good afternoon, Chair Nichols and
19 Board members. My name is Michael Lord, and I'm an
20 executive engineer for the Product Regulatory Affairs
21 Division at Toyota Motor North America.
22 First I'd like to talk a little bit about some of
23 Toyota's products. Our Prius Prime, which is our new and
24 significantly improved plug-in hybrid, is on the market
25 now. We believe the Prius Prime is the most fuel

1 efficient vehicle in the U.S. today with 133 mpge and an
2 estimated 640-mile range.
3 The EV range is 25 miles, and we've made many
4 improvements to maximize the driver's EV experience by
5 practically eliminating engine starts during those 25
6 miles.
7 And starting at 27,100, before the $4500 federal
8 tax credit, we think it's a great value.
9 So in addition to the Prius Prime, Toyota
10 continues to lead the initial market for fuel cell
11 vehicles with the Toyota Mirai, a ZEV with an estimated
12 312-mile range and a 3- to 5-minute refuel time.
13 And we'd like to thank Chairman Nichols and
14 Professor Sperling for being Mirai pioneers. We trust
15 you've had good experience with the vehicle.
16 However, you may have some issues so far with
17 infrastructure -- your experience with infrastructure at
18 this stage. And although we made some great progress in
19 California on stations, we have room for improvement in
20 the coverage, reliability, and speed of construction.
21 And my colleague, who's scheduled to speak next,
22 I think he will be later in the day. I think he's stuck
23 in Riverside traffic.
24 (Laughter.)
25 MR. LORD: We'll speak about that later.

1 (Laughter.)
2 MR. LORD: So regarding improving in the ZEV
3 Program, I wish to make --
4 CHAIR NICHOLS: You should have been here for the
5 VMT discussion yesterday.
6 (Laughter.)
7 MR. LORD: Right. Thank you.
8 Regarding improvements to the ZEV Program, I wish
9 to mention four broad and core requests today.
10 First, we believe the role of plug-in hybrids is
11 undervalued in the current regulation. We still believe
12 that PHEVs can fulfill a significant portion of the
13 emission reduction goals from 2030 to 2050, and that the
14 staff's assessment of the emission impacts needs further
15 evaluation. PHEVs are a technology that customers can
16 embrace, and we believe the credit structure and the
17 current cap should be adjusted in the regulation.
18 Second, we believe while progress is made in the
19 Section 177 states, it continues to lag the California
20 market. Our request is not to make changes today, but I
21 ask you to direct staff to come back to you with a more
22 robust assessment of the Section 177 state markets and
23 potential regulatory flexibilities to address it.
24 Third, we believe CARB should consider increasing
25 the maximum credits for PHEV, BEVs, and fuel cells. PHEV

1 credits are max'd out at 80-mile range, and BEVs and fuel
2 cells are 350. By raising this cap, we think it's a good
3 tool incentivizing longer range vehicles in all three
4 categories.
5 And fourth, and in closing, we need to look at
6 ways to further accelerate hydrogen infrastructure
7 development. In addition to improving the existing AB8
8 process with the Energy Commission, we encourage ARB to
9 consider additional funding and incentives, including
10 credits under the ARB existing programs, to help us move
11 beyond the hundred stations. And we would like to ask you
12 to direct staff to come back to you with recommendations
13 on how to accelerate the build-out of hydrogen
14 infrastructure.
15 Thank you.
16 CHAIR NICHOLS: Thank you. So your colleague is
17 not here. We'll proceed next to NRDC.
18 Simon Mui.
19 MR. MUI: Good morning, Chairwoman Nichols and
20 members of the Board. Thank you. I'm Simon Mui with
21 NRDC, director of our vehicles and fuels program here on
22 the West Coast.
23 First I want to thank staff for their years of
24 hard work on this review. It's been carefully done,
25 thoroughly analyzed. And I think you can all breathe a

1 breath of relief today. Your staff has provided
2 substantial evidence, substantial evidence that the
3 existing standards can be met on time, with no
4 technologies, and a cost lower than we originally
5 anticipated in 2012. In a nutshell, the program is
6 working.
7 Both the Legislature and the Governor have spoken
8 loudly and clearly last year in setting aggressive carbon
9 reduction goals for 2030, aggressive electrification goals
10 through SB 350, and calling for us as a state to really
11 double down on meeting our air quality requirements.
12 These standards we're talking about today are the
13 state's major tool to do that. It's achieving the most
14 carbon reductions to date under AB 32 and nationally
15 through the national program. It's the main policy driver
16 for electrification and helping to improve public health
17 in a state where 8 out of 10 people still are breathing
18 unhealthy air.
19 For these reasons, we're asking the Board to
20 green light staff's proposal. Let's maintain the steady
21 course that California has been on, and continue that
22 through 2025, and begin the stakeholder process and
23 discussions around the next steps post 2025, and further
24 improve and strengthen the ZEV standard through that
25 process.

1 All eyes are looking to us today, particularly
2 given last week's disappointing announcement from the
3 Trump Administration to reopen the review process
4 federally that was completed. That's the first step to
5 weakening federal clean car standards and fuel economy
6 standards. We know that.
7 As we've heard, California's program isn't just
8 benefiting the health and welfare of California, but
9 residents from 12 other states. That's 113 million
10 people, one-third of the U.S. population.
11 Over the past decades this agency has seen
12 federal administrations come and go. But each time it's
13 stayed true to its principles that it will continue to
14 lead and protect the public health and the welfare when
15 others lag, and let the technical evidence be the primary
16 guide for setting standards. And the weight of that
17 evidence today shows that these standards are very much
18 achievable. Please reaffirm these standards and continue
19 moving us forward.
20 And now I'll let my colleague, Irene Gutierrez,
21 make some additional comments.
22 CHAIR NICHOLS: Thanks.
23 MS. GUTIERREZ: Good morning. Irene Gutierrez
24 with NRDC.
25 As my colleague, Simon Mui, has noted, I'd like

1 to thank the Board and the staff for the years of work
2 that have gone into putting together the Advanced Clean
3 Cars program. I'll make comments on two sections. I'll
4 comment on the ZEV Program and also on California's
5 regulatory authority.
6 As we've heard from the states, the ZEV Program
7 is a key driver for expanding markets in California and
8 other states. And we've seen cost-tipping points like
9 this in the solar and the wind industry. And the ZEV
10 Program is working. It creates a market for plug-in
11 electric vehicles and drives costs down and makes vehicles
12 more accessible to members of the population.
13 Automakers can readily meet the targets that ARB
14 has set. As we've noted in our comment letter, expert
15 analysis has shown that the likely sales targets to meet
16 the ZEV requirements in California is 6 percent by 2025.
17 This is lower than the original figure of 15.4 percent
18 sales. ARB's analysis shows that 8 percent sales by 2025
19 is needed and even Auto Alliance's study shows that only
20 10 percent sales are needed.
21 So by all metrics, the ZEV Program is well within
22 reach and becomes increasingly attainable over time as
23 vehicle technology improves and you see higher range
24 vehicles coming on to the market. So with this in mind,
25 we support ARB's recommendation to maintain the ZEV

1 standards through 2025, and we support the proposal to
2 continue strengthening the program for 2026 and beyond.
3 We look forward to working with ARB and other
4 State agencies on complementary policies to continue
5 supporting the program.
6 I'd also like to note that we support
7 California's staying firm in its commitment to protecting
8 state residents from air pollution and climate threats.
9 We're disappointed by some of the comments that have been
10 made by global auto makers and the Alliance of Automobile
11 Manufacturers. These groups are now arguing that even if
12 California committed to match federal EPA standards, that
13 it sticks with its commitment even if federal standards
14 are weakened. We closely followed this process, the
15 various negotiations that went on in 2009 to 2012, and we
16 know that this is not what California agreed to.
17 California never agreed to surrender its independent
18 regulatory authority and leave its residents at risk.
19 Industry groups misrepresent what the parties agreed to in
20 signing on to a national program; and they selectively
21 quote the statements made by California in its 2011
22 commitment letter, which states that California agreed it
23 would only accept compliance with the federal standards as
24 long as they remained as strong as those that were set
25 forth in 2011.

1 California did not agree to accept every change
2 to EPA standards and it doesn't need a permission slip to
3 go forward with its own.
4 So for these reasons, we support what ARB has
5 proposed and we look forward to working with ARB and staff
6 in the future.
7 Thank you.
8 CHAIR NICHOLS: Thank you, Ms. Gutierrez, and
9 thank you for your clarification on what was agreed to at
10 the time. We've seen a number of statements about that
11 that have been troubling, not just about the one national
12 program but also about the nature of the midterm review
13 itself, which never was intended to have to go out to the
14 full possible length. It was not something that was even
15 contemplated at the time, that it must extend further. It
16 was supposed to be done when it was ready to be done. So
17 the recent cries of process foul about the EPA decision,
18 even though we weren't apart of it, struck us as being
19 strange, to put it mildly, and certainly not based on the
20 agreement that we were a part of.
21 So thank you for your comments.
22 Mr. Lutsey.
23 MR. LUTSEY: Chair Nichols, Board members. Thank
24 you so much for all of your great work cleaning up vehicle
25 emissions. I'm Nick Lutsey. I'm with the International

1 Council on Clean Transportation. Just wanted to give a
2 few reflections here from some of our recent work.
3 First, we conducted a major technical study that
4 we just released this week. It analyzes technologies and
5 costs to reduce carbon dioxide emissions in the 2025 and
6 2030 time frame. Our work parallels and updates all of
7 the great work from ARB staff as well as EPA and NHTSA
8 staff. I'll highlight just a couple findings.
9 We find that previous government estimates,
10 including the MTR and the TAR by the agencies,
11 overestimate the compliance costs by 30 to 40 percent.
12 And that's due to all of the very low cost efficiency
13 technologies that keep emerging in the fleet.
14 These standards based on these low cost
15 technologies are extremely cost effective. The consumer
16 fuel savings tend to be two to three times higher than the
17 technology costs. And those findings are robust in that
18 they stand up even in low fuel prices.
19 If ARB maintains 2025 standards, this will
20 certainly help ensure that the U.S. auto market remains
21 globally competitive as Europe, China and elsewhere
22 continue to move forward with tougher standards for their
23 markets.
24 Second, we've done extensive work analyzing the
25 electric market -- electric vehicle market developments

1 around the world. Clearly California plays in a central
2 role as an incubator of electric vehicle technology. We
3 found that San Francisco and San Jose are among the global
4 leaders, with 6 percent and 10 percent of new vehicles in
5 those markets being electric vehicles today.
6 6 to 10 percent new electric vehicle sales is
7 essentially where the ZEV regulation would have us here in
8 California by 2025. So clearly the market is developing
9 much quicker than ARB had anticipated.
10 So as part of all this, the ZEV Program is
11 certainly a critical catalyst. It increases model
12 availability. It nudges automakers to develop and market
13 the cars. It provides the timetable for infrastructure
14 investments.
15 At this moment clearly it's important to look at
16 2030 policy. Costs are dropping. Great new electric
17 vehicles keep entering the fleet. And long regulatory
18 lead time is critical.
19 To close, California's role as an incubator is
20 extremely important internationally. All of the
21 collaborations with Norway, the Netherlands, Quebec are
22 growing the global scale of ZEV technology. So thanks for
23 all your great work. It's really important to see all
24 these developments and make sure they do become global
25 developments.

1 Thank you.
2 CHAIR NICHOLS: Thanks.
3 Hold on just a second. I think Dr. Sperling
4 wants to say something.
5 BOARD MEMBER SPERLING: I want to just
6 acknowledge that Nick Lutsey played a very key role back
7 in developing the 2012 -- doing the technical work behind
8 the 2012 standards. Brilliant work, and also happens to
9 be one of my former students.
10 (Laughter.)
11 CHAIR NICHOLS: This is not a paid commercial.
12 (Laughter.)
13 MR. LUTSEY: Thank you, Professor Sperling. I
14 was taught very well. I really appreciate it.
15 (Laughter.)
16 CHAIR NICHOLS: Thank you. Thank you for that.
17 Okay. Next up we have Chet France from EDF.
18 Mr. France was also involved at the time in the 2012
19 process, and brings that expertise to this discussion as
20 well.
21 MR. FRANCE: Thank you, Chair Nichols and the
22 Board. These are topics that are very near and dear to my
23 heart.
24 On behalf of the Environmental Defense Fund and
25 more than 2 million members nationwide, I thank you for

1 the opportunity to speak today.
2 I want to offer our recommendations on the
3 midterm review and the post 2025 clean car standards. We
4 agree and support the staff's conclusion that the current
5 model year 2022 to 2025 standards remain appropriate.
6 Given the substantial and compelling record, we
7 recommend that the Board reaffirm California's commitment
8 to the current federal standards. These standard -- these
9 recommendations are based on extensive technical record
10 that included multiple opportunities for public comment
11 engagement and input.
12 The final determination in supporting analysis
13 show automakers and suppliers are developing and deploying
14 fuel-efficient technologies at a much faster rate than was
15 forecasted in the 2012 final rule. And they're doing it
16 as costs that are lower than projected in that rule.
17 The standards will be met with advances in
18 conventional technologies such as engine and transmission
19 improvements, lightweighting, and better aerodynamics.
20 These improvements have come alongside a dramatic rebound
21 in the auto industry. Vehicle exports are up. Sales are
22 at an all-time high, and the industry has added over
23 700,000 jobs since 2009.
24 Next slide please.
25 --o0o--

1 MR. FRANCE: Though the technical record
2 supports even more protected standards for 2022 to 2025,
3 EDF believes that the better approach is to strengthen the
4 standards for model year 2026 and beyond. Accordingly, we
5 recommend that the Board direct the staff to begin work on
6 strengthening the Greenhouse Gas and ZEV Program for 2026
7 and beyond.
8 EDF recently sponsored a study that examined
9 reductions that may be possible in the 2030 time frame.
10 Tom Cackette, who will follow me, who was one of the
11 authors, will provide the Board with a separate
12 presentation on the specific details of the report.
13 Though as a general matter, it confirms the feasibility
14 and cost effectiveness of deep CO2 reductions.
15 The major findings of the report are there are
16 under-utilized conventional technologies available to
17 further reduce CO2 emissions, the cost of lithium ion
18 batteries is declining rapidly, widespread introduction of
19 ZEV models is possible by 2030, and the availability of
20 cost competitive ZEV technologies opens a technological
21 pathway for all OEMs to achieve very large CO2 emission
22 reductions.
23 This analysis provides strong technological,
24 economic, public health, and environmental reasons for
25 initiating work necessary to begin defining the post 2025

1 Clean Car and ZEV Program.
2 Next slide.
3 --o0o--
4 MR. FRANCE: In conclusion, we recommend that
5 the Board reaffirm California's commitment to the current
6 2022 to '25 standards and direct the staff to begin work
7 on strengthening the Greenhouse Gas and ZEV Program.
8 Thank you for your leadership on these issues,
9 and thank you for considering our comments.
10 CHAIR NICHOLS: Thank you.
11 Are you aware of any new studies or reports or
12 other technical information that would call for a
13 reopening of the midterm review?
14 MR. FRANCE: No, I'm not. And this has been a
15 multi-year effort. I think it's more extensive than I've
16 ever seen in my whole career.
17 CHAIR NICHOLS: Okay. Thank you.
18 Mr. Cackette, welcome back.
19 (Thereupon an overhead presentation was
20 Presented as follows.)
21 MR. CACKETTE: Thank you. Appreciate the
22 opportunity to share with you the study that Chet
23 mentioned, which a colleague and I prepared for the
24 Environmental Defense Fund. And that study is looking at
25 the opportunities and the potential for achieving greater

1 CO2 emission reductions in the post 2025 standards, so --
2 future standards for the next five years or so.
3 I need to give you a little bit about the study
4 and what we did. First of all, we used the tool that you
5 used and that EPA used to do the TAR, the Technical
6 Assessment Report, and the Preliminary Determination
7 Report; and we made very few adjustments to it. We only
8 extended its modeling domain from 2025, which was the
9 purpose of this meeting, to 2030, and we used some updated
10 information which showed that the -- in the 2030 time
11 frame the cost of manufacturing a ZEV was going to
12 continue to decline.
13 And we have a number of scenarios, but I'm just
14 going to share just one with you.
15 So next slide please.
16 --o0o--
17 MR. CACKETTE: So this is the -- this slide shows
18 some of the key inputs and outputs that we came from the
19 study.
20 As an input, this shows you the declining costs
21 of manufacturing different types of ZEVs over time. So
22 you can see right now we're up there in the, you know,
23 $15,000 range. But you can see that by 2030, a
24 hundred-mile BEV is cheaper to manufacture than an
25 internal combustion engine vehicle. So this is the kind

1 of -- this is important input that shows why ZEVs will be
2 popular and effective in the future.
3 Click please.
4 --o0o--
5 MR. CACKETTE: A couple study results. One is we
6 looked at a scenario where there were no ZEVs available
7 and how much conventional technology could do. And we
8 found that you could do more than the 2025 standards but
9 only in the range of 10- to 30-gram-per-mile reduction
10 from the current standard.
11 --o0o--
12 MR. CACKETTE: But when we let ZEVs come into the
13 model for selection with these prices I just showed you,
14 then you could go all the way to 90-grams-per-mile
15 reduction, which is taking 173-gram standard and making it
16 an 83-gram standard. So a very big reduction.
17 So next slide please.
18 --o0o--
19 MR. CACKETTE: This is the results. And I'm
20 going to -- follow the colors, if you would.
21 We looked at 10-gram increments. And so here's a
22 50-gram increment and a 90-gram increment, and -- next
23 slide please.
24 --o0o--
25 MR. CACKETTE: -- you can see that the costs are

1 certainly there. There's a prices increase that the
2 consumer would see. But you can also see that the fuel
3 savings are two to three times as large as the capital
4 costs of the vehicle.
5 Next slide.
6 --o0o--
7 MR. CACKETTE: The payback period is five years.
8 The average person keeps a vehicle for 6.5 years on a new
9 vehicle.
10 And, finally, the number of ZEVs that would be in
11 the mix to achieve these standards at 50 grams per mile is
12 21 percent and then 40 percent. So a big increase beyond
13 what we have now but clearly feasible.
14 And final slide.
15 --o0o--
16 MR. CACKETTE: This is a pathway from your staff
17 that shows how many ZEVs you need to achieve the 80
18 percent reduction in emissions by 2050 that the Governor
19 has set as executive order.
20 --o0o--
21 MR. CACKETTE: And the next slide shows you where
22 these two scenarios fall on the curve. If you achieve a
23 90 percent re -- 90-gram reduction by 2030, you're right
24 on the curve towards the 2050 goal of 80 percent reduction
25 from this sector. And if the number is less than that at

50, you could see that you're somewhat below the line and would have to play catch-up in the later years after 2030.

So thank you very much.

CHAIR NICHOLS: Thanks. Before you go, Dr. Balmes had a question for you.

BOARD MEMBER BALMES: I'm not going to take credit for you being my student. I think it was the other way around.

(Laughter.)

BOARD MEMBER BALMES: But I am going to ask you, since you were the one that suggested I buy a diesel TDI Jetta --

(Laughter.)

BOARD MEMBER BALMES: -- what have you done with yours?

(Laughter.)

MR. CACKETTE: Well, I have one and my daughter bought one two weeks before the announcement that they were going to -- they had cheated.

So we still have them, but we're both going to sell them back. And I'm buying an electric vehicle to replace it.

(Laughter.)

(Applause.)

BOARD MEMBER BALMES: I already have.

1 CHAIR NICHOLS: To allow you to rebuild your
2 credibility here,
3 (Laughter.)
4 MR. CACKETTE: Please help me, Madam Chair.
5 CHAIR NICHOLS: Let me just ask you a question
6 actually about your comment about the 100-mile BEVs.
7 Because, not to speak for the manufacturers, but others
8 have commented independently that they don't really see
9 consumers making a big move to battery electrics -- full
10 battery electrics with less than the 200-mile range.
11 What's your opinion on that?
12 MR. CACKETTE: Well, that scenario that we
13 presented included a 50 percent mix of 100-mile BEVs and
14 the other 50 percent being 200-mile. And I don't really
15 know what people are going to select. If 200 miles is,
16 you know, a thousand dollars more than a hundred miles,
17 you know which one you're going to buy. But if there's a
18 bigger price difference, I think there will be some sales
19 of lower ones for urban use as a second car - that's kind
20 of what we're doing with all the Leafs that are out there
21 now, for example - and other people that want to try to
22 make this vehicle as primary vehicle will go for the 200
23 miles and pay the extra money. So I think it will be a
24 mix.
25 And we didn't show any plug hybrid electric

1 vehicles in there, because they're actually a more
2 expensive choice for manufacturing. But from a consumer
3 standpoint, a lot of people that want one car are going to
4 go for the Volt-like vehicle and use it urbanwise
5 electric. And so I think there will be a mix of those as
6 well.
7 CHAIR NICHOLS: Thanks.
8 Okay. Rasto Brezny from MECA.
9 DR. BREZNY: Good morning, Chair Nichols and
10 members of the Board. I'm Rasto Brezny, the Executive
11 Director for the Manufacturers of Emission Controls
12 Association.
13 MECA members supply the many technologies that
14 allow light-duty vehicles to comply with both the
15 greenhouse gas and the criteria pollutant requirements
16 under the Advanced Clean Cars program. These include
17 things like fuel injection, turbochargers, all the way out
18 to 48-volt technologies, and the types of catalysts and
19 filters that are required for these different powertrains
20 to achieve criteria pollutant requirements. So we agree
21 with staff's conclusions and their recommendations.
22 So I want to focus on an area where we feel that
23 more can be done sooner. And this is in the area of PM
24 reduction.
25 PM -- we know that PM is really not just an

1 inventory issue. It's also a health issue; it's a climate
2 issue with black carbon; and its a toxics exposure issue
3 as well.
4 So, you know, we expect that by 2025, half the
5 new vehicles made are going to come equipped with the
6 gasoline direct-injected engines. So we've spent a lot of
7 time characterizing the PM from these vehicles, and we
8 know that the GDI PM is very similar to the diesel PM. It
9 has many of the same components, as well as the black
10 carbon that's contained.
11 Other parts of the world have chosen to address
12 this change in fleet mix by establishing particle number
13 standards. And Europe will adopt these in 2017, later
14 this year; China, in 2020; and India, in 2023. The
15 particle number standard is roughly equivalent to half a
16 milligram per mile.
17 So you see that the same manufacturers that sell
18 cars in California are going to have to comply with much
19 tighter PM standards in other parts of the world sooner
20 than 2025.
21 So we've -- numerous studies have shown that, you
22 know, these low PM levels can be achieved either through
23 better fuel injection technology or gasoline particulate
24 filters. And there's a number of vehicles on the road
25 today that are exceeding the one milligram standard.

1 So catalyzed GPFs go a step beyond that by not
2 only reducing the black carbon, but also the toxics and
3 other compounds that are associated with the PM by over 90
4 percent, with no impact on CO2 or fuel economy.
5 So we'd like to work with your staff to look at
6 voluntary incentives that could be used to incentivize
7 this best available control technology here in the U.S.
8 through a modest CO2 credit for achieving the
9 one-milligram standard sooner by putting on the best
10 available control technology on these vehicles.
11 Thank you.
12 CHAIR NICHOLS: Thanks.
13 Mr. Noyes.
14 MR. NOYES: Good morning, Chair Nichols, members
15 of the Board. My name is Graham Noyes. I'm the Executive
16 Director the Low Carbon Fuels Coalition. We're an
17 organization dedicated to the support and expansion of low
18 carbon fuel policies.
19 We provided detailed written comments for the
20 record. I will move through them quickly, but would
21 recommend those for any points that are raised here that
22 you'd like to look at in more depth.
23 And we come forward neutral. We certainly
24 recognize the great work by staff that went into this
25 report and the very -- excuse me -- challenging situation

1 that we're in -- sorry, I've got an allergy raising here.
2 California's plan relies upon EPA's final
3 determination in NHTSA. But when Senator Chao and --
4 Secretary Chao and Administrator Pruitt signed the notice
5 of intention to reconsider the final determination of
6 greenhouse gas standards for model year 2022 through 2025
7 light-duty vehicles, that was a game changer. And we
8 recommend to staff and to the Board to recognize that that
9 was a game changer. The automakers are effectively on a
10 five-year time frame, and so 2022 is today from that
11 perspective. We've now seen the federal process open.
12 And the midterm review itself recognizes that the findings
13 would likely be different if the stringency of the
14 national greenhouse gas standards were substantially
15 changed.
16 So our recommendation is that the Board keep the
17 Advanced Clean Car rule -- the midterm review open, and
18 establish a return to the Board to discuss what's
19 happening on the federal front, so that California can
20 remain nimble on its feet and be aware of what's happening
21 with the changing federal landscape here.
22 We also recommend that California build flex fuel
23 vehicles and mid-level ethanol blends back into its policy
24 program. Those have proven to be very successful in terms
25 of reducing petroleum dependence and also delivering

1 greenhouse gas reductions. We've seen the carbon
2 intensity of ethanol drop to about 20 percent less than
3 gasoline. Of course ethanol substitutes completely for
4 gasoline as a fuel. So to achieve those two goals
5 California's invested millions in a network of E85
6 stations and 20 million gallons of E85 was delivered last
7 year into California vehicles. Those vehicles provide
8 reductions in disadvantaged communities, as is required by
9 AB 197, so it's an on-the-ground solution. And as NREL
10 has said, FFVs can provide a bridge between our current
11 situation to the future realm of new vehicles.
12 So our specific recommendation is for the Board
13 to receive an update in three months that includes a
14 review of integrating a flex fuel vehicle/mid-level
15 ethanol blend component into the Advanced Clean Cars rule.
16 And our perspective is that in a dynamic federal
17 landscape, California's going to need to be both tough and
18 flexible to achieve its goals.
19 Thank you.
20 CHAIR NICHOLS: Thanks. Tough and flexible.
21 Sounds like a pretty good mantra.
22 Ken Morgan. Morning.
23 MR. MORGAN: Hi.
24 Chair Nichols, members of the Air Resources
25 Board. Thank you for the opportunity to speak here today.

1 My name's Ken Morgan. I'm with Tesla.
2 And I guess I'll just start by saying we're very
3 excited to be launching our Model 3 vehicle this year.
4 That's a car that is fully electric, zero emission,
5 $35,000, with over 200 miles of range.
6 And just a quick note on market acceptance. With
7 that vehicle, within the first two months of announcing
8 unveiling that car, we received 373,000 deposits
9 worldwide. And many of those deposits were from
10 California customers. So the market is certainly there
11 for the right type of vehicle, and we're looking forward
12 to getting that off the production line.
13 And just a quick note on the midterm review.
14 Clearly this is a very critical moment in the history of
15 the ZEV movement. And certainly your decision here today
16 will have an impact, and the guidance you provide will
17 have an impact on the next decade of investment by the
18 automotive community in this technology. And we know this
19 because the federal regulations, Greenhouse Gas Cafe, can
20 be met with incremental improvements to existing
21 combustion engine technologies. So it really is the --
22 California's regulation that is driving these near-term
23 investments in pure zero-emission technology, and that's
24 why it's so critically important. And certainly also
25 important to hitting some of the emissions goals that were

1 outlined by the staff earlier.
2 As Anna mentioned during her presentation, in
3 terms of the technical assessment of the trajectory of the
4 ZEV mandate -- and I do just want to recognize briefly
5 that the staff has done a fantastic job with the technical
6 review of the ZEV regulation. But she mentioned staying
7 the course. And so I think it's just important to note
8 that the course that was set in 2012 was 15 percent of
9 sales by 2025. And so if we choose to make no change to
10 the regulation, in fact we are setting a new course that's
11 been reviewed by both staff and other folks that have run
12 this analysis, that's about half of that trajectory that
13 was anticipated when the credit targets were set in 2012.
14 So we certainly feel that it's really important
15 to look at this credit oversupply and to make a decision
16 to amend the regulation as soon as possible to get us back
17 on track to hit some really significant milestones by
18 2025, such that we are on an upward slope towards that
19 2030 goal.
20 As the staff have outlined in their scoping plan
21 update, we need something in the order of 4.2 million
22 plug-in cars by 2030 to hit the state goal of 40 percent
23 GHG emissions reduction. But the current trajectory of
24 the regulation only gets us to 1.2 million by 2025. So
25 it's pretty heavily backweighted today, and I think that

1 does put the 2030 goal at risk. So we certainly would
2 recommend that the Board take some near-term action as
3 quickly as possible to address the oversupply of credits.
4 Thank you.
5 CHAIR NICHOLS: Thank you.
6 MS. HOLMES-GEN: Good morning, Chair Nichols and
7 Board members. Bonnie Holmes-Gen with the American Lung
8 Association in California; and also a proud ZEV owner of
9 over three years.
10 California's leadership on clean cars is
11 providing tremendous returns in health and clean air
12 benefits, not just for California but for all the ZEV
13 states and indeed around the world. We have been pleased
14 that the American Lung Association be able to quantify
15 those benefits in own report, Clean Air Future, that we
16 released last fall. And I wanted to just talk for a
17 moment about some of those health benefits.
18 Our report finds a widespread shift to
19 zero-emission vehicles in all the ZEV states, a shift that
20 builds on our current ZEV regulation, Advanced Clean Cars,
21 and ramps up to 65 percent of ZEVs in our fleet by 2050
22 would bring tremendous health benefits. And this would
23 bring benefits to millions of people in all of our states.
24 The public right now is bearing a huge cost, billions of
25 dollars annually in health expenses and climate damage

1 from our dependence on petroleum fuels.
2 Or to bring it down to a more personal level, for
3 each 16-gallon tank of gas we're burning, it costs society
4 about $18.42 in health and climate impact costs. This is
5 a very conservative estimate and only looking at the
6 passenger vehicle sector. So moving to zero emission,
7 it's going to dramatically reduce these costs and increase
8 the benefits to public health.
9 Here's the bottom line. A robust ZEV Program in
10 2050 would result in over 90 percent reduction in
11 emissions that generate smog and soot from vehicles,
12 around 85 percent reduction in health impacts, and more
13 than a 50 percent reduction in greenhouse gases from
14 passenger vehicles compared to 2015, which is similar to
15 taking all the cars off the road in the Northeast states.
16 And this adds up to a savings of over $33 billion. And
17 that's 20 billion in health savings alone across the
18 zero-emission vehicle states.
19 This is an enormous advance for public health.
20 We can break it down and look at:
21 Reductions in asthma attacks. 96,000 fewer
22 asthma attacks.
23 Reductions in lost work days and reductions in
24 premature deaths. Over 2,000 fewer premature deaths.
25 We have all this data. We've shared it with you.

1 But I want to make sure that we've brought it into clear
2 focus today as you're looking at this important regulation
3 and determining the future.
4 To conclude, please direct the staff to move
5 forward quickly now, to build on the next phase of
6 Advanced Clean Cars and Zero-Emission Vehicle programs to
7 keep us on track to meet our climate goal and realize
8 these tremendous health benefits. And please keep the
9 particulate matter controls on track as staff is
10 recommending.
11 Thank you very much.
12 CHAIR NICHOLS: Thank you.
13 Eileen Tutt.
14 MS. TUTT: Chair Nichols and members of the
15 Board. Good morning. My name is Eileen Tutt. I'm with
16 the California Electric Transportation Coalition.
17 I'm not going to repeat anything that's in our
18 letter. We completely support the staff recommendation
19 specifically regarding the ZEV part of the program. And
20 we're really happy to be working with them throughout the
21 whole process. So we found them to be, as usual, very
22 pleasant and responsive to work with.
23 I do want to just point out something because I
24 didn't see it really highlighted in Anna's presentation;
25 and you'll not be surprised to hear me say this. The ZEV

1 Program is on track and we're glad you're going to keep it
2 on track hopefully. We are -- California is clearly
3 committed to zero-emission vehicles. But probably the
4 number one threat to the continued market acceleration
5 beyond even the rates we're at today is the fact that we
6 just don't have a reliable incentive program in place.
7 And so we really, really need that. And I'm worried about
8 the federal incentives. Actually I'm worried about much
9 more than that. Federal government.
10 (Laughter.)
11 MS. TUTT: But I also -- I just think it ought to
12 be a no-brainer that in California we would have a
13 reliable incentive program. So I just hope that you have
14 not forgotten that, and I'm sure you won't.
15 But I want to say, so thank you for your
16 consideration, and I hope that today turns out the way I
17 think we all hope it will turn out.
18 BOARD MEMBER SPERLING: Can I ask a question?
19 CHAIR NICHOLS: Yes, go head.
20 BOARD MEMBER SPERLING: What do you mean by a
21 reliable incentive structure? What would that be?
22 MS. TUTT: Well, we have a budget proposal. So
23 thank you, Dr. Sperling, for asking that question.
24 (Laughter.)
25 MS. TUTT: I think what we would like to see

1 ideally, not just for light-duty vehicles but for medium-
2 and heavy-duty vehicles, we would like to see 650 million
3 appropriated annually for the next five years either from
4 greenhouse gas reduction fund - so we definitely need to
5 reauthorize cap and trade - and/or through some sort of
6 tax incentive structure. That's our proposal. And I'm --
7 I will actually make sure you get a copy of it.
8 BOARD MEMBER SPERLING: Thank you.
9 CHAIR NICHOLS: Okay.
10 MR. HOUGH: Good morning, Chair Nichols and Board
11 members. I'm Merlyn Hough. I'm director of Lane Regional
12 Air Protection Agency in Lane County, Oregon. Lane County
13 is about the same size as Connecticut. But we --
14 (Laughter.)
15 MR. HOUGH: But we don't have level 2 chargers
16 every 20 minutes yet.
17 (Laughter.)
18 MR. HOUGH: We were formed in -- we're a local
19 air agency formed in 1968 under the Oregon statutes. I
20 won't repeat the written comments since it's really just
21 repeat -- supporting many of the things already said. We
22 strongly support the ARB staff recommendations. We're
23 very encouraged by the midterm evaluation and the midterm
24 review by EPA and the national highway traffic safety
25 folks and Air Resources Board. We're encouraged that

there's even more technologies available for manufacturers to meet the 2022-2025 standards; more than we expected back in 2012 and at similar or lower costs than estimated back there.

I've also provided copies of more detailed comments by the National Association of Clean Air Agencies, so that's in the record. And as already been stated, you know, the ZEV portion of your midterm review is not just important for meeting California's goals but also for the multi-state ZEV Action Plan states, the Section 177 states that's been discussed already.

I'm also a member -- Lane Regional Air Protection Agency's also a member of Drive Oregon, and I could try to respond to that question from earlier. Leah Feldon and Dave Nordberg from Oregon DEQ and I put our heads together. There's so much happening with Drive Oregon. Several initiatives in the Oregon legislature. But we decided you were probably asking about the showcase center that's being planned for downtown Portland. That's part of a $1 million grant from U.S. Department of Energy, a multi-faceted outreach program. But that storefront center is intended to complement the Electric Avenue that's downtown already. There's several quick charging and level 2 stations that are available right down there by the Portland General Electric offices. That's the

other P.G.E. on the West Coast. And that is to provide brand neutral sales folks able to provide ride and drive opportunities and also long-term electric vehicle rental and provide complete and balanced information as a major part of that outreach. So if that was --

CHAIR NICHOLS: That was the question. It was, yes. Thank you.

MR. HOUGH: So thank you for this opportunity. And please keep up all your good work. We're very appreciative of what you have done over the years. You've reduced vehicle emissions and increased fuel economy. It's -- you know, whether you're talking air toxics or ozone precursors or greenhouse gases, transportation emissions are a big deal.

Thank you.

CHAIR NICHOLS: Thank you.

Okay. I was just handed another whole page of people who want to comment, so we'll move along.

MR. SHUMAKER: Good morning, Chair Nichols and members of the Board I am Cory Shumaker, Project Coordinator of the California Hydrogen Business Council, a California industry trade association with a mission to advance commercialization of hydrogen in transportation and stationary applications to reduce greenhouse gases, criteria pollutant emissions and dependence on oil.

1 The California Hydrogen Business Council would
2 like to voice its strong support for continuing
3 California's commitment to bring 1.5 million zero-emission
4 vehicles on California's roads by 2025, supported by
5 strong policies like the ZEV mandate. The CHBC sees
6 California's leadership as essential in accelerating the
7 transition to electric vehicles, including fuel cell
8 electric vehicles, which reduce air pollution and improve
9 public health specifically in disadvantaged communities.
10 The hydrogen and fuel cell community is showing
11 strong economic growth, stimulated by the policy framework
12 developed through California's commitment to clean and
13 emission-free technology for transportation and other
14 industry sectors.
15 The CHBC strongly encourages the Board to look
16 beyond the 2025 standards and start developing policy
17 recommendations especially for zero-emission vehicles and
18 infrastructure support for the post 2025 time frame.
19 Thank you.
20 CHAIR NICHOLS: Okay. Thanks.
21 MS. REYES: Good morning, Chair Nichols and
22 members of the Board. I'm Susana Reyes with L.A. Mayor
23 Eric Garcetti's Sustainability Team.
24 On behalf of the mayor, I am here to thank you
25 and your staff for the wonderful report. And I am here to

1 voice his support for your determination of the
2 appropriateness of the Clean Car Standards Midterm Review.
3 Los Angeles has a long history of some of the
4 greatest air quality challenges in the nation. Yet we
5 have come a long way, due in part to the work of the Air
6 Resources Board, and for that we are thankful. This
7 progress must continue. The mayor is absolutely committed
8 to clean vehicles. He has required that at least 50
9 percent of our annual city fleet procurement be pure
10 battery electric.
11 We have ensured that Los Angeles Department of
12 Water and Power offer generous residential and commercial
13 rebates for its charging stations. There are 1300
14 publicly available charging stations throughout the city,
15 beating our 2017 goal of 1,000. And we have partnered
16 with your agency to launch a new low income EV car share
17 in Los Angeles, and the grant will enable the
18 disadvantaged communities to access clean, pure electric
19 battery cars and to take advantage of 200 charging
20 stations in the pilot areas by the end of this year.
21 But L.A. is not alone in its commitment to clean
22 vehicles. With 29 other mayors across the country, Mayor
23 Garcetti recently issued an EV Request for Information,
24 and this EV RFI demonstrated to OEMs and manufacturers
25 that these 30 cities have over 114,000 vehicles that could

1 be electrified, representing over $10 billion in potential
2 investment in EV sedans, trucks, and vehicles of various
3 types. We have received 37 responses to the RFI so far.
4 And that's a very encouraging sign that we can make this
5 happen.
6 So we applaud the Air Resources Board's efforts
7 to improve air quality and reduce greenhouse gas emissions
8 through increasingly robust clean-car standards that keep
9 California at the forefront of environmental protection
10 and innovation.
11 Thank you for this opportunity.
12 CHAIR NICHOLS: Thank you. Thanks to the city of
13 Los Angeles for all you guys are doing.
14 MS. PHILLIPS: Kathryn Phillips with Sierra Club
15 California.
16 As you can imagine, we're very disappointed by
17 what we're seeing at the federal level; so today, feels
18 very warm and welcoming. And we want to thank for
19 continuing your commitment to clean air and the ZEV
20 Program.
21 One of things that has helped prevent the level
22 of ZEV adoption that everything else points to meeting to
23 happen and that should happen and that could happen is the
24 actions by the automakers and the dealers themselves in
25 their lack of applying best practices in this sales of

1 vehicles.
2 Recently, last spring Sierra Club volunteers --
3 Sierra Club put together a report where we basically did a
4 shopping experiment. And 174 volunteers around the
5 country in the ten ZEV states visited 308 dealerships.
6 And some of the things they found are pretty discouraging.
7 When you consider how much effort has gone into making
8 sure that the technology is right, we still have not been
9 able to rely on the auto dealers and the automakers to
10 work as well together as they need to to sell these
11 vehicles and make them available.
12 Nearly half the time EVs were not prominently
13 displayed or were often hard to find. They were hidden
14 some place on the lot if they were there at all. Sales
15 people failed to mention state and federal incentives, and
16 those can be a big draw for EVs.
17 Some of the cars couldn't be test driven because
18 they weren't charged. That was in 14 percent of the
19 cases. When you're talking about 388 dealerships --
20 rather 308 dealerships, 14 percent is pretty high. Can
21 you imagine going in to drive a gasoline-powered SUV and
22 them saying, "I'm sorry, we don't have any gas in it. You
23 can't try it"?
24 (Laughter.)
25 MS. PHILLIPS: Only half the time sales people

1 told these shoppers how to charge the vehicle while
2 traveling. So they were left with the impression that you
3 either had to stay in your neighborhood or be at a big
4 disadvantage.
5 Another interesting thing is that the dealers
6 themselves had complaints. Sometimes the automakers
7 charge these certification fees. Some automakers don't
8 charge them. But one dealer complained about being
9 charged $50,000 to do -- for a certification fee. So
10 because of that we wouldn't carry EVs.
11 So I think, in conclusion, that the automakers
12 and the auto dealers themselves can do a much better job
13 of making sure that these vehicles sell.
14 Thank you.
15 CHAIR NICHOLS: Thanks.
16 We have -- excuse me, before you speak. We just
17 got one more card in. And I think that's it, we're going
18 to cut off any additional witnesses at this point. We've
19 got a robust discussion here.
20 Thanks.
21 MS. ADAMS: Hi. My name is Kitty Adams. I'm the
22 Executive Director of Adopt a Charger. And I'm grateful
23 that I can be here today to thank CARB for the ZEV
24 mandate. I want to encourage you to continue this work,
25 you know, beyond 2030.

1 And I also wanted to just comment because -- in
2 response to some of the automakers' presentations
3 specifically about range anxiety. I'm on the front lines
4 of trying to sell cars, and I really hear more about lack
5 of appropriate body style than range anxiety. I jokingly
6 say to people when the Ford F-150 comes with a plug, I can
7 retire because these cars are going to sell themselves.
8 So I just want to make sure that we encour -- do
9 everything we can to encourage the automakers to offer
10 zero-emission vehicles across the whole range of their
11 offerings.
12 And also too is really alarming for me to see the
13 presentations from Connecticut and Maryland and
14 Massachusetts and -- where they have -- they're
15 participating but they don't have the cars to sell. So if
16 there's anything California can do to force the issue and
17 make the automakers make these cars available in all 50
18 states, I think that would be a very advantageous
19 direction to move in.
20 Thank you.
21 MS. HOLMES: Good morning. I'm Laurie Holmes,
22 Senior Director of Environmental Policy for Motor and
23 Equipment Manufacturers' Association, or MEMA.
24 MEMA represents more than 1,000 companies --
25 motor vehicle companies that supply motor vehicle

1 companies -- sorry -- 1,000 companies that supply motor
2 vehicle components for use in the original-equipment and
3 aftermarket industries.
4 Motor vehicle suppliers play a significant role
5 in developing innovative materials technologies that
6 improve vehicle performance, fuel efficiency and
7 emissions, and are committed to environmental policies
8 that enable the introduction of new technologies.
9 MEMA supports ARB's continued alignment with the
10 national program by maintaining that deem-to-comply
11 provision allowing for compliance with the adopted EPA
12 greenhouse gas national standards. This deem-to-comply
13 provision is extremely important to the success of the
14 national program.
15 MEMA strongly supports consistent greenhouse gas
16 standards at the state and federal level and urges
17 California to continue to focus on collaborating with EPA
18 and NHTSA on a harmonized true national program. A
19 harmonized national program provides long-term regulatory
20 clarity and certainty that are critical for suppliers to
21 make the necessary long-term business and technology
22 investment decisions.
23 MEMA supports the conclusion of ARB to maintain
24 the phase-in of the 1 milligram per mile PM standards
25 starting in model year 2025. Maintaining that standard

1 provides regulatory certainty necessary for MEMA's members
2 to commit the requisite research and development to assist
3 manufacturers in meeting future regulations cost
4 effectively.
5 As we've also heard in the other comments, MEMA
6 urges ARB to provide further flexibility in the ZEV
7 mandate. So further flexibility for the plug-in hybrids
8 by allowing OEMs to comply with more PHEVs than what is
9 currently allowed in the regulations through model year
10 2025. MEMA believes that PHEVs can serve as the
11 successful transition to ZEV technology by appealing to a
12 broader market, especially under the current market
13 situation.
14 MEMA would also support ARB working with industry
15 to develop an additional test cycle similar to the one
16 described in appendix H to measure PHEV tailpipe criteria
17 emissions more thoroughly. This additional test cycle
18 could then be used to provide additional ZEV Program
19 performance-based credits that incentivize tailpipe
20 criteria emissions controls technology for PHEVs, which
21 would provide incentives that would move the ZEV Program
22 to more fair, balanced, and performance-based driven
23 standards and solutions.
24 Thanks for your time.
25 MR. BOESEL: Good morning, Chairman Nichols and

1 members of the distinguished California Air Resources
2 Board. My name is John Boesel. I'm the President and CEO
3 of CalStart.
4 I want to make clear it's Boesel, not Boesella.
5 (Laughter.)
6 MR. BOESEL: We are a national nonprofit
7 organization working to build the clean transportation
8 technologies industry as a strategy to produce -- provide
9 high quality jobs, improve public health, and prevent
10 global warming. Though our members are working on a wide
11 array of technologies and fuels, they all share a common
12 belief that innovation can solve our challenges.
13 I'm standing here today to strongly endorse the
14 staff recommendations while wishing their was an
15 opportunity to do even more.
16 Looking back to 2012 when the Advanced Clean Car
17 Programs was adopted, it's impressive to see how much
18 progress and innovation has occurred, in large part due to
19 joint policies of the ARB, EPA, NHTSA, and the Section 177
20 states.
21 I want to describe the progress and why we
22 support the staff recommendations with the following four
23 points:
24 First of all, California is now the home to three
25 emerging light-duty electric vehicle manufacturers;

1 Faraday Future, Karma Automotive, and Tesla Motors. These
2 companies are here because California is where the action
3 is and because of ARB's policies. This is also where a
4 lot of great talent is.
5 Tesla is now the largest manufacturer in the
6 State of California, period, end quote -- or stop -- hard
7 stop.
8 (Laughter.)
9 MR. BOESEL: Tesla has 22,000 employees in its
10 combined operation with Solar City in the state of
11 California. There are a lot of other states that would
12 kill for -- to get those job.
13 Charge Point, the nation's largest EV charging
14 company, is also based here in California.
15 California is also home to the U.S. headquarters
16 and operations of BYD, who presently focus on electric
17 buses and trucks in the United States. BYD was the
18 largest manufacturer of electric cars in the world in
19 2016, and submitted a letter yesterday strongly endorsing
20 the staff's recommendations and the ZEV targets.
21 Since 2012, when the program was announced, it's
22 also been very exciting to see how the global automobile
23 industry has moved in mass to Silicon Valley. Not
24 including Tesla or your traditional mechanics and dealer
25 jobs, there are probably 4,000 new jobs related to the

1 automotive industry in the Silicon Valley alone that have
2 occurred since 2012.
3 Secondly, the ZEV technology, the technology has
4 improved incredibly since 2012. We've seen basically the
5 same battery pack in the -- at the same price in 2012 is
6 now -- and you can go from 75 miles to 230 miles in that
7 same pack. I want to give General Motors a lot of credit
8 for what it's done.
9 Also, per -- a study we did on Tier 1
10 suppliers -- shoot.
11 (Laughter.)
12 MR. BOESEL: They are very committed to investing
13 in the future of technology.
14 So let me just wrap it up even though I had a few
15 more points, which I'll submit in writing, is that we see
16 at least four OEMs right now between Faraday Future, BYD,
17 Volkswagen -- or at least three willing to say that they
18 support the standards. And that was something that was
19 very different from 2012.
20 And then some very strong comments by BMW CEO
21 basically saying that by 2025 they see 15 to 25 percent of
22 all sales being electric vehicles, which is basically an
23 endorsement of the standard as well.
24 Thank you very much.
25 MS. KINMAN: Good morning. If only that dolly

1 were as smooth a drive as my EV, I'd be in a good spot
2 this morning.
3 My name is Michelle Kinman, and I'm the clean
4 energy advocate for Environment California Research &
5 Policy Center. And I'm very pleased to present some of
6 the more than 10,000 petitions that Californians all
7 across the state have signed expressing strong support for
8 the ZEV mandate. These petitions were gathered by
9 organizations representing the environmental, public
10 health, scientific, consumer, and faith communities,
11 including the American Lung Association in California, the
12 Coalition for Clean Air, CalPIRG students from UCLA and UC
13 Riverside, California Interfaith Power & Light, Plug In
14 America, Sierra Club California, the Union of Concerned
15 Scientists, Environment California.
16 This diverse set of voices is united behind the
17 following petition statements, quote: Yes, I want more
18 zero-emission vehicles on the road and support strong
19 policies like the ZEV mandate that will lead to at least
20 1.5 million ZEVs on California's roads by 2025. By
21 accelerating the transition to electric vehicles we can
22 clean up our air and improve public health, especially in
23 our most disadvantaged -- or, excuse me -- polluted
24 communities; reduce global warming pollution; save
25 Californians money at the pump; and stimulate economic

1 growth, end quote.
2 I would like to thank the ARB for your long
3 leadership on clean vehicles. Now more than ever, with
4 the administration in DC threatening to put the brakes on
5 cleaner vehicles, your continued leadership is essential,
6 and we urge you to enact more stringent standards now and
7 in post 2025.
8 On a separate but complementary note I would also
9 like to present a letter prepared by my colleagues at
10 Environment America to President Trump and signed by more
11 than 1100 public health professionals nationwide urging
12 the administration to make climate change a top priority,
13 including, quote, ensuring that the U.S. maximizes
14 reductions in automobile pollution and fuel consumption by
15 setting the strongest possible fuel economy and greenhouse
16 gas standards for automobiles, while encouraging policies
17 and incentives for zero-emission vehicles to fully
18 transition our transportation sector to zero carbon
19 pollution, end quote.
20 So I think you can see that you have a lot of
21 different constituencies that have your back on
22 accelerating the transition to a zero-emission vehicle
23 future.
24 Thank you.
25 MS. DRUFFEL: Good morning, Chair Nichols and

1 Board members and ARB staff. I'm here on behalf of the
2 faith community. I am Allis Druffel, and I work with
3 California Interfaith Power & Light. And I am here for
4 the strong recommendation for the ZEV mandate, for it to
5 be kept as strong as possible.
6 I'd also like to say to the auto industry
7 representatives in this room: Thank you so much for your
8 strides in creating fantastic vehicles that clean our air,
9 save money at the pump, and strengthen our economy.
10 And at the same time, to the industry
11 representatives and ARB: Automakers are challenged to
12 continue their excellent process in creating cleaner
13 vehicles. Do not turn back based on temporary low gas
14 prices. We have to remember why we are here right now.
15 We are here because we are in a planetary crisis. People
16 are actually suffering from multiple illnesses and dying.
17 We have 5200 premature deaths in the South Coast air
18 quality alone due to poor air quality. So we're at a crux
19 here when we recognize that the planet is in crisis and
20 that there are far too many people that are sick and dying
21 from pollution sources.
22 So ARB and industry: We need you really badly
23 right now. You have the technology, the know-how, the
24 committed wonderful workers to make a cleaner California
25 and nation happen.

1 And I'd just like to include that Interfaith
2 Power & Light is in 40 states and the District of
3 Columbia, and we are actively advocating to our members
4 about consumer demand for electric vehicles and for the
5 installation of charging stations.
6 And I have 400 more petitions here in this bag,
7 whoever wants it.
8 So --
9 CHAIR NICHOLS: Give them to the clerk please.
10 MS. DRUFFEL: Okay. Great.
11 Thank you so much.
12 MR. LEWIS: Good morning, Chair Nichols and Board
13 members. My name is Mike Lewis. I'm with Pearson Fuels
14 out of San Diego. Some of you may have heard of us. But
15 a real quick rundown.
16 We started, we built a gas station, a fuel
17 station in San Diego back in 2003, 14 years now. And it
18 had a lot of different alternative fuels, first time in a
19 lot of places. We had biodiesel, we had propane for
20 vehicles, two pressures of natural gas, six electric
21 chargers in E85. The first E85 pump on the West Coast in
22 the United States. And that station struggled very badly
23 for -- in fact, it lost money for seven years in a row.
24 And one of the things that kept us going was that several
25 years into that the Air Resources Board came up with a

1 program to promote alternative fuel infrastructure around
2 the state. And we ultimately got I think $1.3 million to
3 build E85 sites around the state. And then we went on to
4 get funding to build a couple biodiesel terminals. We've
5 helped develop a hydrogen station; I have few more in the
6 works. We got some funding from the Air Resources -- or
7 from California Energy Commission to build more E85 sites.
8 And now we have -- we supply 88 E85 stations around the
9 state of California.
10 And it works. We have major gasoline station
11 chains contacting us. We -- to do E85. We -- the public
12 buys a lot of E85. We have a record number of stations,
13 record number of volume sales almost every month. And
14 it's been very successful. We've opened seven this year
15 already. 2017 we've opened seven, including San
16 Bernardino, Fontana, Fresno, Chula Vista. A lot of these
17 locations are in the -- they score highly on EnviroScreen,
18 as they're supposed to with AB 197. And they don't cost
19 any more, the vehicles don't cost any more, so the
20 consumer doesn't have to pay any more for the vehicles and
21 oftentimes saving money on the fuel.
22 And so what I want to recommend to you is that
23 you reconsider in the midterm review the greenhouse gas
24 conclusions. Because obviously, God knows what the feds
25 are going to do, and you don't want to leave it all in

their hands. And I would suggest to you that the state's invested $15 million building E85 sites. And I thought as a gas station owner I was doing what I was supposed to. Because it was my -- the funding that you guys put there initially that kind of kicked it off. And I'm not asking for any more funding. The E85 industry doesn't need any more funding, and the self-sustainable it has about a 20 percent greenhouse gas reduction. And I'd ask you to keep that midterm review open so that flex fuel vehicles could continue to be incentivized or at least not disincentivized.

Thank you for the time.

MR. LEVIN: Good morning. My name is Joe Levin, and I'm the Executive Director of Plug In America. We're the national voice of the EV driver. And I'm here to make sure that the voices of EV drivers in California, in the other ZEV states, and all over the country are heard in today's discussion.

The basic truth is that electric drive is a better way to move cars around and that people love these cars. They like the way they drive. They like the convenience of being fully fueled each morning and never having to go to the gas station. They like not having to think about maintenance. They like keeping their fuel dollars local, instead of sending them half way around the

1 world. And they like keeping their air clean when they
2 drive.
3 People want to buy these cars.
4 The main complaint that we hear about these cars
5 is that the availability is so limited in much of the
6 country. More than 30 models are now available in
7 California. But in many states you can find only a
8 handful of electric vehicles.
9 We've put on dozens of ride-and-drive events
10 around the country. But outside of California we have a
11 chronic problem of finding enough cars for our events.
12 People show up. They want to test drive EVs. And
13 sometimes there are not enough cars for the demand.
14 People wait around and then after 30 or 45 minutes they
15 give up and they go home. So that's another reason we
16 feel very strongly about keeping the ZEV rule strong.
17 I have in my hand here letters from 88 mayors and
18 city council members from most of the major cities in the
19 other ZEV states. Because we have a short time, I won't
20 list all the cities, but there's 88 cities. And I also
21 have letters from 32 different state legislators from all
22 of those states. These have all been submitted already
23 into the record.
24 And these are people that represent literally
25 millions of their constituents that are asking for a

1 stronger ZEV -- a strong ZEV rule that will put more
2 electric vehicles on the streets of their cities and make
3 them more available for their constituents so they can buy
4 or lease them.
5 So I'm happy to make sure that their voices are
6 heard here today. And I want to support the staff
7 recommendations. I hope that you do as well, and make
8 sure that these cars are available for people to purchase
9 everywhere.
10 Thank you.
11 MS. PIERCE: Good morning, Chair Nichols and
12 members of the Board. I'm a member of an EV club, the
13 Electric Vehicle Association of Southern California. When
14 I moved to Orange County from out of state in the late
15 spring 1979, I kept getting lost on the freeways. Friends
16 kept telling me to get my bearings; remember, the
17 mountains are to the north. I kept looking at them.
18 Mountains? What mountains?
19 About eight months later, after some heavy rain,
20 I finally saw the mountains. They were beautiful.
21 The smog was always so bad back then, the
22 mountains were hardly ever visible. Thanks in part to
23 emission restrictions, that is no longer the case.
24 In 1989, I moved to the Inland Empire with my
25 youngest -- when my youngest daughter was less than a year

1 old. I felt a lot of guilt for that move when she
2 developed asthma. We could liter -- from where we lived,
3 we could literally watch as the smog rolled in from L.A.
4 throughout the day.
5 My older girls in school had to forego outside
6 activities on those smog days when the air was deemed
7 unhealthy. It happened a lot when they were younger. But
8 as the years progressed, it happened less frequently.
9 We all know that the Southern California region
10 has some of the worst traffic congestion in the country.
11 The emissions from all that traffic causes so much health
12 problems to everyone. Placing restrictions on emissions
13 reduces the brown air and the health problems.
14 The easiest way to reduce emissions is to
15 drive -- the easiest way to reduce emissions is to drive
16 zero-emission vehicles. The requirements that California
17 has developed over the years to ensure reduced emissions
18 has had a positive effect not only in California, but
19 across the country and even the world. More countries are
20 developing zero-emission vehicle requirements due to the
21 advances in technology developed because what California
22 started.
23 Please do not regress in this fight. If
24 zero-emission policy is abandoned, or emission
25 requirements are relax, the air will once again be brown

every day and overall health of residents will decline. If we lose site of California's zero-emission goals, we will also fall behind in technological advancements that countries like China are developing.

I drive a 2012 Leaf -- Nissan Leaf and it's so fun to drive. It is quiet and fast off from the stop. When I first got my car, there were not a lot of choices. Thanks to all the progressive California rules, there are many zero-emission vehicles available now and more developed all the time. Please keep moving forward. Don't go backwards.

Thank you.

(Applause.)

CHAIR NICHOLS: Thank you.

DR. REICHMUTH: Chair Nichols and members of the Board. My name is David Reichmuth and I'm speaking on behalf of the Union of Concerned Scientists. And thank you for taking the time today to listen to myself and all the other stakeholders that have come here today.

I'd also like to thank staff for their work on the midterm review. It's a comprehensive document. It's technically sound, and it will serve you well as you make this decision on how to proceed with the ZEV regulations.

We support the staff's recommendations in the midterm review to remain -- to keep the Advanced Clean Car

1 Program as is through 2025. We submitted detailed
2 comments on this, so I just want to hit just one or two
3 items to pull out from those comments.
4 Staff recommends making no changes to the ZEV
5 Program in California and the 177 states. We agree. The
6 ZEV Program has been successful in bringing zero-emission
7 vehicles to the state and giving many Californians the
8 option to buy a cleaner and, frankly, better alternative
9 to a gasoline vehicle.
10 Now, in the comments submitted some of the
11 automakers have suggested that changes are needed to the
12 program especially regarding implementation in the 177
13 states. They point to the lower sales in the East Coast
14 177 states as compared to California, showing the
15 inability to sell these ZEVs on the East Coast. This
16 ignores several important factors under the control of
17 automakers, the most important being ZEV model
18 availability and ZEV inventory availability.
19 In part due to the travel provision as we heard
20 from the representative from Massachusetts, some
21 automakers have not sold certain ZEVs on the East Coast.
22 One example is the Fiat 500E BEV, which is available only
23 in California and Oregon, despite the fact that it's sold
24 over 5,000 units here in California the last three years.
25 Other models have substantially lower inventory

1 available. So they're technically available in the 177
2 states on the East Coast, but functionally they're
3 unavailable.
4 We at UCS did a study on this issue. We found
5 that when you looked at the availability in different
6 cities, there are stark differences. In Boston there's
7 about 90 percent fewer ZEVs on average available than in
8 the Oakland Bay Area.
9 And that is includ -- that's -- that holds even
10 when you take into account the differences in vehicle
11 ownership between these cities.
12 Simply put, car buyers can't buy cars that aren't
13 there, and they won't consider those that they can't see
14 and test drive at dealerships.
15 Now, we also agreed that staff -- that ARB should
16 ask staff to begin the process of developing ACC standards
17 for post 2025. We know that we're making progress in
18 reducing emissions, improving air quality. But that
19 progress needs to not just continue, but it needs to
20 accelerate after 2025.
21 California has clear targets for lower emissions,
22 and the ARB should start the work of bringing all
23 stakeholders into the process of designing policies to
24 achieve those goals.
25 Thank you.

1 CHAIR NICHOLS: Thanks.
2 MS. HEARTQUIST: Hello. My name is Christina
3 Heartquist, and I'm speaking today on behalf of Jack
4 Gillis, auto expert and author of the Car Book, and Mark
5 Cooper, Director of Research, both of the Consumer
6 Federation of America, a national association of over 250
7 nonprofit organizations working to advance the interests
8 of American consumers.
9 For consumers, California's Clean Cars Program
10 saves money and strengthens local economies. So the Trump
11 Administration's decision to rescind EPA's final
12 determination on fuel economy standards makes California's
13 clean car leadership more important than ever. The work
14 you do is federalism at its best.
15 California's current standards are anchored in a
16 joint agreement reached by automakers, Washington, and
17 Sacramento; and CFA urges CARB to stay the course.
18 Because 12 other states and the District of Columbia have
19 adopted California's standards, your decision today will
20 affect whether 113 million Americans will be able to buy
21 cleaner cars, save money at the pump, and breathe cleaner
22 air.
23 Most importantly, consumers strongly support what
24 CARB has been able to accomplish. At CFA our polling
25 consistently shows that the overwhelming majority of

1 Americans - Republicans and Democrats - from the nation's
2 heartland to the coasts - supports making cars run on less
3 gas and pollution because it drives savers money -- it
4 saves drivers money.
5 Under the Clean Air Act, California and the other
6 clean car states have the right to set their own standards
7 and protect their own air quality. This is an important
8 right, has been recognized for decades, and has been
9 protecting both lungs and pocketbooks ever since.
10 These 13 states and the District of Columbia
11 represent some of the most vibrant economies in the
12 country. When consumers can spend less on gas, they spend
13 more on local goods and services. This builds the economy
14 and communities across the nation instead of exporting
15 money to out-of-state and foreign oil interests. Clean
16 car standards have generated economic growth in jobs
17 across the nation by spurring the development and
18 manufacture of advanced efficiency technologies, and
19 California's zero-emission vehicle program has driven
20 development of some of the cleanest cars on the planet.
21 For consumers, ZEV makes it possible to disengage
22 entirely from the volatile oil market and avoid stopping
23 at the gas station ever again.
24 Years of analysis and input from automakers,
25 advocates in governments, and other stakeholders have

1 shown that current clean car standards are achievable and
2 cost effective for automakers and consumers. Our work at
3 CFA backs up these findings.
4 We have exhaustively studied the economics of
5 clean cars and there is absolutely no question that from
6 the perspective of individuals, families, and businesses
7 that buy or lease, car owners benefit from the minute they
8 drive off the lot.
9 As we'll clearly demonstrate in our written
10 testimony, robust clean vehicle standards are good for
11 consumers. Without strong state leadership from
12 California and the states that have adopted CARB
13 standards, consumers will be saddled with less efficient,
14 more costly, and greater polluting cars and trucks. With
15 California's leadership, these 113 million Americans will
16 save gas, money, breathe better air, and have access to a
17 broad array of cleaner, more efficient vehicles.
18 On behalf of consumers across America, the
19 Consumer Federation of America urges CARB to stay the
20 course.
21 CHAIR NICHOLS: Thank you.
22 MS. MOELLER: Good morning. My name is Jennifer
23 Moeller, and I come before you today as a mother on behalf
24 of Moms Clean Air Force and a concerned citizen.
25 When it comes to caring for my children from a

1 mother's perspective, there is nothing more important than
2 health and safety. As a mom living in Los Angeles, health
3 issues stemming from air pollution is very concerning.
4 The traffic congestion and smog is a large
5 ongoing problem for many of us moms as we run our kids
6 from one activity to another. In fact, all drivers are
7 impacted by both the heartache and headaches of sitting in
8 traffic for prolonged periods of time and taking in all
9 that unnecessary smog into our lungs.
10 For children, this is especially concerning, as
11 it impacts those young developing lungs and bodies even
12 more. This is why I am here today, to urge you as
13 California's leadership council to act on moving forward
14 with the California Advanced Clean Cars Program, and
15 here's why:
16 California has led the way on clean air policies,
17 making it the first state to develop a regional air
18 pollution control district in 1947 to address the many
19 ongoing crucial and health affecting air quality problems
20 in Los Angeles.
21 Congress subsequently adopted a new provision of
22 the CAA section 177 allowing other states to opt into
23 California's vehicle emission standards, which means a
24 large number of states have opted into California's
25 standards over the years, and since then 12 have opted

1 into our LEV and ZEV standards, overall representing 35
2 percent of cars sold in the U.S.
3 Mainly California's economy has grown
4 simultaneously as the state's leader in harmful-emissions
5 reduction. Of California's 19 areas that once exceeded
6 either the one-hour or original eight-hour ozone
7 standards, only four still exceed those standards today.
8 Even the South Coast and San Joaquin Valley, two
9 areas of the state that face the nation's most critical
10 air quality challenges, have seen significant progress.
11 Clean air progress in California has occurred at
12 the same time the state population has increased by over
13 25 percent and the economy has continued to grow.
14 California is the world's sixth largest economy,
15 and the job growth in the state has outpaced the national
16 rate, all while adopting the nation's most protected air
17 quality policies.
18 I am the mother of three beautiful children under
19 the ages of 6. So when it comes to health and the
20 environment, I can't stress enough how passionate I am
21 about clean air, which means standing for zero-emission
22 vehicles and a Clean Cars Program to support it.
23 This not only benefits our state as a whole but
24 our environment by making a significant cut into our smog,
25 lessening asthmatic resulting health diagnoses in our

1 children, and creating a longer lasting planet for our
2 future. Lets work together to make a difference, not just
3 for us, but for our children.
4 Thank you, Board members, for your time and
5 consideration.
6 CHAIR NICHOLS: Thank you for being here.
7 I'm a fan of yours on social media. I follow
8 you.
9 (Laughter.)
10 CHAIR NICHOLS: Okay. I think we should -- I'm
11 sorry because you just got up here. Maybe we'll want to
12 take one more witness. But we've been going since 8:45.
13 Our court reporter hasn't had a break, and I think we want
14 to continue this item through to the final conclusion
15 before we break for lunch, and then break for lunch.
16 So let's take a 10-minute break, 10-minute break.
17 Will you be okay with that?
18 All right. We'll bring you back up in 10 minutes
19 then. Thank you.
20 (Off record: 11:59 a.m.)
21 (Thereupon a recess was taken.)
22 (On record: to 12:15 p.m.)
23 CHAIR NICHOLS: All right, everybody, please
24 settle down.
25 We want quiet for our witness.

1 Okay.
2 MS. HERZOG: Should I go ahead?
3 CHAIR NICHOLS: Yes, Ms. Herzog, you can go
4 ahead.
5 MS. HERZOG: Thank you.
6 Good afternoon. My name is Megan Herzog. I'm an
7 attorney at the Conservation Law Foundation, or CLF.
8 Founded in 1966, CLF is a member-supported nonprofit that
9 uses law, science, and economics to tackle the
10 environmental problems that threaten New England. We work
11 in five ZEV states - Massachusetts, Vermont, Maine, Rhode
12 Island, and Connecticut.
13 I traveled all the way from Boston to represent a
14 broad coalition of ZEV state environmental advocates and
15 residents who strongly support the ZEV Program. I have
16 here more than 700 letters from people who want more EVs
17 to be sold in New England.
18 I also bring a letter signed by 34 public
19 interest organizations that are actively promoting ZEVs in
20 the northeast and the mid-Atlantic.
21 Our organizations have helped achieve a number of
22 major successes in our states, including rebate and grant
23 programs for EVs, multiple new statutes and utility
24 commission policies, and thriving public education
25 programs.

1 These initiatives and many others are driving
2 increased adoption and awareness of EVs in our region.
3 And we are committed to advocate for further progress, but
4 we need your help.
5 Transportation is our region's single largest
6 source of greenhouse gas emissions. And they are critical
7 to meeting our ambitious climate requirements as the ZEV
8 program. For instance, Massachusetts Global Warming
9 Solutions Act requires emissions reductions of 25 percent
10 below 1990 levels by 2020, and 80 by '50. Vermont is even
11 striving for 95 by '50. Our states may be smaller but we
12 have mighty goals, and we will not submit to false claims
13 by industry. We want to drive electric.
14 Rhode Island, which is roughly the size of
15 Yosemite Park --
16 (Laughter.)
17 MS. HERZOG: -- nonetheless offers $2500 in a
18 rebate for an EV purchase.
19 Connecticut has a population on par with Fresno
20 County, but boasts nearly 350 EV charging stations.
21 And in Massachusetts, which is comparable to the
22 Bay Area, utilities are pursuing $70 million worth of
23 investments in EV infrastructure.
24 Section 177 states are proud to stand with
25 Californians as clean energy leaders, and we thank the

1 Board for all that you've done to advance the EV
2 marketplace in our states.
3 We will continue to defend our states' rights to
4 regulate climate pollution and air quality and to defend
5 public health in our states. And we urge you to move our
6 shared legacy forward and stay firm on your commitment to
7 strong clean car standards for our states.
8 We look forward to continuing to support
9 implementation of the ZEV Program.
10 Thank you.
11 CHAIR NICHOLS: Yes, go ahead, Ms. Riordan.
12 Wait just a second, if you would.
13 BOARD MEMBER RIORDAN: I just have a quick
14 question. And, that is, in your states, do you find it
15 difficult to find an EV to try out and to use? Is that a
16 problem for your states or not? Are they plentiful or
17 not?
18 MR. HERZOG: No, it's absolutely a problem, as I
19 believe you heard from other testifiers before. There
20 have been studies where folks have gone to dealerships in
21 attempts to drive EVs and often they're not charged or
22 they're not available or they're models that just aren't
23 sold in our states.
24 And so I think these letters show that people
25 want more EVs. We'd love to have the option.

1 BOARD MEMBER RIORDAN: Have you followed up at
2 all with the dealers to inquire why more aren't available?
3 MS. HERZOG: We do engage in a lot of dialog with
4 the dealers, and we're continuing to work with them. But
5 I think the ZEV Program regulations and end of "travel"
6 will be essential to getting more cars on our states.
7 BOARD MEMBER RIORDAN: Thank you.
8 MS. HERZOG: Thank you.
9 CHAIR NICHOLS: Supervisor Serna, did you have --
10 oh, no. Sorry.
11 All right. Go ahead.
12 (Laughter.)
13 CHAIR NICHOLS: I wanted to take this moment
14 because I hadn't had a chance earlier to introduce our
15 newest member of our senior executive team at ARB, who
16 happens to be from -- most recently from Massachusetts and
17 from your organization, where she became known nationally
18 as a leader in the environmental justice community. And
19 she is now our assistant executive officer for
20 environmental justice. And she's standing right there to
21 wave to everybody.
22 Veronica Eady.
23 Veronica.
24 (Applause.)
25 CHAIR NICHOLS: Welcome. It's just -- it's

1 really great to have -- Veronica, to have this new
2 position, and to have her here when we're considering
3 these issues which are so important to all of us.
4 So thank you for giving me the opportunity to
5 piggyback.
6 MS. HERZOG: Thank you.
7 MS. SMART: Hi, Chairwoman Nichols and members of
8 the Board and CARB staff. My name is Anne Smart and I'm
9 the Vice President of Public Policy for Charge Point.
10 We're the largest network of EV charging stations in the
11 world. Right now we have more than 18,450 charging ports
12 here in California and 33,000 across the country.
13 I'm here today to congratulate staff on a great
14 report, and continue to support our current path towards
15 2025. For us in the charging station industry, it's
16 really important that we have this regulatory certainty.
17 It helps us know what the projections are going to be for
18 EV sales, helps us size our own investments, helps us
19 figure out range on our technology. It really helps to
20 make sure that we have our own consistent market along
21 with the EVs that are out there.
22 In addition to continuing on the current path, we
23 also want to make sure that we continue to get rid of the
24 "travel" provision for BEVs. For us it is also important
25 that we move forward with getting as many EVs as possible

in the non-California ZEV states. We're doing our part to put infrastructure there, it has been said by several people. But demand for EVs help drives demand for charging stations. And though it is a chicken-and-egg issue, if we can get more cars and dealerships there, we can also get more charging stations in the ground.

Beyond 2025, Charge Point supports creating an additional goal along the lines of what staff recommended. However, we encourage that as this new regulation is developed, that CARB work with automakers, charging infrastructure providers, and other stakeholders to set this goal so that it's both ambitious yet achievable beyond 2025.

Aligned with that we also think it would be important if this state were to set a charging station goal. I have put this in writing a few times now. But I do think that as we are figuring out how much charging infrastructure we need to support these vehicles, that you have a number in mind or at least a goal or a target. I've suggested based on NREL numbers a goal of one public charging station for every five electric vehicles - NREL is the National Renewable Energy Laboratory - that we should have a goal of one public charging station for every five electric vehicles on the road. That would include level 2 and DC fast chargers. Or in order to make

1 sure that our charging stations are located throughout the
2 state, it's not just in coastal areas, perhaps a goal per
3 mile of one charging station every 30 miles might be a
4 more appropriate goal to set.
5 But as we're looking for what happens beyond
6 2025, it would be great to work with CARB to set some sort
7 of charging station goals so that we're all on the same
8 page as to how many charging stations we need and whether
9 or not we're there or falling behind.
10 Lastly, for us we think it's incredibly important
11 that we continue to support ZEV adoption in disadvantaged
12 communities. For the charging station industry, it's
13 really important that we also have vehicles in those
14 communities that we're working to get more investments
15 there. And we look forward to working with CARB to make
16 sure that happens.
17 Thank you.
18 MR. WUNDER: Chair Nichols, members of the Board,
19 my name is Andy Wunder. I'm the manager in CERES
20 California program. CERES is a nonprofit organization
21 advocating for sustainability leadership. We mobilize a
22 network of 39 leading U.S. companies representing over
23 $400 billion in annual revenue. These companies are
24 committed to advocating for the adoption of meaningful
25 energy and climate policy. This group is called BICEP,

1 Business for Innovative Climate and Energy Policy. This
2 group includes many California-based companies such as
3 Levi Strauss, eBay, and Dignity Health.
4 I am here on behalf of BICEP to show business
5 support for Air Resources Board staff recommendations
6 detailed in the summary report for the Advanced Clean Car
7 Review -- Midterm Review.
8 I'd also like to strongly voice BICEP's support
9 for California's authority to adopt and implement its
10 advanced clean car regulations. Regarding greenhouse gas
11 emission standards, we support continuing California's
12 participation in the national program.
13 However, if EPA's greenhouse gas standards are
14 significantly weakened, we urge ARB to assess the need to
15 adopt new stronger standards. Strong standards provide
16 critical reductions in greenhouse gas emissions needed to
17 ensure California meets its 2030 climate goals. Strong
18 standards benefit consumers, businesses, and the economy,
19 as money saved on gas is diverted to consumer spending.
20 And strong standards drive innovation and investments in
21 advanced vehicle technology necessary to keep American
22 companies competitive in the global economy.
23 Regarding California's Zero-emission Vehicle
24 Program, we support staff recommendations to strengthen
25 the ZEV Program post 2025 to ensure the program meets its

1 intended goals. Reaching these goals are key to
2 California's meeting its clean air and climate and public
3 health goals.
4 In addition to reducing environmental public
5 health impacts, a strengthened ZEV Program provides key
6 bottom-line business benefits. The ZEV Program is
7 creating a robust market and reducing ZEV purchase costs
8 for corporate fleets. This helps fleet managers
9 transition to cheaper-to-fuel electric vehicles and avoid
10 petroleum fuel price volatility.
11 Regarding particulate matter emission standards,
12 we support maintaining the stringency of the 1 milligram
13 per mile particulate matter 2025 emissions standard. This
14 drives strong climate health benefits and will ensure
15 healthcare cost savings and increase productivity in
16 California's economy.
17 In summary, BICEP strongly supports ARB staff
18 recommendations to maintain the Advanced Clean Cars
19 Program as outlined.
20 Thank you very much for your time.
21 MR. SHEARS: Good afternoon, Chair Nichols and
22 members of the Board. My name's John Shears. I'm with
23 the Center for Energy Efficiency and Renewable
24 Technologies, here to strongly endorse the recommendations
25 of the staff and to encourage you to accept those

1 recommendations and to move forward.
2 I'm one of the NGO folks who has worked most
3 closely with the El Monte staff. And I want to
4 congratulate and thank the El Monte staff as well as the
5 rest of the crew for the fine work that they've been doing
6 just to keep tabs on things and making sure that we can
7 indeed move forward with this program.
8 I wanted to also sort of step back out of the
9 bubble for a second and take note. I think it was Mr.
10 Bozzella earlier this morning who said that this program's
11 too aggressive. I'd like to remind everyone that in the
12 Arctic this year, the average temperatures were 20 degrees
13 warmer than ever before; in the winter, 20 degrees warmer
14 in the Arctic. There are some climate scientists who are
15 now predicting that the Arctic could end up being ice free
16 year-round. That has serious implications for the global
17 atmospheric wind systems and how they link to the current
18 systems.
19 California's climate is one of the most
20 vulnerable climates to the effects on the planet's winds
21 and ocean currents.
22 This program, which started as California's first
23 climate program is critical to helping us and the rest of
24 the world through California's leadership move forward to
25 deal with climate change. And as we saw yesterday with

1 some of the other provisions that the Board has adopted,
2 California is not just picking on the auto industry.
3 California is doing everything it can to address climate
4 change.
5 Another aspect of all of this of course is -- are
6 the state SIPs. Something else that was considered
7 yesterday. And the work in the vision process that Joshua
8 Cunningham and other folks led up with the CARB staff, if
9 California doesn't move forward with programs like this
10 program, we are at greater and greater risk of not only
11 not being able to address climate change in the way we
12 need to, but also getting into violation of the state SIPs
13 and running afoul of the federal government in that
14 manner.
15 So there's the paradox here of if we pull back on
16 this, we risk running into other violations with the
17 federal regulators.
18 So I encourage you to move forward and to also
19 consider dropping the USO 6 limit based on further
20 development through El Monte.
21 So thanks.
22 DR. JACPOR: Good afternoon, Honorable Chair
23 Nichols and Honorable Board members. My name is Dr. Karen
24 Jacpor, and I'm here today as a representative of the
25 American Lung Association as a doctor for climate health,

1 as a patient, and as a parent here in the Inland Empire.
2 I've been fighting severe asthma and I've been
3 hospitalized or admitted to the emergency room so many
4 times, I have lost count. At least over 40. And so I
5 know firsthand how important it is the work of the clean
6 air programs, and I really applaud the work of the
7 California Air Resources Board.
8 Sometimes I feel like a canary in a coal mine
9 when I notice that my breathing is worse when the air
10 quality index worsens. My daughter is unable to play
11 outdoors about 100 days a year because I can't supervise
12 her outdoors on unhealthful air days.
13 Each year, 15 billion in health and climate
14 damages are caused by passenger vehicles in California,
15 according to the Lung Association report issued last year.
16 But health impacts can be reduced by 80 percent by 2050
17 through strong zero-emission vehicle policies. The bottom
18 line is that zero-emission vehicles can save lives with
19 this 80 percent reduction in health consequences.
20 I am very privileged to show you today that there
21 is broad public health support. I have two letters. This
22 letter represents 300 professionals -- health
23 professionals from across the country; and this letter
24 represents 28 health -- leading health organizations in
25 California. And this -- among these 28 health groups

1 include the California Medical Association, the American
2 Academy of Pediatrics, and the California Academy of
3 Family Physicians, and we're calling for California to
4 keep us on the right path.
5 Our letters states that clean car programs are
6 working as planned to reduce emissions and that the Board
7 should start now to develop the next generation of clean
8 vehicle standards. We believe that California's authority
9 to develop stronger than federal standards is critical to
10 protecting the health of vulnerable communities, including
11 the residents of this region that face high ozone levels.
12 California's standards should be implemented and
13 maintained, and California's authority must be preserved.
14 This is first and foremost a public health issue for all
15 Americans.
16 Thank you for your work on the review, on
17 developing and implementing the programs that I need to
18 breathe today, and so that our kids will grow up in air
19 that won't put them at risk of a permanent lung health
20 deficit for life.
21 Thank you very much.
22 MR. MAGAVERN: I'm Bill Magavern with the
23 Coalition for Clean Air. And I've been working on clean
24 car issues since the late '80s when I was one of Nader's
25 Raiders in Washington D.C. So I've had my share of

1 tangles with the big auto company.
2 But I've also for the last three years been happy
3 to be the owner of a General Motors car, a Chevrolet Volt,
4 which as you know is a breakthrough plug-in hybrid. And I
5 say that because I do believe that the big auto companies
6 can transform themselves and become part of the solution
7 instead of part of the problem and they can be drivers of
8 change and social responsibility.
9 But they're only going to do that if you tell
10 them to, because we've seen historically, whether we're
11 talking about fuel efficiency or catalytic converters or
12 seat belts or airbags, that those innovations get put on
13 the cars when government requires it.
14 And we now have the federal government going in
15 the wrong direction, so it really falls to this body to
16 keep us moving forward.
17 And the auto companies lament a lack of consumer
18 acceptance. But we know that they spend billions of
19 dollars to shake consumer desires. And you've already
20 heard this morning that they're not spending those
21 billions to get people to want to buy ZEVs. And that
22 needs to change.
23 They also need to do a better job of motivating
24 the dealers. And the study by Sierra Club confirms the
25 experience of so many EV shoppers who have found that the

1 dealers are not interested in or not prepared to sell them
2 electric vehicles.
3 This is of course an issue where California plays
4 a really important role nationally because of our unique
5 authority under the Clean Air Act. It's also about
6 protecting the health of Californians.
7 And we support all of the staff recommendations.
8 I want to particularly call attention to the importance of
9 maintaining the particulate matter standards. You have
10 our letter on that. And we also support strengthening
11 that standard over time because, as you've heard, the
12 European Union already has a tighter standard.
13 We also applaud the staff's intent to explore
14 broadening the ZEV standard. And we're particularly
15 interested in the possibility of including heavy-duty
16 vehicles because, as we discussed yesterday, we really
17 need to go zero emission in the heavy-duty sector in order
18 to attain both our air quality and our climate standards.
19 Thank you very much.
20 MS. McGHEE: Good afternoon. My name's Lisa, and
21 I'm with the San Diego Airport Parking Company. And it is
22 a pleasure to be able to see the opportunities that have
23 been a part of clean transportation. And it's kind of
24 perfect that I got to follow Bill because he kind of just
25 allowed me to lead into some opportunities that I wanted

to speak about today.

Moving forward really is about adoption, and relating to SB 350. And we need to drive zero-emission vehicles. And who we are targeting is a big part of how we maybe can accelerate adoption. It's not just about light duty. If you look at your own model in table 15, it shows that your vans and your trucks have no ZEVs. There's actually only one zero-emission van today in the entire nation. I speak to you because that is the type of vehicle that we drive. It's a passenger vehicle. It's also for personal use. So I do think there's a great opportunity to create OEMs -- branded OEMs to help reduce this gap of inventory that simply just isn't available.

I have driven in one-year's time 125,000 miles in a ZEV. So there's a lot of pluses and benefits for a ZEV. And there's also many barriers.

And so adoption is a big part of how we can continue to move the SB 350 forward, and we need inventory to do that.

Airports is what I wanted to talk about. I'm an off airport parking operator. We have 350 shuttle vans in San Diego. We average 50- to 100,000 miles per year. That's 17 million miles in a year. We would gladly find the ZEV use to be exceptional for our type of sector. It's short haul. We're in -- in a controlled environment.

1 So there's a lot of pluses that I think that could be
2 considered when you target how you can accelerate
3 adoption.
4 Moving into efficiencies. We're lacking some
5 standards on efficiency. And what I want to bring up is,
6 what is a kilowatt hour in miles? You know, we don't
7 really have a standard right now. So how are we going to
8 compare fuel regulation standards in ICE vehicles to an
9 electric vehicle? That's an important element that's
10 missing right now. We do not know how many miles is a
11 kilowatt hour, and we're not having any regulation for it.
12 Also considering there's multiple exemptions
13 associated with certification that -- are other things
14 that can be considered when we talk about durability,
15 useful life. There is no requirement for garage services
16 right now for a ZEV OEM. That's created an obstacle for
17 me.
18 And so I would suggest that if we can continue to
19 try to help move the space forward that we have some more
20 regulations to support the space for adoption.
21 Thank you.
22 MS. REINHARDT: Good morning. My name is Alisa
23 Reinhardt and I'm the Director of Regulatory Affairs for
24 the California New Car Dealers Association.
25 California's new car dealers support the findings

of your midterm review. We especially found the CARB staff's discussion around the state of the ZEV market and the current levels of consumer demand very thoughtfully done, and want to reiterate what we said in our written comments to the Board.

We maintain that every new car sold that replaces an older, higher polluting car means cleaner air and safer roads, and our state's dealers are ready and willing to partner with you to help put more zero-emission vehicles and hybrid vehicles on our roads.

Automakers have done a fantastic job introducing a wide variety of exciting new vehicle options in this space. And California dealers will gladly sell any one of these cars to anyone walking into a dealership that is qualified to buy one.

Any stories you may hear to the contrary are anecdotal at best, and are simply not representative of California's dealer body as a whole and are support for your efforts.

Thank you.

REV. KOTEEN: Good afternoon. A fellow Unitarian once wrote in a cartoon that people of a limited intelligence are drawn to meetings like moths to a porch light.

(Laughter.)

1 REV. KOTEEN: He presumed that it was -- that
2 they had a very large bladder-to-brain ratio --
3 (Laughter.)
4 REV. KOTEEN: -- and managed to sit for a long
5 time and wear everybody else out.
6 But after sitting here yesterday for several
7 hours, I decided that it really takes buttocks of steel --
8 (Laughter.)
9 REV. KOTEEN: -- and a very stiff spine. And I
10 therefore honor you for having that capacity.
11 (Laughter.)
12 REV. KOTEEN: I hope your chairs are more
13 comfortable than the ones in the audience.
14 (Laughter.)
15 REV. KOTEEN: When I was thinking about yesterday
16 and today, the phrase that came to mind was from Exodus,
17 and it was about hardening Pharaoh's heart. And it didn't
18 seem fair to me when I read that that God not only
19 punished the Egyptian's but he also hardened Pharaoh's
20 heart so that Pharaoh wouldn't release the Israelites.
21 But I realized, first of all, that I was guilty
22 of what religious liberals always claim of conservatives,
23 which is that I was being guilty of misplaced literalism.
24 But, secondly, it was an acknowledgement that Pharaoh
25 could not be Pharaoh without a hard heart, and he could

1 not be willing to give up his slaves.
2 And we have all become slaves to the fossil fuel
3 industry. Not just you, but me, and everyone else.
4 And I'm wondering when we're going to start
5 treating tailpipes the way we treat cigarettes. I
6 remember when I could smoke anywhere I wanted to,
7 including an airline, and even in some places -- movie
8 theaters and restaurants. You can imagine what effect
9 that secondhand smoke had on people who weren't smoking.
10 And yet right now we still have tailpipes that
11 spew the same kind of poisons. And I'm in support of what
12 you're doing today, but we all need to do more.
13 So yesterday's testimony, particularly by the two
14 members who are physicians, about how painful it was not
15 only to see that -- the testimony people who have already
16 had relatives that are dying, but people who are in the
17 process of dying right now as a consequence of this,
18 brings us to mind that whatever we're doing now, we're
19 called upon to do more.
20 Thank you for your time.
21 MR. SCOTT: Good afternoon, Chair Nichols and
22 Board members. My name is Craig Scott from Toyota's
23 advanced technology group. And I'm proud to tell you
24 today that in the last year Toyota has sold nearly 1500
25 Mirai fuel cell vehicles and we're well on our way to

1 reaching our first milestone of 3,000 by the end of next
2 model year.
3 That said, a meaningful expansion of sales to
4 achieve our shared goal of reduced greenhouse gas
5 emissions in the transportation sector will require
6 growing hydrogen infrastructure both in number and
7 capacity.
8 Because we recognize the importance of helping
9 guide the development of infrastructure, Toyota has taken
10 the unusual step of getting involved by providing both
11 financial and technical assistance, initially by building
12 stations at three University of California locations,
13 followed by helping to start first element in California,
14 and then a network of 12 stations in the Northeast.
15 Finally this year we were proud to participate in
16 the groundbreaking Energy Commission award to Shell, the
17 first network of hydrogen stations in the U.S. to be built
18 by a major energy company.
19 Similar to our vehicle rollout efforts, we
20 believe it is necessary to accelerate the 100 goal from
21 2024 to 2020. Considering the amount of time it takes to
22 site, permit, and build locations, the time is upon us to
23 decide how the State can support a network beyond 100. We
24 currently estimate the need is around 225 sites by 2025,
25 and we must also include the other ZEV states. Reducing

emissions is our shared goal, and to be effective, we need to sell fuel cell vehicles across all locations.

So far in the Northeast the only hydrogen station network project to be funded is the one by Toyota and Air Liquide.

As we move beyond the first 50 funded stations we would continue to request the state's support to improve the allocation of AB 8 funds. Namely, the following are specific requests. Customer needs and preferences must play the primary role in selecting site locations. Both coverage and capacity are of key importance. Three stations in close proximity are needed for a gasoline-like experience. The station capacity must grow by a factor of 3 to 4 times. Local communities and property owners must be incentivized to help drive this effort. Station project applicants must demonstrate control of the site before being awarded funds. And grant awardees need to be incentivized to complete the project within a 12- to 18-month time frame or be subject to funding termination and reassignment.

My last comment for today involves the price of hydrogen at the pump and the very serious and immediate need to find a pathway to reduce it substantially.

In addition to the financial support in developing stations, Toyota has also provided $15,000 in

complimentary fuel to each Mirai customer to show our appreciation, but to also insulate them from the gap in prices. To gain widespread market acceptance, an incentive mechanism to reduce the price and make it closer to gasoline parity is necessary. We believe the cost must fall far below the $11 per kilogram mentioned in the MTR report. And in fact in Japan the target is 8.75, where natural gas as you know is far more expensive than here. We believe a reasonable and achievable target for California is 5.50 to $6 per kilogram.

Toyota remains committed to helping the State and it's stakeholders.

And we thank you for your time today.

MR. EDER: Good afternoon, Board. I'm Harvey Eder. I'm speaking for myself and for the Public Solar Power Coalition.

I want to incorporate into the record here the record from the 2016 AQMP, the environmental document associate economic document. And in that, there's information about equity -- I want to talk to you about solar equity and environmental justice low income people.

There's a -- a book called "The Capital in the 21st Century" about equity by a French economist that's in the record, and saying how inequity in our society is increasing. And there's also discussions that have been

had with the senior staff vis-a-vis the Board that we've participated in. We've proposed 10 million low- and middle-income electric vehicles and another from 250,000 to a million trucks, solar electric either batteries or hydrogen fuel cells.

We're looking at models of -- trying to get equity to low income people as well as just the corporations and whatnot, upper income people that take the tax credits and write-offs. And so we think this is important.

Solar elect -- nothing has been said about where the electric comes from. It's got to come from solar. Fifteen years ago you had folks coming here, said we've got solar electric. Paul Scott, et cetera. And that's -- I mean, you know, it can't be from natural gas, from fossil fuels, or nuke. There's still 600 megawatts of nukes coming from Palo Verde vis-à-vis Edison, and more from some of the local public power here that extend to the power lines.

Anyway, this needs to be looked at. Solar has come down and is coming down. We're looking at robotics, artificial intelligence. There was an article in the Times how they're going to use robots to prune in the Central Valley and up in Napa. And this is -- the difference between regulation and automation -- and this

is -- we got to look at the biggest picture in society and look at what's happening with equity and who's going to own and control these things. And this needs to be done now. We're looking at the public-private partnership.

Also there's the book that was incorporated into the record, "This Changes Everything," by Naomi Klein, with 350. This does change everything. Included in the record is the information on 750 to 800 parts per million CO2 equivalent. We can't just use CO2 anymore.

And anyway, thank you.

MR. WHITE: Madam Chair and Board members. I'm John white. I'm happy to be representing the Center for Energy Efficiency and Renewable Technologies this afternoon and also the Hydrogen Business Council.

Couple of thoughts that come to mind. I was with the Board and in the audience in 1990 when the original ZEV mandate was adopted. And I also go back a little further to when we were discussing the feasibility of the 3-way catalysts. And one of the uniform things we learned is that what we think it's going to cost turns out to not be what it actually costs because we put our minds together we get scale and we work together.

I want to compliment the staff and the Board for, first of all, really good hearing and lots of good contributions. Important technical work that our friends

1 at EDF and ICCT gives us confidence that we can do this.
2 And I think also the fact that the State of
3 California and -- is stepping up with a significant
4 integrated program of incentives for infrastructure as
5 well as to assist in buying the vehicles. Bodes well for
6 our success.
7 But there are dark clouds on the horizon. I'm
8 recalling the original statement on the floor of the
9 United States Senate by Senator George Murphy in 1967
10 articulating the reasons for California to attain its
11 ability to set its own standards. And he said it is
12 because of the extraordinary and compelling problem that
13 has existed and that exists in the State of California
14 that the state has had to make great effort in the past
15 that will undoubtedly be called upon to make even greater
16 efforts in the future to assure that the citizens of the
17 great State of California will have acceptable and clean
18 air.
19 That's still true. There's a lot riding on your
20 continued leadership and moving forward for the health of
21 our citizens. We still have too much nonattainment. We
22 make great progress, but we have much more work to do.
23 So we strongly concur with the recommendation to
24 stay the course in the midterm review. And we also very
25 much agree with the need to begin now to lay the

1 foundation for the next set of standards from 2026 to
2 2030; because it's at that point that we look like we're
3 going to be close to the crossover point where the EVs are
4 going to be cheaper than conventional vehicles and are
5 going to be a favorite choice. But we've got to sort of
6 seed that market and continue with the progress.
7 And I'd also like to urge our friends in the auto
8 industry to think twice about betting on the Trump
9 Administration as their future. You know, one of the
10 things we've wanted all these years is to have stability,
11 to have predictability. Your process has done that. The
12 administration seems prepared to throw a monkey wrench
13 into that process. But I think we're going to be here
14 longer than they are. And I think the auto industry would
15 be well advised not to bet against the State of California
16 when we have done so much together with them to accelerate
17 the progress of the technology.
18 Thank you very much.
19 CHAIR NICHOLS: Thank you. And you were the last
20 witness on our list. So I'm going to close off the public
21 testimony portion and move into some discussion on the
22 part of the Board. And I know a number of my fellow Board
23 members are going to want to have comments on this item.
24 But I'm going to do something that I don't
25 usually do, which is to start the conversation rather than

1 try to wait till the end.
2 So first of all, I want to say that I think it's
3 quite clear that the Air Resources Board is going to
4 affirm the technical reviews that were done by our own
5 NEPA staff as well as the work of a number of independent
6 analysts.
7 I want to make it clear that we invite the global
8 industry to bring us their best cars and trucks and to
9 take advantage of the willingness of our leaders. Not
10 just of the officials, but from all of the groups that
11 you've heard from here that want to work to provide a
12 range of incentives to make these vehicles affordable. We
13 understand that you are in business to make money. And we
14 don't want to interfere with that to any extent more than
15 we absolutely have to to help you help us get the vehicles
16 that we need.
17 We invite you to come and sit down with us, if
18 you have specific concerns about the implementation of the
19 existing regulations that can be addressed without
20 weakening the overall impact, which is what I've heard the
21 leaders of your associations say is what you wanted to do.
22 We want the cleaner cars that will save consumers
23 money and are fun to drive, because that's what we do in
24 California.
25 Now, I also want to turn to the industry

1 representatives who are here, and those who are not here
2 but are based in Washington, to say, what were you
3 thinking? What were you thinking when you threw
4 yourselves upon the mercy of the Trump Administration to
5 try to solve your problems? It just does not make sense.
6 And when we hear today that you didn't really mean to
7 question the validity of the California waiver, well, our
8 newly confirmed head of the Environmental Protection
9 Agency said he was prepared to do just that.
10 What did you mean when you said you didn't want
11 to question the overall thrust of the standards? Why do
12 another review if the current program is basically okay?
13 And if there were changes that needed to be made again on
14 the implementation side, bring them forward and have the
15 discussion. We invite you to do that.
16 So that's my opening here for the rest of the
17 Board to chime in. I'm sure people will have other things
18 they wish to say. But I just want to make it clear that
19 the outpouring of support that we have here today is not
20 just unique to California. You've heard from a number of
21 representatives of major state agencies that have also
22 come to be with us. And I hear from consumers and from
23 activists all over the country as well as all over the
24 world who want to be part of the move to a successful
25 zero-emission vehicle market.

1 So let's take action today on the resolution and
2 then let's move on.
3 So, Dr. Sperling, would you care to comment next.
4 BOARD MEMBER SPERLING: I'll follow Chair
5 Nichols' lead on this.
6 I will say, first of all - backing up just a
7 little bit - is the staff did do an extraordinary job. I
8 mean, that was an extraordinarily sophisticated, careful,
9 quantitative analysis of the situation, both for the ZEVs
10 and for the greenhouse gas standards.
11 And I also want to note that this -- I've been
12 particularly impressed with the speakers today. It must
13 have been probably -- well, probably a quarter or a third
14 nailed it exactly at three minutes and did it in a very
15 articulate way. I mean, I think this has been the best
16 group of speakers we've ever had in terms of being
17 articulate and getting the time.
18 Okay. So getting back to the point at hand.
19 You know, the greenhouse -- so let me just delve
20 a little more deeply into this.
21 So the greenhouse gas standard, all of the
22 evidence, all of the analysis, call it science, call it
23 economics, shows that, if anything, these standards should
24 be even more aggressive. And that's because every single
25 study shows that there's more savings than there is cost,

1 with discounted appropriately and so on. I mean, think
2 about it for a minute. That means this is one of the best
3 regulations or policies anyone has ever adopted. What
4 we're saying is that this saves consumers money, it saves
5 economy -- the economy money. Forget about greenhouse
6 gases, forget about air pollution. It's great before you
7 even -- and then if you add those on, I mean it's even
8 better.
9 So to get back to the -- you know, the Washington
10 D.C. story, you go there, and I don't see any way where
11 the evidence can be shown that the standard should be
12 weakened in any way.
13 Now, I understand the industry wanted -- you
14 know, was concerned about some of the details of it, the
15 alignment and flexibility. And I actually agree they had
16 good points on that. How they got themselves into the
17 situation where they are now is probably, you know, not in
18 anyone's best interest. But being that what it is, you
19 know, I agree, there's some changes that should be made.
20 You know, one of them that really irks me that I'd like to
21 see change is that electric vehicles lose all of their
22 multiplier credit and, not only that, but upstream
23 emissions are assigned to it. And I'm not sure exactly
24 how that's going to be done, because if you take the
25 average for the country, you know, in some places the grid

1 emissions are pretty high.
2 And so that takes away much of the motivation
3 certainly from a regulatory perspective for the car
4 industry to be investing in electric vehicles. So it's
5 moving us in the wrong direction, and the industry itself
6 would agree with that.
7 And so, you know, I'm not the politician so I
8 don't know how this is played -- going to play out. But
9 certainly I know California is going to take a very strong
10 position that, you know, if anything is done, that's fine
11 as long as it's more stringent in fixing some of these.
12 So that's the greenhouse gas story.
13 And then the ZEV story, which is to -- the
14 greenhouse gas one, it's so straightforward and obvious,
15 it's like, you know, okay, that's easy. The ZEV story is
16 perhaps a little more complicated. In many ways -- and
17 not only in many ways. I would say the ZEV mandate has
18 been the most important, most effective policy in the
19 world to accelerate advanced technology, advanced electric
20 drive technology.
21 And we're starting to see that. Okay, you know,
22 it took a while. There were some blips along the way and
23 it had a tortured life for many years. But it played a
24 really important role. It sent a signal that was, you
25 know, important to the industry, to battery makers and so

1 on, and we're seeing that now. We see great tech -- you
2 know, the car -- the car companies have done a great job.
3 The car technology is very impressive. It's getting
4 better and better. I've driven and owned many of them.
5 The battery costs are coming down quickly, much faster
6 than almost anyone expected. But to go back to what John
7 White was saying, when we as a society, economy, and
8 people focus our resources and our attention on something,
9 it's amazing what we can do. And that's what's happening
10 with batteries. And the same thing, you know, as we gear
11 up with fuel cells, we're going to see the same thing with
12 fuel cells, for sure.
13 I would say -- having said that, we are not
14 alone. And this is actually a good story. China has
15 soared past us in terms of number of vehicles. They sold
16 500,000 electric vehicles last year, way more than the
17 U.S. did. Over 300,000 cars, a hundred thousand electric
18 buses, 50,000 electric trucks -- heavy-duty trucks.
19 Norway has over 30 percent market share for
20 electric vehicles. 30 percent. You know, we're at 3
21 percent.
22 So this really is an important policy. Now, the
23 point of this policy though, before I get into some more
24 of the details is, the point of this policy is
25 commercialization, to advance the commercialization of

electric vehicles, of zero-emission vehicles, plug-in hybrids, fuel cells. It's not to reduce air quality -- reduce pollution. It's not to reduce greenhouse gases. Yes, we want those benefits along the way. But those benefits are so tiny at the market shares we're talking about, that the point of this is to accelerate commercialization.

So as we think -- go forward, certainly past 2025, as many people have said, there's lots of reasons and lots of motivations to really ramp up the number of zero-emission vehicles, and we need to be committed to doing that. A regulation by itself can't do that.

So as the staff has indicated, as we've heard from other people, we need a lot more focus on incentives, and we have to make those certain, we have to create more of a certainty in them. They should be at point of sale like it was either New York or Connecticut said they're doing. We need better marketing. We need better -- more infrastructure, both hydrogen and electricity.

And the pricing -- electricity pricing. You know, in California we have these tiered rates in most cases. And that means if you add an electric vehicle to it -- you know, to your household, you actually would pay more unless you had some special electric vehicle rates or time-of-use rates.

1 Now, we're making progress on all of these. The
2 PUC is working on the prices. We are funding more
3 infrastructure. But we've got to do it more and better.
4 And I think that, you know -- Chairwoman Nichols has
5 emphasized this in the past. And I think -- you know,
6 we've got to figure out how to double down on all of
7 those. The PEP collaborative is working. And marketing,
8 I would note also, which is important.
9 Okay. So what does all this mean in terms of any
10 changes on the ZEV side? There is one thing that I feel
11 strongly about, a change that I would like to see. And
12 that is -- it's not a change. It's an extension. And
13 that is what's been known as the transportation system
14 credits. And this is something that right now it -- it
15 was snuck through in 2012. That's not a technical word.
16 (Laughter.)
17 BOARD MEMBER SPERLING: And I didn't notice it.
18 I didn't realize it. And, you know, it's scheduled to be
19 phased out at the end of this year. I think that's a huge
20 mistake, because we're talking about -- as we talk about
21 complementary measures in marketing, this is one of the
22 cheapest, easiest ways to do that. Because what it's
23 going to do is it's a way of getting more of the electric
24 vehicles, the ZEVs into car sharing, into some of the new
25 mobility services out there. And what we've -- if there's

1 anything we've learned is people need to have the
2 experience with these vehicles before they buy them. And
3 we've seen -- we've had market research funded by ARB and
4 others that have shown that the knowledge and awareness of
5 electric vehicles is remarkably low, even for people that
6 are buying new cars. And it's really shocking, you know,
7 when you look at, you know, some of those findings.
8 So this is something that does it easy and cheap.
9 And so I would really argue for an extension of that going
10 forward.
11 The other thing I wouldn't argue with quite so
12 strongly but I believe strongly is -- and especially going
13 forward, is with plug-in hybrids, creating more
14 flexibility. The point -- and certainly 2026 and beyond.
15 We -- the point of the ZEV mandate is to get vehicles out
16 there, to get the industry investing in them and the
17 technology. And we don't -- you know, we're not brilliant
18 enough to know exactly how this is going to play out. And
19 the 177 states especially, they have different markets
20 than us; and we understand that even less well than we do
21 the California market.
22 So I would put that on the table as something to
23 think about. You know, I know there's the, you know,
24 waiver issues and so on. But if there's some way to do
25 that certainly for 2026 and beyond, we need to create more

flexibility.

CHAIR NICHOLS: Are you not worried about the cold start problem?

BOARD MEMBER SPERLING: The cold start problem I think is overstated in the sense that if we have, say -- if the plug-in hybrids are, say, 6 percent of the market sales in 2025, and -- the plug-in hybrids are, say, 5 or 6 percent, and that would mean they're like 1 or 2 percent of the total market -- and now we're talking about a tiny part of 1 percent. So through 2025, no. I don't think that's a big issue. Beyond it, yes. But we are -- I hope we are adopting new test procedures that will make sure that there will not be any of those, that we fix that. I see that as a temporary problem and that we should be focusing on getting more vehicles out there and commercializing them.

CHAIR NICHOLS: Okay. Dr. Balmes, you're next.

BOARD MEMBER BALMES: Thank you, Chair Nichols.

Well, I'm going to sort of get down into the weeds a little bit more. I brought up earlier Tom Cackette's Jetta Diesel. I turned mine in and bought Chevy Volt, and I want to talk about my experience, you know, buying that vehicle.

I went to a local East Bay Chevy dealer where the vehicles were prominently displayed. You first came on to

1 the lot, there were several right next to a Stingray, you
2 know, and they sort of caught attention, looked good.
3 They were clean. They were ready to go.
4 Actually the one that I drove was a fancy one
5 with every available option. And because I was getting a
6 good deal for a Volkswagen, my wife let me buy the fancy
7 one with the Bose stereo.
8 (Laughter.)
9 BOARD MEMBER BALMES: It's fun to drive. I
10 bought it in November. I still haven't finished the
11 original gas tank. I have a half a tank left. And
12 there's no reason that these vehicles can't be marketed
13 effectively.
14 That was an example of a, you know, California
15 dealership, but, you know, you can do this in 177 states.
16 And I don't watch much TV, but I'm a big Warriors
17 fan and I watch Warriors games. And do I see
18 advertisements for plug-in hybrids or battery electric
19 vehicles? No, I see ad after ad for Silverados, F-150s,
20 and Ram trucks. I mean, the industry talks about there's
21 no market for these vehicles. Well, you create market.
22 You put millions of dollars into advertising. You say the
23 public doesn't want to buy these vehicles, but you don't
24 try to sell it to them.
25 And, you know, I can only add my support to what

1 Chair Nichols said about, you know, I don't know where you
2 guys are going - and I'm talking to the auto industry
3 here. For the last few years I've been telling -- I've
4 been listening to how you're cooperating with us, trying
5 to move ahead, trying to help us meet our both air quality
6 and greenhouse gas climate change goals. I don't know.
7 You have to work with us to achieve those goals, not work
8 against us.
9 I want to say also that I want to endorse the
10 issue about a reliable ZEV incentive program. I wish our
11 legislators were here today. They were here yesterday. I
12 think that at least Assemblyperson Garcia's staff person
13 is here. Please take the message back to your assemblyman
14 that we need to have a stable ZEV incentive program if we
15 want the public to continue to buy the cars in the numbers
16 that we need to have them do so.
17 I have a specific question to staff. It's an
18 informational question. The MECA representative asked
19 about a -- had a proposal for a voluntary GHG credit
20 related to -- well, a credit for a voluntary use of a gas
21 particle filter. I just would like staff to comment about
22 that. I'll pause for a second, if anybody can do that.
23 DEPUTY EXECUTIVE OFFICER AYALA: Dr. Balmes, I'd
24 be happy to do that.
25 The proposal that MECA has made, we find it to be

1 reasonable, so we are committed to working with them and
2 trying to figure out what is the right mechanism to try to
3 promote the deployment of the technology. We agree the
4 technology is a good solution. It's not the only
5 solution. So we're in a good place.
6 BOARD MEMBER BALMES: Okay. Well, thank you.
7 And my last point is also directed towards staff.
8 Dr. Sperling doesn't often say that staff
9 presentations are sophisticated.
10 (Laughter.)
11 BOARD MEMBER BALMES: And he -- I want to support
12 his compliment. I really thought that the presentation
13 today was outstanding, and -- I'm even getting choked up
14 here -- because, you know, this agency has proposed and
15 has implemented important zero-emission vehicle and fuel
16 economy standards that are impacting the world, and it's
17 been supported by solid work of our staff.
18 And, you know, the public support for what our
19 staff has proposed I think is proof of the worth of the
20 work.
21 Thank you.
22 CHAIR NICHOLS: Thank you.
23 Ms. Mitchell, you're next.
24 BOARD MEMBER MITCHELL: Thank you.
25 One thing I think we can start with is that this

1 program has shown remarkable progress. It began in 2012.
2 We're only five years into this program and we -- this has
3 just been amazing where we are today, which also leads to
4 a conclusion then in the next five years it could be even
5 more amazing.
6 And I expect we will see some very dramatic
7 changes in the transportation industry as we go forward.
8 And I think that the work of this agency has really been
9 the catalyst to get where we are now.
10 With that, I also want to express a really strong
11 support for our Northeast states. While this program has
12 been successful in California, we need it to be successful
13 across the nation. And the Northeast states in the
14 Section 177 program is a pathway to get there.
15 Those of us who are on the Board, we get your
16 comment letters. And one thing I want to remark on is we
17 got 700 letters from residents in the Northeast states all
18 asking for these electric vehicle cars. And these were
19 just people off the street. They weren't people in the
20 industry. It was 700 people who bothered to write us a
21 letter asking for electric vehicles. And that should be a
22 message to our dealers and our OEMs that, you know, there
23 is a demand for these cars. In fact, in conversations
24 with Tesla, I learned that their best market is the
25 Northeast state. And they've solved some of the problems

with cold start. And we also know that Northeast states want all-wheel or 4-wheel vehicles because they have weather patterns that demand that. So OEMs should be looking at that as their future manufacturing goal.

So some of things that came out of the testimony that I think we should be looking at is charging stations. Obviously we need infrastructure both for EVs and for hydrogen. And I think that should be something that we look at post 2025. And it was mentioned that perhaps we should have a goal for the number of charging stations. So that's something I think our staff could study.

Another thing that we need to be thinking about is that we need to have more EVs in clean vehicles that are shuttle vans, that are light-duty trucks, that are the SUVs, because this is what's happening to our market: People are buying these things with low gas prices, but also because that's what's available. We don't have EVs -- or many EVs in that category. I know we're moving in that direction. But if there's a way that we can stimulate that production, that would be good. And also that's a note for the OEMs that are out there.

I think the other thing post 2025 is we need to look at the credits in the market, both for EVs and for plug-in hybrids.

There -- we know that there is -- some of that

has been a little bit skewed because we had advanced faster than we thought, we got better range vehicles much faster than we thought, and that credit market has been kind of slanted because of some of the advancements that we didn't expect. So that's one thing we should be reviewing.

It was also mentioned that the PM standard of 1 milligram per mile can be even better. It can be 0.5 as I understood it from the testimony. So let's take a look at that too and study it as a possible goal for future.

Again, I want to echo what has been already said about a reliable incentive program. That's really important in these early stages, to get that incentive program going so that we move past early adopters and increase this market. It could be rebates. It could be stickers for the HOV lanes. It could be tax credits. And there's probably some other innovative things we could think of that would stimulate the market.

I also think as we look at post 2025, let's look at the global market and compare ourselves against what is happening globally. It was mentioned that -- I think Dr. Sperling said 500,000 sales of EVs in China. And I think we should be comparing ourselves against that market so that we're at least trying to move in that direction. And OEMs should pay attention to that too. The market is

1 global. It's not just California and a few states in the
2 United States.
3 And finally, I think we need to be looking at
4 what is the transformative things that are happening in
5 transportation:
6 Car sharing like Uber and Lyft. And some of
7 those are very involved in first and last mile.
8 The other thing is autonomous cars. I once heard
9 a presentation where someone said the worst thing that
10 could happen to us is autonomous cars, because now you'll
11 have a bunch of cars running around with nobody in them.
12 And that is not good for our congestion problem.
13 But autonomous cars that are zero emission is an
14 opportunity. And so that is an area I think we should be
15 looking at. I don't know exactly how we attack it. But I
16 think that we should be taking into consideration these
17 kinds of new things that are happening in transportation.
18 Thank you.
19 CHAIR NICHOLS: Okay. Next I have Dr. Sherriffs
20 and then Supervisor Serna.
21 BOARD MEMBER SHERRIFFS: Thank you very much.
22 One advantage of being way down on the end here,
23 I've got my own camera.
24 (Laughter.)
25 BOARD MEMBER SHERRIFFS: So I had to say

1 something. You know, use the technology.
2 This has been a remarkable morning and early
3 afternoon. Thinking about what is success. And there has
4 been so much success in this process. Really remarkable
5 and really wonderful to be part of all of the energy
6 that's here, and really grateful to people who have come
7 from far to testify and support the work and help advance
8 what's -- what we're working on.
9 You know, really, well, why do we have advanced
10 clean cars? Well, in fact it is to decrease greenhouse
11 gases and to improve air quality. And it's been
12 remarkable the success that this program has had in terms
13 of, as has been pointing out, advancing technology and
14 commercialization of the technology.
15 We pick a lot on the manufacturers and the
16 dealers in terms of supporting this moving forward. And
17 we all have our stories. And I could talk about what it
18 took to get the battery replaced in my car. I will say
19 and -- for the manufacturer, that was great. They stood
20 behind it. But I had to take the car to the dealer three
21 times and point out to the repair person which was the
22 dial we needed to be looking at that indicated there was a
23 problem with the battery.
24 But maybe this will take care of itself, because
25 we look at the global market and we see the sales in China

1 and we see 30 percent of new cars in Norway. Although we
2 had heard that these things don't work in cold climates.
3 And the last time I looked, Norway was still pretty cold.
4 So maybe this problem will take care of itself.
5 But, you know, we were called earlier. And we
6 all recognize, this really is just the beginning. We're
7 always called to do more. This is great success, but it's
8 just moving forward; and we certainly need to be engaging
9 in that process, looking to 2026 beyond. Because we think
10 about incentives, well, one of the great incentives for
11 the manufacturers is having a clear path forward. That we
12 think hard and long and get it right so that it is an
13 appropriate pathway and a pathway that is going to work
14 and can be counted on.
15 Incentives, so important in terms of developing
16 our infrastructure. It's wonderful to hear how successful
17 places like Connecticut have been.
18 You know, this is so important for air quality
19 for the valley. Every zero-emission vehicle in the
20 valley, boy, that is huge in terms of us trying to get to
21 our PM2.5 and our ozone. But, again, the valley presents
22 its own challenges in terms of being a relatively rural,
23 having the corridors in terms of freight so important to
24 the State's economy. But also reminding us as we look at
25 2026 and beyond, boy, we really need to broaden this, we

need to do so much more to bring heavy-duty trucks into this, to help the manufacturers move forward with more options in terms of vans, airport shuttles, those types of things.

And pickup trucks. I have lots of farming friends in the valley who say, "100 miles, that'll work for me. But there's no pickup option that's going to get me around my ranch today." And I know for myself, confession: I have a pickup truck. My wife wants me to get rid of it. It could be our electric vehicle, and that would satisfy me.

But it's not an option, yet. So I'm looking forward to the future and looking forward to continuing to work 2026 and beyond. And the sooner we start that, the better.

CHAIR NICHOLS: Supervisor Serna and then Mr. De La Torre.

BOARD MEMBER SERNA: Thank you, Chair Nichols. So Dr. Sherriffs just stole a little bit of what I was going to say. I have a number of things I want to comment on. But I too have a pickup truck. And, you know, it's an aluminum body, F-150, so it's light weight.

But it does occur to me and it sounds like others on this Board that that's certainly a part of the market that has not been exploited in the kind of way that we

1 want in terms of advancing battery electric and plug-in
2 hybrids for the purpose of hauling and towing in some
3 cases. And I think that is certainly something that I'd
4 be looking forward to seeing the chart next time that has
5 the pickup truck icon on the chart. So...
6 One of the things that stood out to me today in
7 terms of the testimony was something Bill Magavern said.
8 And I'm not sure if he's still here or not. But, you
9 know, he reminded us that we are here to essentially
10 make -- in this case make the OEMs meet the market. And I
11 think that is something not to be taken lightly. I mean,
12 as regulators and certainly as some of us are elected
13 officials, sometimes that makes you wince a little bit.
14 But I think in this case that's certainly the best way to
15 think about our role in this, is to interject what we need
16 to see happen here in not just the California market but
17 certainly assisting, as has been noted today, other states
18 in terms of expanding the market for ZEVs in particular.
19 I think what Dr. Sperling said earlier really
20 resonated with me, and I presume others, about, you know,
21 just exposing consumers to the experience is something
22 that I think is absolutely critical. And what I haven't
23 heard, and maybe there's someone that can correct me if
24 I'm misstating this, but it seems to me that there are all
25 kinds of opportunities to do that. For instance, just

1 getting here to this meeting the last two days, we had to
2 rent -- a number of us had to rent cars at the airport.
3 And just kind of wondered out loud whether or not any of
4 the rental car agencies are looking at programs that could
5 expose consumers on a -- obviously on a limited time basis
6 to the experience of driving ZEVs or plug-in hybrids or
7 other types of model vehicles that aren't just based on
8 ICE propulsion. So I think that's an option.
9 I think, you know, the dealers when they have
10 loaners -- when they give loaners to their buyers that are
11 having their vehicle serviced, that's another opportunity
12 to expose the market for a limited time and get people
13 thinking, getting consumers thinking about the ben -- not
14 just the environmental benefits of driving something other
15 than an ICE engine vehicle but the quietness, as someone
16 mentioned, of driving a battery electric.
17 These are all the kind of creative things that I
18 haven't heard yet - and again correct me if I'm wrong -
19 that I think ought to be -- ought to be exploited.
20 And lastly, I think certainly the need to expand
21 our infrastructure has everything to do with the
22 ability -- overall ability to see expansion in the market.
23 I had a visit from someone here that -- in
24 California that is in the business of mobile solar
25 charging stations for plug-in vehicles. I think it's

ingenious. These things are -- basically you drop them down and they're ready to go. They charge themselves. Those of us that serve up here in local government capacities I think have a responsibility to seriously look at technologies like that that are relatively easy. You don't have to have an open trench scenario that's costly and disruptive. You can literally just have these things dropped in parking lots. And there's even a model of this portable charging station, if you will, that can be adapted for street use.

So those are the kinds of things in the menu of kind of creative thinking to expand the market that I think we're going to have to see more of.

And then I'll just end by again thanking staff. I think, as was noted earlier, you've just done a yeoman's job of really providing not just this Board but the public with I think some very clear challenges that we have still but certainly all the complementary policy directives that we need to see the market expand.

Thank you.

BOARD MEMBER SHERRIFFS: The Fowler Library has a solar charging station. It's wonderful.

BOARD MEMBER DE LA TORRE: Thank you.

When I came on the Board, one of the -- the first big thing that I faced was that deal in 2012. I came late

2011. And I was getting lobbied by many of the people in this room about that deal. And there were so many unknowns around that deal. This Board had a really hard time trying to anticipate what was going to happen. And we all took that leap of faith.

And so here we are doing our midterm review, which was part of the deal back then. So we are following through. We've done the analysis. And we are going to vote in a little bit on this. But I can't think -- you know, I'm trying to think back to 2012. And I can't think of anything in this situation that we're in in 2017 that goes against what we sought out in 2012. I can't think of anything that went wrong in these intervening years. I can't think of anything that is shaky or scary today that we didn't know back then. It's turned out pretty damn well.

And so when you do a midterm review it's -- in my mind, it's an off-ramp possibility. Well, there is no damn off-ramp. We're doing exactly what we said we were going to do. You're doing exactly what you said you were going to do. In a couple of years we're going to have double the number of electric vehicles on the streets or being offered for sale, which I think is going to really kick in the market with more variety. Some of you have heard me talk about some of the electric vehicles that I

1 think that are less than attractive.
2 (Laughter.)
3 BOARD MEMBER DE LA TORRE: I think that's going
4 to change, because there's going to be so many more
5 options - cool options, big options, small options,
6 different options. 200-mile options. That was not
7 something we were talking about in 2012.
8 Maybe Dan was.
9 (Laughter.)
10 BOARD MEMBER DE LA TORRE: So, I mean, here we
11 are in the middle of this thing -- well, not quite the
12 middle but where we proposed we were going to check this
13 thing out, and it's all working. So why would we take the
14 off-ramp? Because something has happened in Washington
15 D.C.? And I can appreciate how hard it is for the OEMs.
16 It's like being between two bickering parents. Right?
17 (Laughter.)
18 BOARD MEMBER DE LA TORRE: And we're the cool
19 one, by the way.
20 (Laughter.)
21 BOARD MEMBER DE LA TORRE: I can understand. I
22 can appreciate how difficult that is. I can understand
23 that on the one hand you have environmental measures, that
24 is our purview; and on the other hand you might have, say,
25 manufacturing incentives or tariffs that might be

1 implemented on imports. I get it. It's tough.
2 But, I'm going to paraphrase a conversation I had
3 with one of your associations, after the other association
4 sent a letter to the Trump Administration saying you
5 wanted to roll back some of this stuff. And that was that
6 you take a long-term global view of the marketplace: That
7 there is a world marketplace; that there is a United
8 States marketplace; and there's a California marketplace,
9 and those are all woven together. And that you need to do
10 product development over the long term and you need to
11 develop products with an eye toward where that global
12 marketplace is going, to Dan's point about sales in other
13 countries. And you're doing that. You've been doing that
14 for a few years now.
15 So, whether it's four years or eight years, why
16 would you change for U.S. market or for the California
17 market when there's a world market out there that is
18 heading in this direction? And I would argue that the
19 California market and the world market are exactly on the
20 same page regardless of what's going on in Washington D.C.
21 So from a business standpoint of the biggest
22 market and the longer term direction, this is the right
23 way to go to stay on track here. So if a divorce is going
24 to happen at some point, we are going to litigate that
25 divorce strongly.

1 And I think the point that was made from the VW
2 settlement earlier - right? - that there were 500,000 of
3 these cars here in the United States, but 8 million of
4 them in Europe. That should tell you what I'm saying
5 here, that I don't -- I'm not making this stuff up. We
6 are just a little piece of the pie, even the United
7 States. I know it's hard for us to not be, you know, the
8 greatest all the time.
9 (Laughter.)
10 BOARD MEMBER DE LA TORRE: And then in terms of
11 what's going on in Washington, I would just point out, you
12 know, within the first hundred days we've had that
13 spectacular success of the travel ban. And the headline
14 just right now a couple of hours ago, "House GOP gives up
15 on health care bill as Trump suffers first legislative
16 defeat."
17 (Applause.)
18 BOARD MEMBER DE LA TORRE: So when your parents
19 are fighting --
20 (Laughter.)
21 BOARD MEMBER DE LA TORRE: -- you can see which
22 one has their act together and which one doesn't.
23 (Applause.)
24 BOARD MEMBER DE LA TORRE: Again, we understand,
25 I understand this difficult spot you're in. But your

1 interests, your business interests long term and in the
2 marketplace of vehicles in this world are more aligned
3 here than they are elsewhere.
4 And I'll close with again going back to the
5 beginning of all this, which is "a deal is a deal." There
6 were three parties at that table back in 2012. We're one
7 of those parties, and we are going to continue to exercise
8 our authority under that deal until we decide that that
9 deal is no longer valid.
10 Thank you.
11 CHAIR NICHOLS: Thank you. Next in line is Vice
12 Chair Berg, who I believe is going to actually propose the
13 resolution.
14 VICE CHAIR BERG: Well, I do see -- Diane, did
15 you want to make a comment?
16 BOARD MEMBER TAKVORIAN: Is that before --
17 VICE CHAIR BERG: Yeah, I'm going to move. Okay.
18 BOARD MEMBER TAKVORIAN: Thank you.
19 Well, hard to follow Member De La Torre. I would
20 say current White House tenant, 0; human environmental
21 rights, 3. Let's call it that so far, at least on the
22 books. So I'd say bet on California if that's a summary.
23 And I want to thank all of CARB. I am inspired
24 by our Chair's opening comments, and I think that
25 this -- this is a CARB legacy issue. And it's clear that

1 this Board is committed, the staff is committed. You've
2 made it happen, and not just for California and the United
3 States but for the world.
4 Since we're all disclosing our vehicles, I guess
5 I need to say that --
6 (Laughter.)
7 BOARD MEMBER TAKVORIAN: -- I drive a 2012 Volt.
8 And my experience in purchasing was probably different
9 than Dr. Balmes. It actually wasn't in the front lot. I
10 knew what I wanted when I walked in. And there was a
11 sales guy that said, "Really? You sure? I can put you in
12 this" whatever. But I knew what I wanted, and it has
13 since then been a really positive experience. But that's
14 four years -- five years and I think it's really changed.
15 Unfortunately there's one mechanic at our
16 dealership that -- and, you know, we're on a first-name
17 basis and I know what his days on and off are, so I know
18 when I can get service.
19 But -- you know, but I think it's changing and
20 it's great to be part of that evolutionary change and to
21 watch those things happen and to hear these stories.
22 I will say - and no one will be surprised by
23 this - that, you know, one, low income communities and
24 disadvantaged communities are benefiting from these ZEVs
25 being on the road. We are located next to freeways and

next to major roadways. So the cleaner these cars get, the less polluted our communities get, the less asthma our kids have. So that's a huge advantage, and no one can deny that.

The other fact is is that our communities are not part of this story yet. And we need to be. So we need to improve the incentives. I endorse what folks have said about really needing to make those incentives better, and we need to make them more available for low and moderate income families - I think that's really important - and for the secondary market. It's important for folks to be able to purchase these cars on the second round.

So I support the measure and I congratulate everyone who's worked so hard on it. And everyone who is here today, we really appreciate all of your hard work on it.

BOARD MEMBER BALMES: Before you go and propose the resolution, I just want to say -- I've already shared this with my partners here -- my Chevy Volt dealer must have heard me, because they're now trying to sell me a Volt. "Electric cars of the future. Come see the new Chevrolet Volt here at" --

(Laughter.)

BOARD MEMBER BALMES: "Please call for a test drive."

(Laughter.)

VICE CHAIR BERG: Madam Chair, understanding the only thing that is preventing us to go to lunch is moving Resolution Number 17-3. I propose that we adopt --

BOARD MEMBER SHERRIFFS: Second.

VICE CHAIR BERG: -- Resolution 17-3.

BOARD MEMBER BALMES: I enthusiastically second.

CHAIR NICHOLS: All right. Will all in favor please signify by saying loudly aye.

(Unanimous aye vote.)

CHAIR NICHOLS: Any opposed?

None opposed.

No abstentions.

All right. Thank you all so much.

And we will take a lunch break, and we will be back to take up our last item of the day, which is the report on the ZEV investment plan after lunch at 2 -- no, wait -- 3 -- 3 o'clock.

(Off record: 1:44 p.m.)

(Thereupon a lunch break was taken.)

1 A F T E R N O O N S E S S I O N
2 (On record: 3:06 p.m.)
3 CHAIR NICHOLS: Ladies and gentlemen, we're ready
4 to resume the meeting.
5 We have quite a number of people who've signed up
6 to talk on this item. So let's just get started with the
7 staff presentation.
8 This is the discussion of the First Draft
9 Volkswagen Zero-Emission Vehicle Investment Plan.
10 The diesel emission enforcement case has been
11 settled through a series of partial consent decrees
12 covering mitigation of the emissions caused by the
13 noncompliant diesel vehicles, vehicle buy-back and repair
14 solutions to address the polluting vehicles and compensate
15 the vehicle owners, and a commitment by the company to
16 invest in zero-emission vehicle programs that will support
17 the ZEV market.
18 Last December, staff updated the Board on
19 activities associated with implementing part of a
20 Volkswagen 2 liter engine diesel partial consent decree;
21 specifically, the zero-emission vehicle investment
22 commitment.
23 Since the December update, a settlement for the 3
24 liter engines and also a penalty settlement have each been
25 agreed on. The two new settlements will bring another

1 $220 million to California along with other benefits such
2 as a required increase in available Volkswagen ZEV models
3 and vehicle types. Today's update is focused primarily on
4 the investment commitment portion of the 2 liter consent
5 decree.
6 Just as a reminder, because this comes up every
7 time this topic comes up again, Appendix C, the ZEV
8 investment settlement, is not either a civil penalty or
9 mitigation. It does commit Volkswagen to investing $800
10 million in California on ZEV infrastructure, brand-neutral
11 public awareness marketing, increasing access to ZEVs, and
12 green city projects.
13 So if done well, this investment will benefit
14 Volkswagen in their new ventures into the ZEV world
15 without a doubt. But it will also benefit equally, if not
16 more so just based on numbers, the other firms and
17 stakeholders that are involved in ZEV as well.
18 In February, staff provided Volkswagen with a
19 publicly available guidance document intended to inform
20 the company's first 30-month ZEV investment plan. This
21 guidance document was based on public input, feedback from
22 the Board, and input from our sister state agencies, as
23 well as the California Legislature.
24 Earlier this month, as required by the consent
25 decree, Volkswagen submitted a draft ZEV investment plan

1 to ARB staff. I look forward to hearing more about the
2 plan, in particular how well it aligns with the
3 requirements of the consent decree and our February
4 guidance.
5 So, Mr. Corey, will you please introduce this
6 item.
7 EXECUTIVE OFFICER COREY: Yes. Thanks, Chair
8 Nichols.
9 So Appendix C of the 2 liter partial consent
10 decree requires investment plans noted by Volkswagen. And
11 Volkswagen must invest, as you noted, $800 million in ZEV
12 projects in California over four consecutive 30-month
13 periods.
14 Eligible projects include installing
15 zero-emission vehicle fueling infrastructure,
16 brand-neutral consumer awareness campaigns to increase
17 awareness of ZEVs, and therefore support growing ZEV
18 vehicle market and projects that will increase access to
19 ZEVs for all consumers in California, including those in
20 lower income and disadvantaged communities. VW may also
21 invest in green city project.
22 As noted, VW recently submitted its first plan to
23 ARB. This plan is currently being reviewed by ARB staff
24 with respect to its alignment with the consent decree and
25 the guidance by ARB to VW. This presentation of the Board

1 will review key elements of the consent decree and the
2 guidance document sent to VW, and provide an overview of
3 VW's draft plan in its adherence to the consent decree and
4 guidance, recognizing we're early in the review process.
5 Ellen Peter, our chief counsel, will now make a
6 brief statement providing the legal context for this item.
7 Ellen.
8 CHIEF COUNSEL PETER: Thank you, Richard.
9 VW has signed settlement agreements with owners
10 and lessees of the 3 liter and 2 liter diesel cars with
11 its VW dealers and with various state attorney generals.
12 In addition, VWAG, the German parent company, pled guilty
13 to criminal charges and must pay a $4.3 billion fine.
14 To date these settlements total over 20 billion
15 in liability. Moreover, many lawsuits are still pending
16 against VW around the country and around the world.
17 There are four settlement agreements that ARB
18 signed with Volkswagen. One is already approved by the
19 Court. And three agreements still need to be considered
20 by the Court probably on May 11, 2017.
21 From the settlements that ARB signed, California
22 will receive 153.8 million in penalties and costs, 423
23 million in mitigation trust monies, and an additional 25
24 million for low income Californians.
25 VW simply writes checks. They cannot touch this

money.

The market for clean cars was distorted by VW's marketing of their illegal diesel cars. One of the settlement agreements VW signed with ARB requires VW to invest 2 billion nationwide in zero-emission infrastructure and programs over the next 10 years. 40 percent of that amount, 800 million, must be spent in California. The shorthand reference to this money is Appendix C.

The Court-approved settlement places conditions on those investments. But in contrast to the other monetary relief, this is an injunctive term and it's not a penalty. VW must meet the consent decree's requirements contained in Appendix C, but the penalties are in other parts of the agreement, not in C.

Because staff's update today focuses on Appendix C, and since it's only one element of the agreements, I wanted to make this comment first up front just to set the stage.

Thank you.

EXECUTIVE OFFICER COREY: Thanks, Ellen.

Now, I'll ask Jeffrey Lidicker of the Emissions Compliance Automotive Regulation and Science Division to give the staff presentation.

Jeffrey.

1 AIR RESOURCES ENGINEER LIDICKER:
2 (Thereupon an overhead presentation was
3 Presented as follows.)
4 AIR RESOURCES ENGINEER LIDICKER: Good afternoon,
5 Chair Nichols and members of the Board.
6 Today I will be providing an update on the
7 implementation of the Volkswagen diesel settlement, in
8 particular Appendix C, the ZEV Investment Commitment. My
9 presentation will then provide a summary of VW's ZEV
10 Investment Plan and, finally, I will go over a timeline of
11 next steps.
12 --o0o--
13 AIR RESOURCES ENGINEER LIDICKER: Before we get
14 into the contents of the submitted Draft ZEV Investment
15 Plan, new settlement agreements have been reached between
16 VW, the U.S. EPA, and United States Department of Justice,
17 and the California Air Resources Board since the last
18 Board update in December. In addition to the approved 2
19 liter settlement, there is now a 3 liter and a civil or
20 penalty agreement pending court approval.
21 First, let's review the 2 liter settlement
22 approved by the federal judge last year. On October 25th,
23 2016, the United States District Court for the Northern
24 District of California approved a proposed partial consent
25 decree between ARB, VW, U.S. EPA, and the United States

1 Department of Justice. The consent decree partially
2 resolves Clean Air Act and California State claims against
3 VW for equipping its 2 liter diesel vehicles with defeat
4 devices. This consent decree mitigates the environmental
5 harm from the violations including the excess emissions
6 from 2 liter diesel cars on the road. There are four
7 elements of the consent decree. Each element is described
8 in a separate appendix.
9 --o0o--
10 AIR RESOURCES ENGINEER LIDICKER: The 2 liter
11 agreement requires Volkswagen to pay billions of dollars
12 to address the vehicles on the road through a buy-back or
13 fix if approved by ARB and EPA. It also establishes a
14 mitigation trust VW will pay for to mitigate excess NOx
15 emissions as well as an excess $800 million -- $800
16 million ZEV investment commitment. About $381 million
17 from the NOx mitigation trust will come to California to
18 be spent by the State.
19 Under the ZEV investment commitment VW will
20 invest in eligible projects including ZEV infrastructure,
21 access to ZEVs via a green city, and awareness, all of
22 which will be discussed in more detail shortly.
23 --o0o--
24 AIR RESOURCES ENGINEER LIDICKER: The VW 3 liter
25 partial consent decree was approved upon in December of

1 last year and has not yet been approved by the judge.
2 Under the 3 liter agreement VW will continue almost $42
3 million to -- contribute almost $42 million to the NOx
4 mitigation trust for the State to spend, and $25 million
5 to the Air Pollution Control Fund intended for the State
6 to spend on ZEV-related projects for low income
7 Californians. Also, in the 3 liter California agreement
8 are requirements for a second green city comprised
9 primarily of disadvantaged communities. Additionally, new
10 ZEV models and vehicle types, such as crossover vehicles,
11 are to be brought to the California market in 2019 and
12 2020. The 3 liter agreement also includes a requirement
13 that VW sell at least 5,000 new ZEVs per year in
14 California from 2019 to 2025.
15 --o0o--
16 AIR RESOURCES ENGINEER LIDICKER: Finally, a
17 civil penalty agreement, which covers both 2 and 3 liter
18 diesel engines, has been reached, but also has not yet
19 been approved by the judge. This agreement provides that
20 VW will pay $153.8 million in penalties into the
21 California Air Pollution Control Fund in addition to
22 injunctive relief.
23 The different elements of the settlement work
24 together to address the need to make the vehicle owners
25 whole through either buy-pack or repair of the vehicles,

1 mitigation of the environmental harm caused by the
2 increased emissions coming from the cars, actions to
3 repair the green car market through the support of the ZEV
4 market and, finally, penalties to push -- punish VW for
5 wrongdoing and deter others from violating our standards.
6 --o0o--
7 AIR RESOURCES ENGINEER LIDICKER: This slide
8 summarizes the VW monetary settlements in one table, and
9 clarifies the distinct intentions for each category of
10 funding. In the far left column, the three parcel
11 settlements are listed.
12 In the middle column are the traditional monetary
13 relief sums, which are mitigation funds and penalties.
14 In the column on the right is the injunctive
15 relief, or more innovative agreement benefits. In
16 particular, the $800 million is a commitment by VW to
17 invest in ZEV support in California. This investment is
18 expected to have global impacts that transcend the borders
19 of California, and that will hopefully support the vehicle
20 market both in California and in the rest of the United
21 States.
22 Although the funds are to be spent by VW,
23 California has retained parameters within which the funds
24 must be spent. We expect that the result is that at the
25 end of the 10-year spending commitment the investments

1 will not shut down, not be removed, but that they will
2 continue on in service. And in order for this
3 self-sustaining goal to be achieved, VW may be able to
4 benefit from its investments and a profit by year 10 is
5 possible and even necessary.
6 Although some of the monetary relief funds go to
7 a trust and some go to the California Air Pollution
8 Control Fund, in total there will be approximately $600
9 million for the State to spend, which is completely
10 separate and different from the sum VW will spend in
11 California.
12 Total settlement funding for California amounts
13 to almost $1.4 billion. To put the $1.4 billion into
14 context, the national amounts VW will spend including its
15 commitment to buy back or fix affected vehicles over $14.7
16 billion, not even including the 3 liter buyback or fixed
17 costs.
18 --o0o--
19 AIR RESOURCES ENGINEER LIDICKER: This slide and
20 the next slide summarize Appendix D, the Environmental NOx
21 Mitigation Trust, which was discussed at the December
22 Board hearing, and provide an update in light of the new
23 arrangements.
24 California will receive $381 million from the
25 trust under the 2 liter agreement and $42 million from the

1 trust under the 3 liter agreement to California to
2 mitigate the total lifetime excess NOx emissions resulting
3 from the use of illegal defeat devices.
4 The trust will fund specified mitigation actions
5 to replace older, dirtier, heavy-duty vehicles and
6 equipment with cleaner vehicles and equipment.
7 The consent decree specifies nine eligible
8 mitigation action categories that can be funded. They
9 include: Scrap and replace funding for on-road freight
10 and drayage trucks; transit, shuttle and school buses;
11 ferries and tugs; and off-road freight equipment;
12 Shorepower for ocean-going vessels; and
13 Up to 15 percent of the trust may also be used to
14 fund light-duty electric vehicle charging stations and
15 hydrogen refueling stations.
16 --o0o--
17 AIR RESOURCES ENGINEER LIDICKER: Based on past
18 experiences with states other than California, U.S. EPA
19 required the use of a trust for the mitigation fund. The
20 trustee, Wilmington Trust, was approved by the judge as of
21 March 15th, and the mitigation trust is expected to be
22 effective later in 2017.
23 VW will deposit the required funds into the trust
24 in three equal annual installments beginning within 30
25 days after the trust effective date. The trustee will be

1 responsible for disbursing the funds. The Governors of
2 each state will name a respective lead agency to manage
3 the trust funds allocated to that state. The lead agency
4 for California has not yet been named.
5 --o0o--
6 AIR RESOURCES ENGINEER LIDICKER: As mentioned,
7 the Governor will identify a lead agency to act on the
8 State's behalf in implementing California's allocation of
9 the trust.
10 Once the Governor has identified a lead agency,
11 that agency's task will include developing, through a
12 public process, a beneficiary mitigation plan that
13 describes the overall use of the funds; implementing the
14 beneficiary mitigation plan and the mitigation actions
15 identified in the plan; and submitting semi-annual reports
16 to the trustee on the implementation status of the
17 mitigation actions.
18 Staff will present a status update on Appendix D
19 to the Board later this year.
20 --o0o--
21 AIR RESOURCES ENGINEER LIDICKER: Now I will turn
22 to the 2 liter agreement's ZEV Investment Commitment in
23 Appendix C. This portion of the 2 liter consent decree
24 includes the following:
25 A commitment for VW to invest $2 billion over a

1 10-year period in ZEV-related programs in the nation. Of
2 that $2 billion, $800 million will be invested in
3 California, which is about 40 percent of the total
4 commitment.
5 The investments will be carried out in four
6 30-month spending cycles, with about $200 million being
7 spent in each cycle. For each ZEV investment cycle, VW
8 will submit a plan to ARB for review and approval, and the
9 investments made will be reviewed annually by a third
10 party auditor.
11 The goals of the investment plan laid out in the
12 consent decree are to promote and advance the use and
13 availability of ZEVs in California by supporting
14 transportation electrification, supporting the next
15 generation of zero-emission vehicles, growing the ZEV
16 market, and supporting access to ZEVs. This could include
17 increasing access to low- and moderate-income consumers
18 and disadvantaged communities.
19 AIR RESOURCES ENGINEER LIDICKER: The 2 liter
20 consent decree establishes eligible investment categories
21 for VW that support the goals of Appendix C.
22 These include: ZEV infrastructure, brand-neutral
23 education and public awareness campaigns, ZEV access
24 programs and a green city initiative.
25 Pending judge approval of the 3 liter Consent

1 Decree, a second green city will be funded from the 2
2 liter funds that must be comprised of primarily
3 disadvantaged communities.
4 --o0o--
5 AIR RESOURCES ENGINEER LIDICKER: We'll turn now
6 to a review of milestones to date for Appendix C and then
7 begin the summary of the VW ZEV Investment Plan.
8 Recall that the 2 liter partial consent decree
9 was approved by a federal judge in October of last year.
10 Subsequently ARB held a public workshop, a public Board
11 hearing, and a public open comment period last year
12 specifically to gather public comment to use in developing
13 the guidance document, which ARB submitted to VW on
14 February 10th of this year.
15 The guidance document represents a summary of
16 California's priorities and advice based on public input
17 regarding ZEV investment opportunities consistent with the
18 objectives and criteria set forth in Appendix C.
19 VW's draft ZEV Investment Plan was posted online
20 for public access and comment on March 14th. At the same
21 time, a notice went out via listserv to notify members of
22 the public that the draft plan was available.
23 --o0o--
24 AIR RESOURCES ENGINEER LIDICKER: ARB approval of
25 the VW ZEV Investment Plan is based primarily on the terms

1 of the 2 liter Partial Consent Decree, specifically in
2 Appendix C. All spending in the plan must be within the
3 eligible spending categories of ZEV Infrastructure, ZEV
4 Access, ZEV Awareness, and Green City.
5 Examples of specific requirements for projects
6 include brand-neutral ZEV public awareness efforts; and
7 should VW create any new companies or services to comply
8 with the consent decree, such as a car-sharing company, EV
9 freight service, or an EV charging company, all associated
10 marketing cannot mention any automobile brand in writing
11 or display any automobile brand logos.
12 --o0o--
13 AIR RESOURCES ENGINEER LIDICKER: The consent
14 decree also requires that the ZEV Investment Plan:
15 Provide a description of all ZEV investments, contain
16 an explanation of how each investment makes progress
17 towards and/or meets one or more of the goals identified
18 in the consent decree;
19 Contain an estimated schedule for implementing
20 each investment and milestone of each project in 6-month
21 intervals; and
22 Contain projections of anticipated credible costs
23 associated with each investment broken out by 12
24 stipulated accounting categories.
25 --o0o--

1 AIR RESOURCES ENGINEER LIDICKER: I'll turn the
2 presentation now to a summary of VW's first ZEV investment
3 plan submittal. ARB received the plan about two weeks ago
4 and it is undergoing review.
5 --o0o--
6 AIR RESOURCES ENGINEER LIDICKER: To start, this
7 slide shows a breakdown of how VW proposes to split its
8 first $200 million investment cycle funds.
9 The table shows in millions of dollars the
10 approximate allocation of first-cycle funds by spending
11 category. You can also see the national spend along with
12 California numbers and the totals along the bottom.
13 As you can see, with the national investment of
14 $300 million, the total VW investment in California and
15 the nation combined will be half of a billion dollars.
16 For California, VW proposes to spend $120
17 million, or 60 percent of the budget, on ZEV
18 infrastructure; $44 million, or 22 percent, on Green City
19 initiatives; and $20 million, or 10 percent, on ZEV
20 education and access programs. Overhead for all of these
21 activities is projected to be less than 10 percent.
22 --o0o--
23 AIR RESOURCES ENGINEER LIDICKER: I will now
24 summarize the EV charging network vision that VW includes
25 in its plan submittal.

1 For locations with long parking times, such as at
2 multiple unit dwellings and at the workplace, VW's plan
3 includes installation of level 2 chargers that have
4 approximately 7.2 kilowatts of power. This power equates
5 to about 20 minutes of range for each hour charge. These
6 installations would benefit a broad cross-section of
7 drivers who have not been served by the traditional
8 at-home charging model.
9 For locations with medium parking times, such as
10 at retail or municipal garages, VW's plan includes
11 installation of level 2 chargers or even 50 kilowatt DC
12 Fast Chargers. VW's plan also includes experimental
13 community depots. These community depots would be
14 conveniently located adjacent to multi-unit dwellings but
15 don't currently have charging access, and will provide
16 fast-charging capabilities.
17 This new concept simulates a gasoline station and
18 has the potential to serve disadvantaged communities.
19 VW's plan notes that some of these community depot
20 stations may be at the "super" 150 kilowatt power level
21 for even faster charge times. DC fast chargers installed
22 to date are typically only 25 to 50 kilowatts by
23 comparison. The community depots are a new concept that
24 would provide data and learnings for the future.
25 For locations with extremely short parking times,

1 such as along highways, VW's plan includes installation of
2 150 kilowatt super fast chargers and also some 320
3 kilowatt chargers. These very high-powered chargers are
4 designed to respond to anticipated future ZEV needs.
5 The plan describes bringing two innovations to
6 the market with these investments: The community depots
7 designed to function as electric gas stations for those
8 who cannot charge at home, and highway fast chargers that
9 are up to six times faster than currently installed
10 chargers. Chargers this fast could provide 200 miles of
11 range in potentially just over 10 minutes.
12 --o0o--
13 AIR RESOURCES ENGINEER LIDICKER: This slide
14 shows the overall EV charging infrastructure budget and
15 timeline in the plan for the first 30 months. The plan
16 allocates $40 million, or one-third of the budget, to the
17 community-based or local charging networks, which would be
18 expected to yield over 350 stations.
19 $65 million, or 54 percent of the budget, is
20 allocated to the long-distance highway network, which
21 would be expected to yield over 50 stations.
22 According to ARB's estimate, the total $120
23 million investment in EV chargers is expected to satisfy
24 less than 10 percent of California's estimated demand
25 based on the State's goal to have enough infrastructure in

1 the State to support 1 million ZEVs by 2020.
2 This table, reproduced from the VW ZEV investment
3 plan, shows the approximate timeline for the development
4 and installation of the EV charging stations over the
5 first 30 months.
6 Even more chargers could be installed in
7 subsequent 30-month cycles. Adherence to this timeline is
8 dependent upon when the ZEV Investment Plan is approved by
9 the State.
10 --o0o--
11 AIR RESOURCES ENGINEER LIDICKER: VW's ZEV
12 Investment Plan describes how the infrastructure plan was
13 developed. This includes the use of a gap analysis to set
14 the number of charging stations and their proposed
15 locations. This gap analysis is based on the difference
16 between the currently installed infrastructure and the
17 projected demand. VW's proposal is to locate stations
18 where they are most needed after taking into account
19 existing stations. This would mitigate the effect on
20 existing companies, as any location that already has
21 adequate infrastructure won't be considered for new
22 stations.
23 The Plan describes the total investment amount
24 for EV infrastructure in the first 30-month cycle as being
25 $120 million. Lastly, the Plan states that the planned

network will be interoperable, meaning that there will be universal access. All chargers would accept several forms of payment, including credit cards, and all nonproprietary charging standards would be supported.

--o0o--

AIR RESOURCES ENGINEER LIDICKER: This slide details -- shows the details of the community or local charging network described in the Plan submittal.

The Plan states that over 350 EV charger stations are targeted to be installed in communities. The plan calls for a mix of charger types including level 2 and multiple power level DC fast chargers. Installations in multi-unit dwellings and workplace locations, on which an emphasize was placed at the Board hearing in December, would benefit underserved communities.

As I'll describe further in coming slides, VW proposes an initial focus for its community and local charging in five metropolitan areas of California.

--o0o--

AIR RESOURCES ENGINEER LIDICKER: Cash guidance to VW articulated the need for investments not to be sprinkled all over the entire state and to learn from mistakes made in the past where some installed infrastructure has gone unused.

VW's plan selects for EV charger installations

five major metropolitan areas that cover the majority of the projected ZEV adoption. VW notes that other areas may be included in subsequent spending cycles.

VW's approach would insure initial investments are utilized, which will ultimately drive success throughout the State of subsequent investments. The following slide describes the methodology laid out in the plan in more detail.

--o0o--

AIR RESOURCES ENGINEER LIDICKER: This image comes from the VW ZEV Investment Plan and shows the process VW describes in the plan to select the five areas for EV charging installation in the first spending cycle. The VW plan states that the decision process for selecting these areas and allocating funds included an analysis of each region's projected needs versus current supply.

--o0o--

AIR RESOURCES ENGINEER LIDICKER: Switching now to the long distance network chargers, this is a map provided by VW in the ZEV Investment Plan submittal that shows the upper two quartiles of the CalEnviroScreen in red and yellow. Imagine, if you will, a highway network of approximately 50 stations spanning east to west and north to south.

VW's plan states that roughly 25 percent of these

chargers will be in communities in the top quartile of the CalEnviroScreen scores, and over 50 percent, or half, of the chargers will be in communities in the upper half of the CalEnviroScreen.

These DC fast charger stations may act as anchor investments supporting communities that currently have little or no ZEV infrastructure. Installation of over half of the VW long-range EV charger stations in disadvantaged communities may spur EV adoption.

Characteristic of long-range charging is the desire for the shortest possible charge time. To answer this challenge, VW proposes a network that would consist of 150 kilowatt and 320 kilowatt chargers, which are three to six times faster than current DC fast charger equipment. These higher power DC fast chargers will enable fast charging times for vehicles on the horizon with longer range. In short, these chargers will be future proofed against technology development over time.

VW describes a network that would cover about 12 highways, with each site in the network having an average of five plugs with some of each charging standard.

--o0o--

AIR RESOURCES ENGINEER LIDICKER: This table from the VW ZEV Investment Plan shows more detail about the charger network locations. The Plan's goal is to create a

1 California highway network designed to place high speed
2 charging stations along the long-distance routes with the
3 highest estimated ZEV traffic, as well as to link the
4 prioritized metro areas to form a cohesive statewide
5 network. Many of these locations could also serve
6 disadvantaged communities.
7 --o0o--
8 AIR RESOURCES ENGINEER LIDICKER: Now I will move
9 on to the Green City portion of the VW ZEV Investment Plan
10 submittal.
11 If the 3 liter agreement is approved by a judge,
12 there will be two Green Cities, with the second one
13 predominantly consisting of disadvantaged communities.
14 Thus, VW's Plan selects the first Green City based on its
15 composition of disadvantaged communities secondarily and
16 primarily for its potential success and potential
17 benefits.
18 This first city will grow the Green City
19 technology and business models, which do not exist
20 anywhere in the U.S. at this time.
21 It will spread the word to other cities, acting
22 as a demonstration ground and as an example or model.
23 Lessons learned from this city would inform
24 planning and decisions for the second Green City and
25 contribute greatly to the second Green City's likelihood

of success.

Although the Plan envisions investing in several services and models relying on technology not yet developed, such as possibly autonomous vehicles in later spending cycles, VW proposes that the first spending cycle consist of ZEV car-share and ZEV delivery services. These are intended to increase accessibility of ZEVs to city inhabitants and create a green mobility habitat. The Plan sees these initiatives as serving as pilots to help spur the widespread adoption of ZEVs and mobility services.

--o0o--

AIR RESOURCES ENGINEER LIDICKER: As mentioned, VW's stated objectives for the Green City program are to offer a set of ZEV initiatives that are accessible to the city inhabitants and create a green mobility habitat. These initiatives should be leveraged to offer residents better quality of life through enhanced mobility and improved air quality.

This edited figure also comes directly from the VW ZEV Investment Plan and presents the analysis that led to identification of the first Green City candidates.

Step 1 on the figure indicates that VW began its analysis by looking for a city with a population size of greater than 400,000 residents, which the Plan describes as a city large enough for scalability of projects, with

1 demand for car-sharing programs and the potential for
2 increasing ZEV access to disadvantaged communities.
3 Step 2 on the figure indicates that VW evaluated
4 each of the remaining cities for Mobility Fit, which it
5 further defined in the displayed subfactors: Mobility
6 demand or the VMT of the city, the community flow patterns
7 specific to the city, and an evaluation of the other
8 transport services available within the city (such as
9 Car-share or Uber or otherwise). The plan explains that
10 these factors are considered against the functionality of
11 ZEVs that will be used in the Green City programs.
12 Step 3 on the figure indicates that VW then
13 evaluated the cities for potential impact, which is
14 further defined in the displayed subfactors: Societal
15 Impact, which refers to the magnitude of the potential
16 change; Implementation Feasibility, which refers to the
17 practicality of implementing such programs in a particular
18 city; and Awareness Impact, which refers to the potential
19 impact on city residents and possibly other entities
20 outside the city.
21 The Plan then combined the scores from steps 2
22 and 3 to arrive at a final score for each city. You can
23 look at the posted ZEV Investment Plan on ARB's website to
24 see the weighting system described in the Plan. ARB staff
25 are still evaluating this city selection process.

--o0o--

AIR RESOURCES ENGINEER LIDICKER: The Plan identified three potential Green City initiatives on which to focus: ZEV car-sharing, ZEV delivery fleet, and a ZEV taxi fleet provider. To support these initiatives, the Plan proposes the installation of approximately 50 EV chargers for the ZEV Car-share program and 25 more for the ZEV delivery fleet in the first 30-month cycle.

The Plan's proposed first Green City is Sacramento.

--o0o--

AIR RESOURCES ENGINEER LIDICKER: Moving on to the ZEV Awareness Campaign outlined in the VW ZEV Investment plan, we see a budget of $20 million in California for this first 30-month cycle.

These programs must be brand neutral, as stipulated in the consent decree, and must not feature or favor VW group vehicles. However, they may say "sponsored by VW" at the end, but neither that message nor VW's name or brand may be prominently displayed.

The VW ZEV Investment Plan describes a multimedia or multi-channel ZEV awareness campaign. The proposed multimedia approach utilizes each media channel to deliver a different part of the message. The Plan states that VW would utilize television to expand the audience and

1 familiarize the audience with ZEVs, and outdoor
2 advertising such as billboards or consistent signage at
3 charging stations to show the benefits of ZEVs and
4 charging infrastructure. Digital media, experiential
5 programs, and partnerships with other entities are
6 proposed to further deliver different parts of the
7 message.
8 One example given by the Plan is that television
9 may be used in phase 1 to raise the overall ZEV awareness,
10 while on-line digital media could be used in subsequent
11 phases to disseminate more specific messages and deal with
12 particular issues associated with ZEVs.
13 VW describes plans for experiential initiatives
14 like ride-and-drive events under Public Access
15 Initiatives. In the National Plan, ride-and-drives are
16 considered Public Access Initiatives. California,
17 however, cease sees these activities as public awareness
18 building activities and not access activities.
19 --o0o--
20 AIR RESOURCES ENGINEER LIDICKER: That concludes
21 our summary of VW's ZEV Investment Plan submittal. I'll
22 talk now about how we will go about evaluating the plan.
23 ARB staff is soliciting public comment and
24 direction from the Board on the evaluation of the VW ZEV
25 Investment Plan for consistency with the goals and terms

1 of Appendix C. ARB will approve or disapprove the plan,
2 in whole or in part.
3 Key metrics of the evaluation process will
4 include the plan's adherence to the requirements set forth
5 in the 2 liter consent decree.
6 Quickly, some of the consent decree requirements
7 for what must be included in the Plan are:
8 The plan should include a description of all
9 investments.
10 It should detail how each investment makes
11 progress toward one or more of the goals of the consent
12 decree.
13 EV charging should be able to service all ZEVs
14 with nonproprietary connectors.
15 ZEV investments should not be concentrated in a
16 single area of the State.
17 Investments cannot include research and
18 development.
19 The plan must address charging station
20 maintenance.
21 The plan must include charger implementation plan
22 details, a description of how VW will monitor and
23 maintaining each ZEV investment, the anticipated
24 creditable costs associated with each project, and an
25 estimated schedule for implementing each investment in

1 six-month intervals.
2 --o0o--
3 AIR RESOURCES ENGINEER LIDICKER: Other key
4 metrics to evaluate the plan include those laid out in the
5 Guidance document sent to VW containing further
6 information to be included in the plan and provided
7 information regarding ZEV investment opportunities that
8 are consistent with the objectives and criteria set forth
9 if Appendix C. The Guidance reflects the public input
10 received through late 2016. These include the following:
11 Early, visible progress.
12 Projects that are transformational.
13 EV infrastructure that includes multiple unit
14 dwellings, workplace, public, and long-range sites.
15 Investments be complimentary and additional.
16 Programs prioritize disadvantaged, low-income,
17 and disproportionately impacted communities.
18 Investments include business competition and
19 conduct considerations, including a self-sustaining model.
20 That the Awareness campaign include
21 multi-lingual, multi-cultural elements.
22 Access in Green Cities that prioritize
23 disadvantaged communities and track performance.
24 That Data collection and reporting is important
25 and expected.

1 And encouragement of hydrogen infrastructure
2 investment.
3 --o0o--
4 AIR RESOURCES ENGINEER LIDICKER: After ARB has
5 approved the ZEV Investment Plan, VW has a lot of work to
6 do in a short time frame.
7 VW has to coordinate the site selection process
8 with input from multiple stakeholders including state
9 agencies, local authorities, and site hosts.
10 After that will be site permitting and the
11 negotiating and signing of up to hundreds of contracts.
12 In short, VW will have to spend at an
13 unprecedented rate for an extended period of time.
14 --o0o--
15 AIR RESOURCES ENGINEER LIDICKER: This slide
16 reviews the timeline and the process for ARB's eventual
17 decision on the VW ZEV Investment Plan.
18 The Draft plan was posted on March 14th. Public
19 comment was also opened on this same day with a notice on
20 the website and an invitation for public comment via
21 listserv.
22 A legislative hearing was held on March 21st and
23 the ZEV Investment Plan has been presented to the Board
24 today.
25 The public comment period will close April 10th,

1 almost a month after it opened.
2 Briefings for various entities such as
3 legislators and interested Board members will be held, and
4 the target dates for preparing and issuing the decision is
5 late April.
6 --o0o--
7 AIR RESOURCES ENGINEER LIDICKER: But the process
8 does not end once a ZEV Investment Plan is approved. VW
9 will present to ARB staff every six months on its
10 progress, as well as submit written reports to ARB
11 annually.
12 VW has requested ongoing coordination with state
13 and local agencies. The goal is to collaborate on site
14 selection, dialogue with utilities, and help with
15 permitting and easement efficiencies.
16 Working with state agencies will provide
17 additional oversight and help the projects complement the
18 state's investments, and afford the opportunity to ensure
19 project implementation meets the state's goals, especially
20 for investment in disadvantaged communities. ARB's new
21 Assistant Executive Officer for Environmental Justice is
22 expected to be part of this group.
23 Additionally, an independent third-party auditor
24 will provide annual reports on spending and accounting for
25 all projects related to the Plan.

1 And just with you think it's time to rest --
2 (Laughter.)
3 AIR RESOURCES ENGINEER LIDICKER: -- there will
4 be ZEV Investment Plan 2, then the 3rd, and finally the
5 4th over the next 10 years. ARB will main a public and
6 transparent process throughout this 10-year investment
7 period.
8 --o0o--
9 AIR RESOURCES ENGINEER LIDICKER: The investments
10 to be made by VW are coming at a critical time, as the ZEV
11 market ramps up in the coming years. These programs and
12 services have the potential to be transformative and
13 highly supportive of California's efforts to grow the ZEV
14 market and broaden the reach of electrified transportation
15 to all Californians, include those in disadvantaged
16 communities. Beyond California, this commitment by VW has
17 the potential to support additional ZEV markets critical
18 to the overall success of ZEV transportation.
19 Finally, we look forward to keeping the Board
20 informed about the VW ZEV Investment Commitment.
21 Thank you for the opportunity to provide this
22 update.
23 CHAIR NICHOLS: Okay. Let me just make a couple
24 comments before we get started with the witnesses.
25 First of all, I think we're going to invoke the

1 two-minute rule from the beginning here --
2 (Laughter.)
3 CHAIR NICHOLS: -- with 45 people who want to
4 comment. And the amount of comment that's been included
5 already in this process, I don't think we need to have the
6 three minutes from everyone.
7 However, that doesn't mean that we're not going
8 to be hearing from you; because as you can tell, this is a
9 long process. We're going to be with -- we're going to be
10 with this plan for many, many years. And that's a good
11 thing. But we want it to begin in as strong and
12 successful a way as we possibly can.
13 This is -- it's going to be an interesting
14 relationship.
15 I want to make sure that two things are clear.
16 First of all, I don't want to have this Board having to
17 hear every change in the plan, every adjustment in the
18 amount of money that's going to one category or another or
19 every issue that comes up with respect to a project. I
20 expect we'll be hearing from our constituents, you'll be
21 hearing from people on an ongoing basis. We're going to
22 want to be informed. And ultimately I suppose, at least
23 somewhere along the way before we get to the end of the
24 first period, we're going to want to audit, in effect, the
25 expenditures. And I want to be sure from staff that

1 that's your understanding, that we're going to be in a
2 position to do that.
3 I see head nodding, but I just want that to be
4 clear. Because right now what we're looking at is a
5 proposed expenditure plan, which has a fair amount of meat
6 on the bones, but still has a lot of missing detail which
7 will have to be developed in order for them to actually
8 spend the money.
9 Having had conversations with company in, you
10 know, recent weeks, I'm convinced that they are moving
11 fast and smart to figure this out.
12 But we're not going to be sitting back here in a
13 month, you know, line by line going through the
14 expenditure plan.
15 So Mr. Ayala or Mr. Corey, do -- or Ellen,
16 whoever.
17 Ms. Peter.
18 CHIEF COUNSEL PETER: Yes, Chair Nichols. In
19 terms of your request for the audit, built into the
20 consent decree is a third-party reviewer that we approved.
21 And that reviewer will go out and check on the different
22 aspects of it when -- including the money, including the
23 installation since we have on-the-ground checking. We
24 didn't want to take that on ourselves. That's not what we
25 do. But they at their expense has to go out and confirm

1 that these things are actually being built.
2 One of the questions that had come up before in
3 other charging situations is maintenance. We've had
4 people come in over the years talking about things not
5 being maintained. In the consent decree, maintenance is
6 required. And this is one of the things that the
7 third-party reviewer will collect that kind of data. So
8 we were trying to design a program, seeing problems we've
9 seen before, build that in, and then also make Volkswagen
10 pay for reviewer to go check that data. So that's built
11 in. Every six months there's a report back to ARB, a
12 meeting at least once every six months. There's annual
13 reports; those would be made public, including the
14 third-party reviewer and the audit. So we want to make
15 sure the money's going where it's supposed to go.
16 CHAIR NICHOLS: Okay. Thank you.
17 With that, let's start with our list, and begin
18 with Larry Greene from the Sacramento Air Quality
19 Management District.
20 MR. GREENE: Thank you. Thank you, Chairman
21 Nichols and members of the Board. I'm pleased to be here
22 and have this opportunity to testify on behalf of my board
23 and our collaborative partners in the Sacramento region.
24 We commend the Board and staff for staying the
25 course on ZEVs and your great work on the VW case.

1 My testimony is in support of Sacramento as the
2 initial Green Cities location. I guess that's a surprise,
3 right?
4 (Laughter.)
5 MR. GREENE: Our district is part of a strong
6 network in our region. Our PEV collaborative, Take Charge
7 Sacramento, has regular meetings already to coordinate ZEV
8 efforts, and includes the city and county of Sacramento
9 sustainability managers, our fleet managers, our district,
10 SMUD, SACOG, Sac airports and other partners in our
11 region. It's already in place and prepared to help and
12 participate in the effort that -- the Green Cities effort.
13 We coordinate with and apply for grants through
14 the Air Resources Board, CEC, U.S. EPA, and DOE. We have
15 active grants for 29 EV school buses; 8 EVs and a car
16 sharing program in low-income areas; and are developing a
17 robust light-duty EFMP Program.
18 All those programs that I spoke of are directly
19 in or support our CalEnviroScreen communities in
20 Sacramento.
21 We're also collaborating with our regional
22 partners in developing and deploying hydrogen fuel cell
23 locomotive retrofits and hydrogen fuel cell Class A
24 tractors. So we have other kinds of activities that are
25 underway in our area too.

1 This program will roll out in Sacramento overlaid
2 on a robust and experienced set of partners that are ready
3 to help and participate. We will help this effort be
4 successful and look forward to the journey.
5 Thank you.
6 CHAIR NICHOLS: Thank you.
7 MR. SCHEMBRI: Thank you, Chairman Nichols and
8 Board for the opportunity to comment today and for your
9 leadership in ZEV deployment across California.
10 I'm Dave Schembri, CEO of EVgo, the largest
11 provider in the nation and in California of public
12 fast-charging services for all EV models. As of today,
13 approximately 90 percent of the State's population, or 35
14 million Californians, live within 35 miles of at least one
15 EVgo fast-charging freedom station.
16 We believe that the EV charging industry is at a
17 critical inflection point, needing a massive investment in
18 charging infrastructure. EVgo has been and will continue
19 to make investments in California and across the country.
20 But we enthusiastically welcome the $800 million in
21 California and $1.2 billions elsewhere in the U.S.
22 committed under the settlement agreement that will help a
23 broader deployment of EVs.
24 EVgo believes that this funding with the
25 oversight of the Board and active participation of a broad

1 array of private sector EV charging service providers and
2 suppliers will be critical to making widespread EV
3 adoption possible.
4 Cycle 1 of the California ZEV Investment Plan is
5 critical to ramping up an effort that focuses on public
6 charging infrastructures in cities and highways while also
7 laying the groundwork for sustained funding over the life
8 of the settlement.
9 Drivers want EV charging to be easy, accessible,
10 and affordable. EVgo is one of many private-sector
11 participants seeking to do just that. And the bulk of
12 those industry representatives believe that the additional
13 capital into the sector through Cycle 1 will definitely
14 help that effort.
15 So in conclusion: And we're committed to
16 fulfilling the vision of public charging infrastructure
17 for all. We support Cycle 1 and look forward to
18 continuing to work with the Board over the coming months
19 and years to ensure that this and subsequent segments of
20 the plan work to make EV charging accessible to all
21 Californians.
22 Thank you.
23 DR. LANGDON: First of all, thank you for this
24 California ZEV Investment Plan and all the great work that
25 went into this. And thank you for letting me comment.

1 My name is Chris Langdon. I am a research
2 associate professor at the Peter Drucker School of
3 Management at Claremont Graduate University, which is
4 located nearby.
5 Our school has submitted a proposal to
6 Volkswagen, and we are a little bit concerned that
7 something may be overlooked. What we are concerned about
8 can be summed up in just one word: "Customer."
9 Peter Drucker is the father of modern management,
10 and he once famously said, "If there is one purpose in
11 business, it is to create a customer." And though we all
12 agree with this, in reality customer centricity is too
13 often an afterthought. Too often there's a great deal of
14 excitement focused only on the technology side alone.
15 And let me quickly give you two examples in
16 transportation to illustrate the point.
17 Driver assistant systems. Automakers have spent
18 lots of money on this technology. On paper, this
19 technology makes sense. It saves lives. But many
20 customers switch it off. Why? Because it beeps and
21 blinks and distracts us. The fact that the customer has
22 been an afterthought is limiting the technology.
23 And then the example of EV sales. Most people
24 don't drive more than 40 miles per day; and engineers have
25 confirmed this in many, many market tests; and therefore,

they gave their cars double and triple the range just to be safe.

And yet, hardly anybody of us is buying EVs. Why? Because we as customers have anxiety that these vehicles don't have enough range and they're not convenient enough for us.

In engineering theory, 120 miles should be more than enough. But not in consumer psychology.

And this brings me to my point: Your initiative will invest some 120 million in creating more ZEV infrastructure. Is this what is truly holding back the ZEV future?

In closing, if Peter Drucker were still alive today, he would remind us to first do the right thing and before doing it right.

So, and bad customer centricity including customer economics and consumer psychology.

Thank you very much.

CHAIR NICHOLS: No questions?

I have a question for you, Mr. Langdon.

My understanding is that you or some of your colleagues have actually submitted a research proposal to use some of the funds for that purpose.

MR. LANGDON: Yeah, we could use an existing fleet to run experiments, you know, standard academic

1 research. We try to understand how can we really make
2 this more attractive for customers. In other -- yeah,
3 sorry.
4 CHAIR NICHOLS: No, I understand. I think it's
5 very interesting.
6 I guess my question is, is that actually
7 consistent with the consent decree? Can we use it for
8 that purpose? I know the company is doing its own -- I
9 mean quite a bit of internal -- some -- presumably paying
10 for some research to be done. But I don't whether they're
11 charging it against the fund.
12 CHIEF COUNSEL PETER: So research is not a
13 credible cost. But it -- it's like the Devil's in the
14 details. I don't understand what their proposal is. I
15 don't know -- you could -- VW can spend more than 800
16 million.
17 CHAIR NICHOLS: Of course.
18 CHIEF COUNSEL PETER: So you could actually --
19 they could give access to them to the data potentially. I
20 mean, there's different ways to do it. So I can't really
21 comment one way or the other. But pure research is not
22 eligible because we didn't want to have Volkswagen
23 frankly, you know --
24 CHAIR NICHOLS: We want actual --
25 CHIEF COUNSEL PETER: We want projects on the

ground.

CHAIR NICHOLS: Stuff, stuff. But at the same time, in the plan that they submitted to us - and I believe this is in the public plan - it indicates that they've done quite a lot of analysis and modeling of where there's a need and -- as you said, that they've thought a lot about infrastructure. So the question is, if we were -- well guess I can begin and ask the question of the company, what are they thinking in terms of where they should be further asking questions.

So thank you.

MR. LANGDON: Thank you.

BOARD MEMBER SHERRIFFS: Can I -- along those lines though, there is money in the settlement for public education and awareness. And this would certainly -- I mean, that's the implication of this, which is so important. It's great to have highlighted that. I don't know if research per se is going to fit in. But there clearly is money in the settlement, yes, for public awareness and outreach.

CHAIR NICHOLS: Okay. Thank you.

All right. Next.

MR. GROSS: Good afternoon, Chair Nichols and Board members. My name is Tom Gross with Southern California Edison.

1 Edison appreciates the opportunity to speak on
2 the first draft of the California Zero-emission vehicle
3 Investment Plan. Edison supports efforts to increase the
4 availability of electric vehicle infrastructure. We
5 recognize that zero-emission technology is essential to
6 the attainment of the national ambient air quality
7 standards and the State's GHG goals.
8 Electric vehicles with their storage capabilities
9 have the added benefit of allowing for greater utilization
10 of renewable energy.
11 The Volkswagen Zero-emission Vehicle Investment
12 Plan has a number of elements that have already been
13 articulated. And Edison supports these ideas as a part of
14 the plan. The State investor-owned utilities, as directed
15 in SB 350, have submitted applications to the CPUC for a
16 variety of electrification projects; some for light-duty
17 vehicles, others for heavy-duty projects. But there's a
18 great need for additional infrastructure and there's ample
19 space for both the investor-owned utilities projects and
20 the VW plans articulated here.
21 SCE looks forward to closely collaborating with
22 Electrify America on these important projects.
23 Thank you.
24 CHAIR NICHOLS: Thank you.
25 MS. REGE: Good afternoon, Chair Nichols and

1 members of the Board. I'm Julia Rege, Director for
2 Environment and Energy at the Association of Global
3 Automakers.
4 Global Automakers' companies sell 56 percent of
5 the vehicles purchased in California. And Global
6 Automakers has always and will continue to support that
7 all options of -- technology options will be needed to
8 achieve ZEV and climate-change goals going forward. And
9 so our companies are investing billions of dollars in
10 advanced technologies. That means plug-in hybrids,
11 battery electric, and fuel cell electric vehicles.
12 We appreciate the work that's been done to date
13 on the investment plan, but we are concerned it's too
14 narrowly focused on plug-in options. We recommend that
15 the plan include hydrogen as well and devote a portion of
16 funds specifically for hydrogen infrastructure. The
17 inclusion of this will help support this all-inclusive
18 approach that is needed going forward for a low-carbon
19 light-duty transportation fleet.
20 Thank you.
21 MR. LORD: Good afternoon. Nice to be up close
22 again today. I have a quick statement on the Volkswagen
23 Investment Plan. And my name is Michael Lord with Toyota
24 Motor North America.
25 Toyota fully supports ARB's technology-neutral

1 approach to vehicle electrification, and strongly agrees
2 with ARB's view that the VW Investment Plan should follow
3 the same principle and support the rollout of both plug-in
4 and fuel cell technologies.
5 As ARB has recognized, both battery and fuel cell
6 technologies will be critical and necessary to meet the
7 State's clean air and climate goals, and Toyota supports
8 the use of plan funds to support the market for both.
9 We believe the lack of investment in the
10 investment plan on hydrogen hurts the rollout of fuel cell
11 vehicles in relation to battery electric vehicles. By
12 failing to acknowledge the essential role that hydrogen
13 will play in electrification, not just in the light-duty
14 fleet but across the transportation spectrum, the current
15 proposal will seem to follow only one pathway, and a
16 pathway that not all manufactures are pursuing, in the
17 sense a proposal may not only fall short of being
18 technology neutral and serving ZEVs with nonproprietary
19 connectors, but also is arguably not brand neutral.
20 Toyota therefore urges ARB to work with VW to assure that
21 hydrogen is included in this and subsequent investment
22 plans.
23 Thank you.
24 MS. CHEN: Good afternoon, Chair Nichols, members
25 of the Board. I'm Patricia Chen with the countywide

1 planning department at the L.A. County Metropolitan
2 Transportation Authority, or Metro.
3 Metro is the regional transportation planning,
4 programming, construction, and transit operator authority
5 for Los Angeles County. We are located in the South Coast
6 Air Basin, which is a nonattainment area for both
7 particulate matter and ozone. With 26 percent of the
8 State's population and its registered vehicles, including
9 those affected by the settlement, to fully address the
10 Plan's goals, VW must invest significant resources in Los
11 Angeles County. We're grateful for the opportunity to
12 share a few thoughts regarding VW's public plan.
13 We support the inclusion of both community and
14 highway depots in the Plan network vision for chargers.
15 Our EV charger proposal seeks to install EV chargers at 93
16 commuter sites, with access to our rail and fixed guideway
17 customers, making over 400 million boardings per year.
18 Forty of these sites also happen to be located at
19 or near freeways. Widespread availability of chargers in
20 park-and-ride lots will encourage commuters to consider
21 acquiring electric vehicles. So we hope to be considered
22 under the plan.
23 I also want to mention that we agree with the
24 February 10th ARB guidance that transit is an important
25 element of the zero-emissions vehicle charging and

1 deployment system.
2 For our proposed battery electric upgrade of the
3 popular Orange Line busway, the on route chargers are a
4 meaningful incremental investment that can help bridge the
5 gap between current technology and operational challenges.
6 (Laughter.)
7 MS. CHEN: Okay. I wanted to just say that we
8 really appreciate the investment contemplated in
9 disadvantaged communities and also support the other
10 important proposals coming from L.A. County sponsors.
11 Thank you again for the opportunity to comment.
12 CHAIR NICHOLS: Thank you for being here.
13 MS. ADAMS: Hi. My name is Kitty Adams. I'm the
14 Executive Director of Adopt a Charger. Adopt a Charger's
15 a nonprofit organization that solicits sponsorship to
16 install electric vehicle chargers in places like national
17 parks, state parks, museums, and universities.
18 I wanted to thank CARB staff, Board members, and
19 Commissioner Nichols for leading the charge on this. I
20 think this is a wonderful opportunity. In the investment
21 plan they specifically mentioned the California State
22 Parks. I was happy to see that because it aligns with
23 Governor Brown's 2016 ZEV Action Plan that's requiring
24 charging at the parks.
25 I've been working in the park setting for --

since 2011. These are difficult areas to commercialize. The installations are very expensive. And in addition to this, these locations, these high profile destination locations, the intent is to go beyond just charging cars and educate the public. So when we can get the EV curious to engage in conversation with an actual owner, they're going to learn about the benefits of driving these cars.

Another important aspect of these chargers at the parks is it supports the greening of the fleet. It's allowing them to transition their light-duty fleet to plug-in electric vehicles.

Another important aspect to me is the 6,000 employees of the State Parks. This is low-hanging fruit when it comes to selling cars. There's actually pent-up demand with these people to purchase these vehicles.

This investment also complements the CEC grant that was awarded to Adopt a Charger in 2014 on behalf of the State Parks. Part of this we just completed a district-wide survey and we'll be able to prioritize the next round of parks to receive funding.

So thank you very much for considering the parks in this investment.

CHAIR NICHOLS: Thanks for your work.

MR. SHUMAKER: Perhaps I don't need an announcement?

1 Go ahead and start.
2 My name is Cory Shumaker. Thank you again for
3 allowing me to comment on the VW settlement. I represent
4 the California Hydrogen Business Council comprised of a
5 hundred companies.
6 Fuel cells offer a long range and fast refueling
7 capability that is not limited to light-duty vehicles, but
8 can offer -- also offer options for public transport,
9 transit, medium- and heavy-duty goods movement. And it's
10 also good to note that hydrogen is already at least 33
11 percent renewable. So I'd like to leave you with three
12 points.
13 Historically the State has been agnostic in its
14 support for technologies that offer zero tailpipe
15 emissions, which include fuel cell electric vehicles.
16 The CHBC membership voices its profound
17 disappointment in that of the $200 million first round of
18 Volkswagen investment settlement, zero dollars were
19 allocated to hydrogen fuel cell infrastructure in vehicle
20 deployment.
21 Next, by ARB's own AB 8 report projections, in
22 2020 and 2021 there will not be enough hydrogen fueling
23 stations to support the increase of fuel cell electric
24 vehicles on California's roads. Volkswagen's settlement
25 could allow for additional station buildout in time.

1 Which leads me to my third point.
2 California can not wait until the next round of
3 VW funding. Hydrogen infrastructure needs additional
4 support now. The CHBC believes that a lack of investment
5 in hydrogen infrastructure in this funding cycle will also
6 send a signal to other states, discouraging further fuel
7 cell electric vehicle adoption and limiting price
8 reduction benefits associated with higher production
9 volumes.
10 To conclude, the CHBC very much appreciates the
11 great work and immense support from the State's agencies.
12 It is mutual goal to improve the lives of Californians and
13 provide them with the choice of zero-emission vehicle
14 options. Therefore, we strongly believe that the Board
15 should require VW to submit a revised investment plan for
16 settlement moneys to be technology agnostic, provide
17 funding to help the State meet the increasing demand of
18 fuel cell electric vehicles, and to set the right example
19 for the rest of the nation to follow.
20 Thank you.
21 MR. DANGBERG: Good afternoon, Madam Chair and
22 members of the Board. My name is John Dangberg. I'm
23 assistant city manager here representing Mayor Darrell
24 Steinberg, who sends his regrets that he could not be
25 here. But he wanted me to speak on his behalf and voice

1 Sacramento's strong support for the Volkswagen Investment
2 Plan.
3 First, Sacramento is ready and has the ability to
4 deliver on this opportunity for the State and the
5 Sacramento region. This investment in Sacramento will
6 catalyze the advancement and use of ZEV technologies in a
7 manner that is rapidly scalable and transferable to other
8 areas of the State.
9 So why Sacramento? This would be a
10 transformative opportunity for the city of Sacramento and
11 our community. Sacramento is rated as one of the nation's
12 most diverse communities where people of color are the
13 majority. The CalEnviroScreen designates our
14 disadvantaged census tracts in the top 10 percent in the
15 state, and 84,000 people in Sacramento live in high
16 poverty census tracts.
17 This initiative will greatly strengthen
18 affordable clean mobility options, integrate workforce
19 development, and serve as a model for others.
20 We provide a rare opportunity to test programs
21 that can be replicated across a range of communities. And
22 as the State's capital, Sacramento is at the heart of
23 California's policymaking. Showcasing the State's capital
24 as a green city sends a strong message about the State's
25 commitment to sustainability and zero-emission vehicles.

1 Sacramento's readiness is built on our early
2 initial investments in zero-emission technologies and our
3 strong partnership with key organizations, including UC
4 Davis and other regional agency partners.
5 Among other important initiatives, work with key
6 partners resulted in our first regional EV readiness plan
7 in 2013 known as Take Charge; and a second phase is
8 currently underway.
9 While this is a good start, we are in need of a
10 concentrated investment to scale up our efforts and
11 achieve our share of statewide ZEV targets.
12 So I will conclude by saying we stand ready to
13 work with you and your staff and Volkswagen to grow the
14 market for ZEVs, test out innovative ideas that spread to
15 other areas of the State, and provide new transportation
16 options to low income residents in disadvantaged
17 communities.
18 Thank you very much.
19 MS. ROSIA-TREMONTI: Chair Nichols, members of
20 the Board. My name is Ashley Rosia-Tremonti. I'm the
21 Sustainability Manager for the city of San Diego. I
22 report directly to our city's chief sustainability
23 officer.
24 We were pleased to submit a proposal for the
25 invest -- VW investments back in January, and we are happy

today to submit comment on their first cycle investment plan.

Overall we would have preferred additional detailed justification and general transparency within the investment plan, though we are excited to see investments happening in the San Diego region. We do want to ensure that Volkswagen is taking into account local existing plans and that they are collaborating with local governments and local organizations. This will be key to the success of these individual projects.

Per example, San Diego regionally has an EV readiness plan already designed. It was developed by the San Diego Association of Governments and the Center for Sustainable Energy in collaboration with various cities, Caltrans, local labor, universities, the Port of San Diego, and others. It is unclear from the investment plan whether or not these types of plans were taken into account when identifying projects.

Continuing on with the topic -- the important topic of collaboration, I would like to call out figure 3 of the Investment Plan. It demonstrates the number of proposals submitted by region to Volkswagen. And we would like to emphasize that the number of proposals received does not necessarily indicate interest or need for EV investments. As we determined we would collaborate, the

1 City of San Diego reached out to outside organizations and
2 submitted a single proposal. So naturally we had fewer
3 proposals submitted to Volkswagen. But that does not
4 necessarily mean that we don't have the interest.
5 Through this proposal process, we have also
6 researched and determined that the city of San Diego
7 receives about one-third the amount of state funding on a
8 per-capita basis compared to other cities identified in
9 this investment plan, and 30 times less than the city
10 receiving the largest amount of state funding. We want to
11 take opportunities such as this one to close that gap and
12 see beneficial and wise investments made in our region.
13 Thank you.
14 MS. REYES: Good afternoon, Chair Nichols and
15 members of the Board. On behalf of Mayor Garcetti, I want
16 to thank the Board and Electrify America for the
17 presentation and their time, and also to thank Electrify
18 America for the positive recognition of L.A. in the
19 initial ZEV Investment Plan as being a region worth
20 receiving targeted investment.
21 L.A.'s Green City proposal came together as a
22 result of a coalition of organizations. We are the Green
23 City L.A. Coalition, and these members are here today --
24 some of the members, and will be expressing their support
25 and recommendations for why L.A. is ripe for the Green

1 City designation and investment.
2 I'm here on behalf of the city to urge Electrify
3 America and the Board to increase investment in L.A.
4 The Volkswagen settlement stems from a diesel
5 vehicle pollution. No one has been hit harder from diesel
6 pollution than the communities in Los Angeles. In L.A.
7 County alone it represents over half of the state's
8 disadvantaged communities according to the
9 CalEnviroScreen.
10 It says that the plan should prioritize
11 disadvantaged communities. The plan from Volkswagen
12 indicated that it's a secondary consideration.
13 Investments in cleaning our air and sustaining
14 livable and sustainable communities will not go to waste
15 in Los Angeles. Dollar for dollar, using funds for zero
16 or near-zero emissions are -- off of these projects
17 maximizes the reach of investments in transportation,
18 mobility, and infrastructure.
19 L.A. is a city that knows how to accelerate these
20 transformative programs. And we are here to help. The
21 Mayor's office in particular will be eager and excited to
22 work with Electrify America to make this happen within the
23 30-month period. We are ready. We have projects that are
24 shovel-ready for investments.
25 Simply put, we believe L.A. is ground zero for

1 the next iteration of urban mobility, technology, and
2 innovation. Investments in electrification are made --
3 you know, that are made in L.A. will be leveraged and
4 maximized in ways that are unequaled throughout the State.
5 Thank you for your time.
6 MS. NORTON: Good afternoon, Chair Nichols and
7 Board members. My name is Hilary Norton and I'm the
8 Executive Director of FAST, Fixing Angelenos Stuck in
9 Traffic, and Fast Links Downtown L.A.
10 (Laughter.)
11 MS. NORTON: Yeah, imagine my job.
12 So I'm also part of the Green City L.A.
13 Coalition. We're committed to transforming the region
14 through a partnership with Metro, the City of L.A., the
15 L.A. Cleantech Incubator, and Green Commuter through our
16 Fast Link DTLA program.
17 Our zero-emission micro-transit and van pools
18 connect to a growing ZEV transit network, encouraging
19 clean air travel and serving disadvantaged communities
20 with ZEV mobility.
21 I'm here to support L.A.'s application to be
22 selected as a Green City. As Susana said, we have over
23 half of the disadvantaged communities in California
24 region. But moreover, we have most of the impressions
25 that -- in this program and the goal to make heavy impact

with measurable results. We have 25 percent of the state's population, 47 million tourists a year, and 7.8 million vehicles currently registered, larger than 45 of 50 states.

Selecting Los Angeles will positively impact both mobility and health in disadvantaged communities. Granting L.A. the designation of Green City will deliver visible and measurable results in the first 30-month rollout, showing transformational change by leveraging L.A.'s existing ZEV momentum and the investment of Measure M funds toward sustainable travel and improved air quality.

As currently a plug-in EV owner, I'm excited for the proliferation of charging infrastructure and ZEV vehicles so that I can increase my -- reduction in my carbon footprint.

L.A. as a Green City will be California's best amplifier of the power of ZEVs, and we look forward to being supported as a Green City in this round.

Thank you very much.

MR. WRIGHT: Good afternoon, CARB members. My name is Jerard Wright, BizFed's Policy Manager. And BizFed is a grassroots alliance of more than 160 diverse business associations representing 325,000 businesses that employ 3 million people in L.A. County.

1 BizFed personally is -- not -- is technically
2 technology neutral in -- in its support -- or in its
3 mission on these items. And what we want to bring to the
4 table is that we believe L.A. is well suited for investing
5 in our transportation infrastructure, because BizFed was
6 one of the key members and key supporters of Measure M,
7 because we felt we were in it to win it for our
8 environment, for our economy -- most importantly for our
9 economy, because advancement of transportation
10 infrastructure such as this would infuse our local
11 economy, improve our environment, in making L.A. County a
12 more desirable place to live, work, and grow business.
13 Thank you so very much.
14 MR. SWORDS: Good afternoon, Chair Nichols and
15 members of the Board. My name is Michael Swords and I'm
16 the Vice President of Government Relations at the Los
17 Angeles Cleantech Incubator, or LACI.
18 LACI is a nonprofit public-private partnership
19 that helps support the growth of early-stage cleantech
20 companies. We are currently supporting 44 promising
21 cleantech startups, eight of which are advanced
22 transportation companies.
23 I am here as a member of the Green City L.A.
24 Coalition to express LACI's strong support for Los Angeles
25 to be selected as one of the two Green Cities under the

1 Volkswagen settlements.
2 Los Angeles has made tremendous progress in
3 cleaning its air over the last few decades. However, we
4 still have a lot of work to do. One only needs to take a
5 short drive on our congested freeways to see that the
6 challenge is still significant.
7 The city has rightfully made the electrification
8 of its fleets a priority. The city has also done a great
9 deal to educate the public about the benefits of the
10 electrification of transportation and has created several
11 programs designed to accelerate the rollout of electric
12 transport.
13 VW's investment could be truly transformational.
14 VW's investment could help us transform that challenge by
15 getting people out of single-car ridership and into
16 ride-sharing and car-sharing options, especially in
17 disadvantaged communities.
18 The city of L.A. owns and operates its own
19 airport, port, and utility, allowing the city to move
20 faster in accelerating VW's ZEV investment.
21 The city also has shown significant commitment
22 and leadership in sustainability and has champions at all
23 levels of government, willing and eager to work with VW to
24 accomplish the ZEV infrastructure and vehicle deployments.
25 For all these reasons, we urge you to include

1 L.A. as one of the first two Green Cities as part of this
2 round of ZEV investment.
3 Thank you.
4 MS. ANDERSON: Good -- I almost said good
5 morning.
6 Good afternoon, Madam Chair and members of the
7 Board. I appreciate -- my name is Marco Anderson. I'm
8 with Southern California Association of Governments. And
9 I'm here today to express support for the city of Los
10 Angeles being selected as one of two Green Cities in the
11 State.
12 I think it's important to note a number of people
13 have already stressed the strengths of Los Angeles as a
14 city. And also I'd like to add the growth of Los Angeles
15 as a regional partner. I don't think seven years ago I
16 would have been authorized by my leadership to come here
17 and advocate for one city over another city. But as we've
18 seen, the region has grown to understand that investments
19 in Los Angeles benefit the region and as well as the
20 diffusion of technology.
21 I think the Green Cities category is about more
22 than just putting charging stations in the ground. So
23 SCAG very much appreciates the investment in the growth of
24 infrastructure, which will allow us to meet our regional
25 GHG reduction targets as well as ARB's vehicle mandate

1 targets. However, the Green Cities is about the full
2 transformation of the entire mobility ecosystem.
3 SCAG had looked extensively at vehicle
4 electrification and also about the revolution that's
5 taking place in car sharing and the future of automated
6 vehicles. If we are to ensure that automated vehicles and
7 car sharing and robo-taxis, whatever form they take, are
8 electrified, it'll require an infrastructure and it will
9 require data and technology that adapts to that
10 infrastructure.
11 The other thing I'd like to highlight is people
12 have mentioned the fact that Los Angeles has its own
13 utility and port. It also is a transit operator and it
14 also owns the curb space that Metro relies on. Adding all
15 those things together, the last thing I'd like to
16 highlight is the city agencies such as LADOT and the
17 LADWP, they've been at the table. Across the state
18 agencies programs are asking for collaboration for team
19 building. There's only so many times you can marshal
20 those teams and come in second. But we keep doing it with
21 federal grants, with statewide grants. And we're hoping
22 to be successful in having a source of funding that that
23 coalition can use to sustain itself.
24 So thank you very much for your consideration.
25 CHAIR NICHOLS: It's Bill Magavern. That's you.

1 MR. MAGAVERN: Thank you. Bill Magavern with the
2 Coalition for Clean Air.
3 I've been very impressed with ARB's response to
4 Volkswagen's criminal conspiracy. You caught them. You
5 enforced against them. You negotiated a favorable
6 settlement. And I think that the way that you're going to
7 choose to invest the resulting funds will probably follow
8 the same kind of success.
9 I also saw -- in the last couple weeks saw Ellen
10 Peter testify to two different legislative hearings on
11 this issue, and she did a superb job both times.
12 If Volkswagen's recovery from its self-inflicted
13 wounds would be to transform itself from a diesel car
14 company into an electric car company, I think that would
15 be an excellent result.
16 As we look to how they invest these funds, I want
17 to emphasize the importance of investing in disadvantaged
18 communities. I hope that they will exceed the levels that
19 are in your guidance document.
20 We came together three years ago with a number of
21 allies to start the Charge Ahead California campaign and
22 worked with Senate President Pro Tem de Leon on
23 legislation which has the goal of giving access to the
24 cleanest vehicles to those in the most disadvantaged
25 communities. So we think this source of funds is another

1 additional way to augment that; and not only when it comes
2 to light duty but also to get some of the cleanest
3 heavy-duty vehicles into those communities.
4 And in addition, we agree with those who have
5 said that we think hydrogen fuel cell infrastructure
6 should also be included in the funding.
7 Thank you.
8 MS. KINMAN: Good afternoon. I'm Michelle Kinman
9 with Environment California Research & Policy Center, a
10 statewide environmental organization based in Los Angeles.
11 I haven't had the opportunity to review the
12 proposals submitted by other cities, but I did want to
13 express my support for the strength of the proposal
14 submitted by Los Angeles.
15 As we all know, L.A. consistently ranks as having
16 the worst air quality in the nation. And as we all know,
17 L.A. is an incredibly important market for vehicle
18 electrification with a large consumer market.
19 The city is also the first major city to have an
20 electric vehicle car-share pilot in disadvantaged
21 communities. And I've had the opportunity to work with
22 the city firsthand on the development of this pilot
23 program and I'm greatly impressed by the mayor and the
24 city's demonstrated leadership and commitment to an
25 electrified future.

The city worked with a diverse stakeholder group to develop their Green City proposal, resulting in a transformative proposal that would concentrate investment on shovel-ready projects in communities that need it most: Downtown, South L.A., Boyle Heights, Wilmington, Pacoima, and LAX. These areas are some of the most disproportionately impacted by vehicular pollution and could benefit tremendously from ZEV investments.

For all of these reasons we strongly support L.A.'s application to be selected as a Green City under the Volkswagen settlement.

Thank you.

MR. TEEBAY: Good afternoon, members of the Board. Thank you for allowing me to speak. My name is Richard Teebay. I am employed by the County of Los Angeles. I have worked with members of your staff for almost two decades, and my experience, they have been committed, dedicated, helpful, and open.

Last August I spoke with some of you at the Cleantech Incubator in downtown Los Angeles. I was advocating for EV infrastructure for disadvantaged communities. And I was politely told that ARB doesn't fund EV infrastructure. As of today, you certainly influence the funding of the EV infrastructure.

It's appropriate that you're in Riverside. It

1 serves as a dramatic backdrop for the work that you've
2 done at this meeting. This region of six counties within
3 SCAG are home to 18 million of the State's population,
4 almost half. The region consistently has the worst air
5 quality in the nation, not just the State. There's a
6 significant and obvious need for accelerating the
7 transition to zero-emission vehicles.
8 The city -- or the county supports the city's
9 application to be the clean city. Think of the world
10 stage for a moment. Think about the Super Bowl in 2019.
11 Think about the Olympics in 2024. You have a really
12 wonderful opportunity to showcase what a zero-emission
13 future looks like.
14 I'd also like to remind you that in L.A. County
15 alone there were 7.8 million registered vehicles in 2015.
16 That's more vehicles than there are people in the Bay
17 Area.
18 We are a strong advocate for infrastructure in
19 this region, especially in our disadvantaged communities.
20 One quick thought, and then I'll shut up, is
21 this has been totally silent about fleet. And I would
22 love to have a question asked about the fleets and the
23 impact that they can have. I've studied two fleets, the
24 County's and Metro's, And I can speak to that.
25 CHAIR NICHOLS: So just to be clear. Electrify

1 America will be testifying. They're the last on the
2 entire list. And we're gathering questions. I'm sure
3 we'll have many questions for them.
4 MR. TEEBAY: That's fine. Thank you.
5 MR. CAZERAS: Good afternoon, Board members. My
6 name is Fernando Cazeras and I'm the California manager
7 for Climate Smart-Cities at the Trust for Public Land.
8 I'm here to express our strong support for our Climate
9 Smart-Cities partner, the City of L.A., to be selected as
10 a Green City.
11 I'm also a member of the Green L.A. Coalition.
12 While we believe as an organization that part forests and
13 natural lands are important to climate mitigation and
14 resilience. We also know that Transportation is a latter
15 source of greenhouse gases and air pollution in L.A. As a
16 native Angeleno, I also believe that L.A. is on right path
17 to overcome our transportation, air quality, and land-use
18 challenges. But I believe that we need L.A. and the
19 region to resist transformation much quicker.
20 Heat waves are expected to significantly increase
21 in the L.A. Basin, significantly worsening the
22 ground-level ozone and air pollution that already caused
23 too many asthma attacks.
24 Volkswagen's investment presents a unique
25 opportunity to make transformative change in three ways:

1 Helping Angelenos with limited resources get out
2 of car ownership and into ride sharing and car sharing is
3 transformative in its own way.
4 Converting gasoline and diesel vehicles into ZEVs
5 and building out the necessary infrastructure to support
6 those vehicles, and accelerating ZEV freight investment is
7 an area that we believe will achieve Volkswag -- will
8 enable Volkswagen and CARB to achieve the most impact for
9 the funding.
10 I also want to make a note not to get into the
11 weeds, but being in California, I really encourage you to
12 think about this multilingual education and awareness
13 campaign that Volkswagen is able to do, that we make sure
14 that it's culturally and linguistically appropriate. We
15 do have many languages in California.
16 So for these and many other reasons, I urge you
17 to select L.A. as one of the first Green Cities this first
18 round.
19 Muchas Gracias.
20 MS. OHLAND: Good evening, members of the Air
21 Resources Board. My name is Gloria Ohland and I work for
22 Move L.A., and we care deeply about sustainable
23 transportation. I know some of you know our Executive
24 Director, Denny Zane. And we're a very big, broad
25 coalition of civic leaders who were the impetus behind the

1 Measure R Transportation and Sales Tax measure in 2008.
2 And the Measure M Transportation and Sales Tax won 72
3 percent of the vote last November.
4 And I'm here as a member of the Green City L.A.
5 Coalition to urge you to invest that VW settlement money
6 in L.A.
7 Move L.A. is on a steering committee of L.A.'s
8 brand new low income EV car-share project that's opening
9 for business in two to three months; and we've begun
10 outreach in neighborhoods to drum up interest. And I was
11 at one of the meetings on Wednesday night and I was
12 sitting next to a woman who had been playing around with
13 CalEnviroScreen 3.0. And she had found some numbers that
14 made a very compelling case for why disadvantaged
15 neighborhoods in the pilot project area of our car share
16 need EV car sharing. In her neighborhood, for example,
17 the pollution burden was very high, at 92 percent, which
18 my understanding is that means that only 8 percent of all
19 the census tracts in California have more pollution than
20 her neighborhood.
21 The diesel index was 98 percent. The PM2.5 index
22 was 80 percent. And the neighborhood is very poor. 96
23 percent of households are considered housing burdened.
24 And I don't really know that much about air
25 pollution. But I do know that diesel is a toxic

1 contaminant, it contributes to NOx, and it sticks to
2 particulate matter which gets lodged in people's lungs and
3 it's probably second only to cigarettes as cause of
4 cancer.
5 And there are a lot of kids in that neighborhood
6 and there's a big community college.
7 And I know that diesel messes with low income
8 people who live near freeways and heavily traveled
9 transportation corridors with lots of truck traffic. And
10 that's almost all of L.A.'s neighborhoods.
11 So we at the Green City Coalition believe this is
12 exactly the environment that you should invest the VW
13 settlement money in.
14 CHAIR NICHOLS: Understood. Thank you.
15 It's not our money to invest though. Just again,
16 to be clear, we're not investing it. It's their money.
17 MS. OHLAND: Oh. I wish you were.
18 CHAIR NICHOLS: Sorry.
19 Okay. Please, you're done.
20 MS. OHLAND: Okay. Well,
21 CHAIR NICHOLS: Other people are waiting.
22 MS. OHLAND: The only thing I was going to say is
23 we're shovel ready in L.A. with our low-income EV
24 car-sharing --
25 CHAIR NICHOLS: Move L.A. is a great

1 organization, and we appreciate your work. Thank you.
2 MS. BARBERENA: Good afternoon, Chair Nichols and
3 members of the Board. My name is Betty Barberena and I am
4 the outreach manager for the Electric Vehicle Car-share
5 Program coming soon to Los Angeles.
6 As part of the steering committee comprised of
7 community-based organizations, SALEF, KIWA, TRUST, and
8 South L.A., we are working along with the city and Blue
9 L.A. to make sure that this innovative program benefits
10 disadvantaged communities highly affected by
11 transportation-related pollution.
12 L.A.'s vehicular pollution comes from two primary
13 factors. The fact that L.A. is the largest vehicle market
14 in the State; and our port, which is the largest in the
15 U.S. VW ZEV Investment presents the unique opportunity to
16 address these primary factors by helping people get out of
17 their single car ridership and into ride share and car
18 share, especially in disadvantaged communities.
19 The car-share program we are getting ready to
20 implement will provide low income residents of Westlake,
21 Pico-Union, Echo Park, Downtown L.A., and parts of Korea
22 Town with access to clean and reliable transportation
23 because the vehicle fleet will be 100 percent electric
24 with publicly available infrastructure.
25 The community forums we held recently showed how

1 ready these communities are for ZEVs and the corresponding
2 infrastructure, and to get rid of their diesel vehicles.
3 Selecting L.A. as one of the first Green Cities
4 will allow VW to maximize its impact by leveraging
5 hundreds of millions in both public and private funding to
6 mitigate diesel emissions in communities that need it the
7 most, to accelerate deployment of ZEVs and the required
8 infrastructure.
9 So as part of a Green City L.A. Coalition, I urge
10 you to include Los Angeles as a Green City as part of a
11 first round of ZEV investments to achieve maximum impact
12 for transportation electrification and emissions
13 reductions.
14 Thank you.
15 CHAIR NICHOLS: Thank you.
16 MS. HALLS: Good afternoon, Chair Nichols and
17 members of the Board. My name is Cassie Halls and I'm a
18 project associate at the Shared-Use Mobility Center, a
19 technical advisor to the L.A. Department of
20 Transportation. I'm representing the Green City L.A.
21 Coalition.
22 Volkswagen's ZEV Investment Plan represents an
23 unparalleled opportunity to foster growth of Clean
24 Transit, EV Car Share, and other shared mobility programs.
25 If disadvantaged communities are to be put front and

1 center, it is critical that these programs should be put
2 front and center as well.
3 Investments in EV and shared mobility go a long
4 way. Each car in an EV car-share program is rented six to
5 seven times per day, maximizing investments in EV
6 infrastructure for the greatest public benefit. It is
7 modeled that one EV car-share car can take 9 to 13 carbon
8 emitting diesel and gasoline cars off the road. Our
9 groundbreaking EV car-share pilot program funded by your
10 agency is now under construction and will launch later
11 this year in L.A.
12 This program will serve over 7,000 households,
13 over half of which are low income. Volkswagen funding
14 could help scale this program and others like it 10 to 20
15 times the current size over the next 10 years, maximizing
16 its impact on improving air quality and filling critical
17 mobility gaps in Los Angeles's poorest and most polluted
18 communities.
19 Our share and mobility action plan for L.A.
20 County calls for growing EV car share to 2,000 vehicles,
21 which could serve over a hundred thousand Angelenos and
22 could help reach our goal of taking a hundred thousand
23 cars off the road.
24 Los Angeles has made rapid strides around a wide
25 range of public-private investments in shared mobility

that have gained national attention.

In addition to the EV car share program, four cities of Los Angeles have launched bike share programs in the last year, and both the city of L.A. and L.A. Metro are planning micro-transit --

CHAIR NICHOLS: Okay. Thank you. Not taking a breath does not extend your time. --

(Laughter.)

MS. HALLS: Can I just say one last thing?

Yeah. I just wanted to say that Los Angeles is the place to look, and we know how to invest in disadvantaged communities.

CHAIR NICHOLS: Yes, you do.

MS. HALLS: Thank you for your time.

CHAIR NICHOLS: All right. And you know something. I just have to say, because I'm a resident of Los Angeles and I love Los Angeles. If the issue was who had organized, you know, the most people to make a pitch, you guys would already have won. Okay.

So just know that. You're doing a great job and you're doing a lot of good work. So this is all good, and I think it will not be a waste no matter what happens.

MR. CORTES: Chair Nichols, Board members, thank you so much for allowing me to address you this afternoon. My name is Carlos Cortes. I'm director of engineering at

1 Broadband TelCom Power. We are an AC and DC fast charger
2 manufacturer located in Orange County. We build mostly DC
3 fast chargers. We have roughly 500 DC fast chargers
4 nationwide.
5 I wanted to come in in support -- in strong
6 support of the Volkswagen ZEV Investment Plan, for a lot
7 of reasons. The first one is, every single DC fast
8 charger we have in the state of California is being
9 heavily used. That's item number 1.
10 We do have a lot of good reasons why we want to
11 install additional DC fast chargers. The first one is
12 because it's really a drop in the bucket as far as the ZEV
13 investment plan. We need so much infrastructure for the
14 one million vehicles that are mandated to be out on the
15 road, that the $800 million investment is really a drop in
16 the bucket as far as what we need for infrastructure. And
17 we can see it in the number of transactions that we get on
18 a per-charger basis in the state of California. So that's
19 number 1.
20 Number 2. We see that the ZEV Investment Plan is
21 really inclusive of a lot of different parties and a lot
22 of different systems, and we do see it as being a system
23 that can actually be utilized in underserved communities.
24 Okay?
25 And then last, and I think the critical point in

this whole thing is, we really have truly a chicken-and-egg situation. In order to get more cars out on the road, we need charging systems out on the road. Right? But what we do know because we have the experience in actually installing DC fast chargers, we do know that DC fast chargers by themselves to date don't financially pay for themselves. They don't. So we need government intervention. We do need your help to push forward the investment into electric vehicle charging infrastructure and network so that we can get the electric vehicles out on the road.

Thank you so much.

CHAIR NICHOLS: Thank you.

MR. ZHENG: Good afternoon, Chair Nichols and Board members. Thank you for the opportunity to make a statement at this hearing. My name is Kevin Zheng and I work for SemaConnect.

SemaConnect is a leader in developing, manufacturing, and delivering network EV charging solutions for commercial properties in North America.

SemaConnect's statement is as follows:

The Volkswagen settlement decree represents a unique opportunity to accelerate the EV market in California. Expanding this market would create jobs and a new economic opportunity, help California achieve its

1 climate mitigation goals, and protect the health of
2 disadvantaged communities who face the worst effects of
3 tailpipe pollution. With that as context, SemaConnect
4 strongly supports Volkswagen's first California ZEV
5 Investment Plan. We feel it successfully meets the goals
6 of the settlement decree. We urge CARB to approve the
7 plan as soon as possible.
8 Also we are concerned that the full perspective
9 of the EV charging industry has not been well communicated
10 to the policymakers and other stakeholders so far on this
11 issue.
12 Our company and our EV industry partners are
13 committed to competition and understand how the Volkswagen
14 California ZEV Investment Plan as it is currently written
15 will be beneficial to the public and the industry.
16 As you know, Appendix C of the settlement decree
17 establishes a California ZEV investment plan which
18 requires Volkswagen to invest 800 million in California
19 over the next 10 years.
20 We applaud CARB for securing this requirement as
21 part of the settlement agreement. Along with the rest of
22 the settlement, we believe that Appendix C is an effective
23 mechanism for achieving important public benefits
24 including increasing the rate of adoption of EV cars.
25 California has always been the global leader in

1 moving automotive market towards a cleaner, more efficient
2 future.
3 CHAIR NICHOLS: Thank you. Your time is up.
4 MR. ZHENG: Thank you. Thank you much.
5 MS. ALI: Good afternoon, Chair Nichols and
6 members of the Board. My name is Fariya Ali and I'm
7 speaking on behalf of Pacific Gas & Electric, the PG&E in
8 California.
9 We would also like to congratulate the ARB
10 engineers on staff for their important role in actions
11 taken to enforce emission standards.
12 PG&E supports the increase in electric vehicle
13 infrastructure that the Volkswagen Zero-emissions Vehicle
14 Investment Plan represents and we encourage expediency in
15 approval to allow for a quick start to implementation.
16 The path to achieve the State's air quality and
17 climate goals will require a major increase in electric
18 vehicle adoption. We believe that some of the proposals
19 in the ZEV Investment Plan will complement actions being
20 taken by PG&E and other utilities to advance the State's
21 EV infrastructure to support this objective.
22 Another opportunity will be to use greenhouse gas
23 reduction funds for EV and infrastructure incentives in
24 disadvantaged communities.
25 PG&E's recently approved $130 million EV Charge

1 Network Program is one of the largest single deployments
2 of EV charging infrastructure in the world. And we
3 recently proposed an additional $250 million to support
4 the deployment of DC fast chargers and non-light-duty
5 electric vehicle charging infrastructure.
6 Even with these investments, much more is needed
7 to meet the Governor's goal of developing EV
8 infrastructure to support one million vehicles by 2020,
9 and we hope to see more action to support this goal soon.
10 Thank you.
11 DR. REICHMUTH: Chair Nichols and members of the
12 Board. Good afternoon. My name is Dave Reichmuth. I'm
13 speaking on behalf of the Union of Concerned Scientists.
14 The VW cheating scandal is unprecedented, and
15 this settlement is critical to repair the damages done.
16 I'd like to thank the Board and VW for moving
17 this process forward quickly. We don't want to rush in
18 making these investments, but we definitely want to move
19 expeditiously. These investments need to go forward as
20 soon as possible.
21 We're still reviewing the document and we'll
22 submit written comments later. But we do agree with the
23 comments that were made in terms of the need for hydrogen
24 infrastructure, especially to achieve the brand neutral
25 ZEV infrastructure requirement of the settlement.

We also agree with the initial focus on DC fast charging in corridors and multi-use dwellings. It makes sense. But we need to make sure that we're actually serving disadvantaged communities with those investments, to make sure they're in the right places.

We'd also want to make sure that these investments coordinate with other actors in this area, especially utilities and charging providers. This investment needs to be complementary to what else is going on in the State. It's a large amount of money, but it's only a fraction of what needs to be invested in terms of the private and public funds. So we want to make sure that this doesn't duplicate or inhibit other programs that are already ongoing.

Thank you.

CHAIR NICHOLS: Thank you. We agree.

MR. SULLIVAN: Good afternoon, Chair Nichols and Board. My name's Joseph Sullivan. I work for the International Brotherhood of Electrical Workers in the National Electrical contractors Association. And than you for the opportunity to comment.

Volkswagen's investment represents a substantial opportunity to support California's climate goals, benefit our hardest-hit communities, and create good middle class jobs.

1 Unfortunately the Cycle 1 Investment Plan fails
2 to optimize this opportunity fully. There's no
3 description of how the investment in EV infrastructure
4 will create pathways into skilled training in middle-class
5 careers, by leveraging the State's joint labor management
6 electrical apprenticeship network, by creating
7 family-sustaining jobs with good wages and benefits, by
8 hiring workforce from disadvantaged communities, low
9 income households of veterans. We can either use this
10 money for this infrastructure build-out to create
11 temporary jobs or we can create life-long careers with
12 training and family-sustaining wages.
13 Lastly, the plan doesn't outline how Electrify
14 America will ensure that the ZEV infrastructure will be
15 installed and maintained by qualified electrical personnel
16 and contractors in accordance with State law and industry
17 best practice.
18 Thank you.
19 CHAIR NICHOLS: Again, just to be raising the
20 issue here. There is no prohibition in terms of using
21 money over many of these projects towards training of
22 people who would be doing the work on them, as far as I
23 can tell anyway.
24 CHIEF COUNSEL PETER: Not that I can recall.
25 CHAIR NICHOLS: Yeah. I think it's an important

1 point though, that the opportunity goes beyond just an
2 investment in hardware or even in jobs but in really
3 multiplication if it's done well.
4 Thank you.
5 MR. SHEARS: Good afternoon. John Shears with
6 the Center for Energy Efficiency and Renewable
7 Technologies.
8 First thing I'd like to share the observation
9 that I think that you've spoiled us, CARB, and the way
10 CARB normally workshops processes. Because I do have a
11 complaint in terms of how top down and relatively opaque
12 the development process has been around these
13 investment -- this investment plan.
14 And I hope that going forward for the next round
15 we can maybe figure out how to work with Volkswagen to
16 make that a much more transparent process.
17 What I'd like to recommend in the interim is that
18 there's at least one more, if not two more, public
19 workshops. But given the timeline, we're probably looking
20 at one to air things out more. Because I'm sure all the
21 stakeholders who would want to participate so that we
22 could have a more free back and forth -- or were available
23 in the Senate oversight hearing that Ellen did a masterful
24 job at, that you couldn't watch it live.
25 So just wanted to share that observation.

1 Also disappointed -- or we're disappointed
2 about -- over hydrogen and the lack of mention in there.
3 I want to also point that work -- I work with
4 Peter Cooper at the employment training panel on the
5 employment issue. A letter was submitted, was also shared
6 with CARB staff that we need to incorporate that in as the
7 market grows because we need to have workers who can
8 facili -- work on the vehicles and the infrastructure
9 going forward, and that's got to keep pace.
10 And then, finally, I work in the Central Valley.
11 The major metropolitan areas are not the only areas that
12 have disadvantaged communities. And the most challenging
13 environment from my take because of the capacity issues
14 that are lacking in the Central Valley is that that's --
15 that's a real concern. And what I see in this investment
16 plan is it's sort of like, you know, fly over country in
17 terms of how people talk about nationally. I see the
18 valley. And what I see in this investment plan is
19 drive-through or drive-by country.
20 So if we could deal with that, that would be
21 great.
22 CHAIR NICHOLS: Thank you.
23 MR. MUI: Simon Mui, NRDC. First, thank you to
24 your staff and all of you for bringing light to what has
25 been a dark chapter in the auto industry in terms of the

1 scandal here.
2 We did want to reinforce that we like what you're
3 doing in terms of making sure that the VW investments are
4 complementary and additional to what utilities are going
5 to do. We want to see 1 + 1 = 2 and not 1 + 1 = 1.5.
6 And we think you are doing a good job and want to
7 encourage ARB to continue doing that to make sure that
8 those investments are complementary to what charging
9 service providers as well as utilities are doing.
10 Finally, we want to thank you as well for
11 California's role in this -- in uncovering the VW scandal
12 and really putting California in a much better place
13 versus other states. We work in those other states and
14 they are very envious of the special treatment California
15 enjoys under the consent decree terms. We're only about
16 12 percent of the U.S. market, but the consent decree
17 carves out 40 percent of the Appendix C funds for
18 California. No other state has that kind of certainty.
19 They're all clamoring for VW to come to them.
20 In sum, this is a good deal for California.
21 We do think that ARB should make sure to exercise
22 its oversight on VW's investment plan to ensure they're
23 consistent with the guidance ARB has provided in the terms
24 of the consent decree. And this is very critical, because
25 many are asking for changes. And we just want to make

1 sure that you're careful to avoid asking for modifications
2 to the proposal that could reopen this and require the
3 parties to go back to the judge, resulting in potentially
4 many years of delay in opening up this deal.
5 So in sum, thank you. We like this deal. And we
6 want to prevent it from going back to the Feds.
7 MR. WHEATLEY: Chair Nichols, members and staff.
8 Thank you very much for this opportunity, and thank you
9 for everything that you do to make California this
10 wonderful leader in terms of making the world a better
11 place to live in.
12 I am predictably going to harp on about the fact
13 that we need to be using renewable energy as the primary
14 source for our considerations around ZEV infrastructure,
15 not as an afterthought as it so often is.
16 There is a commercially available and in use
17 today transportable solar-powered electric vehicle
18 charging station which requires no trenching, no
19 foundations, and it is deployed in less than 12 minutes
20 instead of less than 12 months. It was mentioned earlier
21 by Supervisor Serna an by Dr. Sherriffs. Thank you for
22 that.
23 And you yourself, Chair Nichols, have had the joy
24 of driving on sunshine after charging your own electric
25 vehicle on one of these products. Products which, by the

way, was also delivering emergency energy to the city of Los Angeles in the event of a disaster. So that was a wonderful dual use there. Manufactured in California by a team of combat veterans and very worthy of this program.

Now, I arrived here this morning in a pretty filthy mood. In fact, I was imagining all sorts of horrible scenes from Braveheart. Not the romantic ones. And that was because yesterday I received an email which led me to believe that Volkswagen was not intending to use solar in any of their deployments of electric vehicle charging infrastructure.

However, I met with representatives of Electrify America this morning, and they assured me that that's not the case and I was wrong. And unlike William Wallace, I'm prepared to admit it when I'm wrong. So delighted to see that it isn't the case and that we are going to be doing that.

What I would like to see happen is that everything is done to encourage the use of renewable energy, both in this program and anywhere else. And specifically that nothing exists in the language or within the creditable expenses or any of the other parts of the program which might prevent it or discourage it. So please help Electrify America and help everybody else to make sure that we can drive on sunshine because that is,

after all, the ultimate promise of this technology.

Thank you.

MS. TUTT: Good evening, Chair, Vice Chair, members of the Board.

CHAIR NICHOLS: It's still afternoon.

MS. TUTT: No, after 5:00 I think that's evening.

So I'm Eileen Tutt with the California Electric Transportation Coalition. We've been around for decades in support of electrifying everything.

(Laughter.)

MS. TUTT: So I do -- you have a handout, hopefully, from the clerk. I just want to say that the handout -- I'm not going to go through it -- it's quite lovely though. I encourage you to read it. But it does show that we -- that our assessment agrees with the CARB staff assessment that the need for charging in this State -- and our assessment was only up to a million vehicles, which by the way is nowhere near where we need to be. So even just getting to a million vehicles, we are woefully underfunded in infrastructure. And we agree, VW and, I would say, NRG together is less 10 percent of the need in California just to make the one million vehicle mark, which is far short of where we need to be.

I also want to say that I'm really excited to see the outreach and education component in the Electrify

1 America. We keep talking about infrastructure, but that
2 is really, really important. I think that -- I'm really
3 looking forward to seeing what they do.
4 We're not going to pick a city for Green City.
5 But I did like what they were doing in terms of last mile
6 delivery, shared mobility and taxis. We think it's very
7 important to expedite the -- getting this money out. We
8 don't want to see another NRG.
9 And then, finally, on Appendix D - I know that's
10 not the topic - but we do want to see electrification of
11 the medium- and heavy-duty vehicle sector with that money.
12 So hope -- you'll consider that one when you're looking at
13 how to spend it.
14 Thank you.
15 CHAIR NICHOLS: Thank you.
16 MR. ASHLEY: I'll say good afternoon, Chair
17 Nichols and members of the Board.
18 CHAIR NICHOLS: I wasn't ready to face up to it.
19 (Laughter.)
20 MR. ASHLEY: So I'm Tom Ashley. I'm Senior
21 Director of Government Affairs and Public Policy with
22 Greenlots. Greenlots is a leading provider of smart and
23 electric vehicle charging software and services,
24 headquartered in the great city of Los Angeles.
25 I wish to just really emphasize to members of the

1 Board how much of an infrastructure deficit we have in
2 this State, and really in all communities and all
3 geographies across the State. I just cannot emphasize
4 enough how far behind we are and therefore how important,
5 you know, every dollar of investment is in the space, very
6 much including the proposed ZEV Investment.
7 And like many of other voices from the industry
8 that you heard before me, we really feel that we're at a
9 stage of the market where what we need to be striving for
10 more than almost anything else is to scale up where we are
11 in the market and provide opportunities across the market
12 for companies like my own and all types of different
13 communities and drivers. We very much look forward to the
14 Board's approval of the ZEV Investment Plan.
15 Thank you.
16 CHAIR NICHOLS: Mary Kathryn is next -- Mary
17 Kathryn Campbell and then Anne Smart.
18 If she's not here, then it's you, Anne.
19 Hi. Welcome back.
20 I'm going to save you at least a few seconds,
21 each one of you, by having you not introduce yourself
22 because -- or say good afternoon or good evening, because
23 we already know that. Just plunge right in.
24 MS. SMART: Thanks. Well, I'm sure you're all
25 happy to see me up here again on this topic.

1 But there's really only one issue that I would
2 like to discuss today, and that's making sure that the
3 rising VW tide lifts all California's boats.
4 It is difficult to sell a charging station in the
5 city that doesn't already have EVs on the roads or in
6 their local dealerships, and when a local driver's image
7 of a new EV is a car in an affluent suburb and not in
8 their own driveway.
9 The unprecedented $800 million could help
10 underserved communities in California reap the benefits of
11 EVs and help drive demand for automakers across the state.
12 But unfortunately, as written, VW's proposal ignores this
13 opportunity. Instead this is a business plan allowing the
14 largest automaker in the world to inject itself in
15 California's EV charging market and profit from its
16 wrongdoing.
17 Look at where VW's plan investments are going:
18 San Francisco, San Jose, Los Angeles, Sacramento, and San
19 Diego. And which are California's strongest EV markets
20 right now: San Francisco, San Jose, Los Angeles, and San
21 Diego. Where's Fresno in this plan? Where's Stockton,
22 Modesto? Where are those communities that really need ZEV
23 integration in their communities the most?
24 One of the biggest innovations in EVs is how they
25 can integrate into our community and provide benefits for

1 drivers and site owners alike. EV infrastructure is the
2 most helpful to the most people in the communities
3 themselves, not just as an off-ramp or on-ramp on a
4 highway.
5 So these highway corridors for those residents,
6 are they for the residents that live there or are they for
7 drivers just passing through on their way to the beach or
8 Tahoe? We really need to make sure that these stations
9 also per -- charge all EVs and not just the most expensive
10 models.
11 I ask that you please reject the proposal before
12 you and instead ask VW to follow its own guidance and the
13 guidance that you have before you to invest in
14 disadvantaged communities and offer grants or rebates to
15 site hosts to let them choose, not VW, the equipment that
16 they want, the business models they want, and the
17 technology they need to grow us well beyond the limited 10
18 percent that you are suggesting this market will be.
19 Thank you for your time.
20 MS. GALE: I'd like to thank Anne for her
21 comments.
22 I'll save the niceties. Central Valley Air
23 Quality Coalition.
24 I'd like to speak today about specifically where
25 this investment is being made in the State. Our biggest

1 concern is that the plan does not prioritize disadvantaged
2 communities. This Board had urged VW to dedicate a
3 significant percentage of the funds, at least 35 percent,
4 to disadvantaged, low income, and disproportionately
5 impacted communities. However, this plan does not make
6 that commitment.
7 For instance, in the San Joaquin Valley, chargers
8 are only placed alongside the highways, ignoring the
9 opportunity to invest directly into our communities.
10 Ms. Holmes-Gen from American Lung spoke earlier
11 today about the health benefits of zero-emission vehicles.
12 ZEVs save lives. So it only makes sense that we're
13 investing in the communities that need it most. And as
14 some have already said, this plan treats a lot of the
15 valley cities like drive-by communities.
16 In addition, the plan also anticipates the launch
17 of the Green City initiative to be Sacramento. And I
18 personally love the city of Sacramento. It's wonderful.
19 But we all know that that is not where the need is.
20 And I was going to launch into all the statistics
21 on why -- on how the valley is the most -- has the most
22 polluted cities in the nation and has the most
23 disadvantaged communities in the State. But I know this
24 Board knows all of those statistics and knows the need
25 that we have.

1 So in conclusion, I suggest that this Board
2 mandates a 35 percent commitment of the 45 million for EV
3 chargers to be located in disadvantaged communities. And
4 I also ask CARB to reevaluate the Green City proposals. I
5 know that the plan says that the next Green City will be
6 in a disadvantaged community. But I would hate for that
7 to be an either/or of Bakersfield and Los Angeles or
8 neither.
9 So I'd really -- I think it's important for ARB
10 not to pass up the opportunity to be investing in the
11 communities that need it most.
12 Thank you.
13 And I'd also like to say that I'd love if there
14 were 5, 10, 15 of me here today. But know that I
15 represent the 4 million people who suffer from poor air
16 quality.
17 Thank you.
18 CHAIR NICHOLS: Could we please have whoever is
19 doing the timer restart the timer. I don't know what
20 happened. But you need to change it so that Mr. Whiteman
21 gets his full time.
22 Very good.
23 MR. WHITEMAN: Shortly after the financial
24 details of Appendix C were announced late last year,
25 rather than stepping back and allowing this funding to

1 take our place, Tesla doubled down on its infrastructure
2 investments announcing a 100 percent increase in the
3 number of superchargers between end of year 2016 and end
4 of year 2017 in order to support the rollout of the Model
5 3, our $35,000 sedan to be built in Fremont and due on the
6 market later this year.
7 The value and need for EV infrastructure to
8 support long distance travel can not be overstated.
9 Several scientific and many more nonscientific poles point
10 to the supercharger network as a major reason consumers
11 choose to purchase a Tesla. As the EV market moves from
12 early adopters to mainstream consumers, the need for
13 pervasive and accessible charging stations will continue
14 to grow.
15 The proposed California Investment Plan offers a
16 robust path forward, bringing EV infrastructure to drivers
17 where they are and taking them where they want to go.
18 DC fast charging is important for long distance
19 travel and combined with level 2 workplace and community
20 focused DC charging as outlined in the plan, EV adoption
21 can become a reality for those lacking off-street parking
22 or who are transient renters.
23 Through its own experience, Tesla can affirm the
24 value these investments will have across the EV community.
25 As a company famous for never advertising, we have allowed

1 infrastructure investments to be our voice in communities
2 all across the State and country. When people see EV
3 chargers in their community and, even better, when they
4 see them in use, they are more inclined to consider
5 purchase themselves.
6 We recommend the Board expeditiously approve the
7 investment plan and allow for Volkswagen to move forward
8 with its plans here in California. Since the settlement
9 funds cannot be spent to operate Volkswagen's charging
10 network, the investment plan provides Volkswagen an
11 ongoing incentive to introduce more diverse EVs into the
12 market to ensure the infrastructure is used and their
13 investment is not wasted.
14 Thank you.
15 CHAIR NICHOLS: Thank you.
16 MR. ELRICK: Thank you, Chair.
17 Because of the early investment from the Air
18 Resources Board and the Energy Commission, the commercial
19 market for fuel cell electric vehicles began in 2015.
20 This week station number 26 opened here in Riverside, with
21 numbers 27 through 30 opening in the coming weeks.
22 Retail stations are standardized. Every car can
23 use every station, and every customer can use every
24 point-of-sale system with any credit card.
25 CEC has proposed funding for 16 additional

1 stations. And if all these funded stations open as
2 planned, California will have 65 hydrogen stations
3 statewide. We've learned a few things from these
4 stations.
5 First, hydrogen stations mean business in
6 California. We're seeing hydrogen station developer
7 start-ups as well as companies moving from Europe because
8 they believe in this technology and California.
9 Second, drivers love the cars. They aren't held
10 back by range anxiety and/or cars that are too small for
11 their families. The only thing standing in the way of ZEV
12 development are refueling points.
13 We need more stations. And ARB's own analysis
14 has found that if we continue at this pace, there will be
15 more demand for fuel than supply. And if that's happens,
16 fuel cell vehicles will slow down coming to the market.
17 Customers won't buy a car if they can't fuel them.
18 Volkswagen is a member of the California Fuel
19 Cell Partnership and continues to participate in our
20 meetings. They, like most automakers, will bring a fuel
21 cell vehicle to market with -- and will benefit from a
22 growing network of hydrogen stations. They may also
23 benefit from directly investing in the station development
24 start-ups as other automakers have.
25 California has benefited from ARB's fuel-neutral

1 position and commitment to all forms of alternative
2 transportation. Because of the agency's actions, our
3 State is a world leader in the deployment of fuel cell and
4 battery electric vehicles.
5 And I want to thank the Board and its staff for
6 continuing to show their strong leadership and initiative
7 for its citizens.
8 MS. McGHEE: The ZEVs need infrastructure. I
9 suggest we make a requirement for renewable charging. The
10 technology is advanced charging. It is available. It's
11 off the grid. It further reduces emissions and is
12 actually zero-emission charging. It saves ratepayers
13 kilowatt-hour costs. The 150 and 350 kilowatt charging
14 power is not accepted in any car or medium-duty vehicle
15 today. The 50 kilowatt is broadening and it is accepted
16 and it is the future. Transit buses develop charging to
17 accept these levels due to their gross vehicle weight.
18 Most importantly, over 20 kilowatt triggers
19 kilowatt-hour demand fees, which will greatly increase the
20 cost of charging, which increases the cost of a mile.
21 Imagine this: The cost of a kilowatt-hour is absolutely a
22 benefit when compared to fossil fuels. This will
23 accelerate adoption.
24 Renewable infrastructure supports this. It saves
25 money to a ratepayer and it saves admissions. I would

1 like to invite a consideration. Demonstrations are
2 needed. We still need to know more and learn more about
3 many fleets and other types of charging patterns and
4 behaviors. That would be some of the barriers that we're
5 experiencing with short-range vehicles. This would be
6 specifically well suited for many of the fleets but the
7 inventory is just not available.
8 Thank you.
9 CHAIR NICHOLS: Thank you.
10 Did you have a comment?
11 BOARD MEMBER RIORDAN: I just wanted to say to
12 the staff, I think you have a very thoughtful
13 recommendation before us in the resolution that you've
14 provided, and I'm sure that in time we are going to
15 improve. We may have heard some things today we'd like to
16 include. But I think, you know, this is a great beginning
17 and I want to thank you very specifically for
18 acknowledging the part of this resolution that says that
19 we are encouraging and investing in activities that do not
20 unduly interfere with or undermined established or
21 emerging businesses. And I felt, you know, that was a key
22 issue for me, that people had gone out on their own and,
23 you know, had certain things before this whole thing
24 began.
25 And we need to continue to encourage them and

have a whole network of people. So I wanted to thank you.

I guess you have somebody that --

CHAIR NICHOLS: We still have two more witnesses.

BOARD MEMBER RIORDAN: I didn't realize that. I thought we were finished. I wish we were finished.

CHAIR NICHOLS: That's okay. Your comment is still --

(Laughter.)

CHAIR NICHOLS: -- still applicable.

(Laughter.)

CHAIR NICHOLS: All right. We have Mr. Harvey Eder.

BOARD MEMBER RIORDAN: Oh, I didn't know.

CHAIR NICHOLS: And also Brendan Jones from Electrify America.

MR. EDER: Hello.

There shouldn't be money in this that's paid for fines, penalties. That should be something separate. And this money could be used for seed money to leverage in combination with solar for solar electric and solar hydrogen fuel cells. And it could be especially directed towards the low and disadvantaged income.

There -- thank you.

CHAIR NICHOLS: To your point, I don't think there are any monies being spent that should have been

1 penalty money. I know you're going to be back for the
2 public comment because we've already got a card. So we'll
3 hear from you again.
4 Okay. Mr. Jones. Welcome.
5 MR. JONES: Thank you. Thank you, Board,
6 Chairman Nichols, to the CARB staff and the members of the
7 audience. I'm Brendan Jones. I'm the newly appointed COO
8 for Electrify America. Previously before that I was the
9 director of electric vehicles and infrastructure for
10 Nissan and also the vice president of OEM Development for
11 EVgo.
12 I am an EV enthusiast, an infrastructure
13 specialist. I believed in the space. After a 27-year
14 automotive career, I fell in love eight years ago with
15 what I am doing; and until the day I retire, I hope I
16 never stop. I found what I like, and I love what I do.
17 In regards to Volkswagen and our newly formed
18 company, Electrify America, we'd like to thank the Board
19 and thank the audience for the very valid comments we've
20 heard today. The ones that were very nice, were
21 complimentary; and we listened in particular to the ones
22 that had a little more sharp edges on them and elbows.
23 We're going to take all of those into consideration as we
24 move forward, and we look for the Board's and CARB's
25 advice and guidance as we continue to refine the plan.

The plan in essence seeks to use all aspects of the EV space today: The providers today, the developers today, the charger manufacturers, the installers, the people that are investing their time and lives in this unique opportunity that we have. We are going to continue to advocate, to move forward, to use all the industry players. And we're also going to do it in a very customer-centric way, building stations that are visible, usable, and convenient to the customers that exist today and will buy EVs today, tomorrow, and into the future.

Thank you.

CHAIR NICHOLS: Before you leave, I have a few questions for you --

(Laughter.)

MR. JONES: I almost got there.

CHAIR NICHOLS: -- which I hope you'll treat as friendly, because they're meant to be. They're really meant to give you an opportunity to explain more of your thinking.

MR. JONES: Sure.

CHAIR NICHOLS: Because I've been fortunate enough to read the plan and to read the plan that you -- the additional information that you filed with ARB. And I know there's elements of that that are not public information and that can't be discussed in public.

1 But I want to give you a chance - and I encourage
2 you to do more of this going forward - to tell us a little
3 bit more of your thinking how you got to where you are.
4 So, for example, on this issue of other EV
5 infrastructure efforts that are going on, for example, the
6 investor-owned utilities, what have you done or what are
7 you thinking you will be doing in terms of coordinating to
8 making sure that you're not, you know, putting chargers on
9 opposing corners as opposed to spreading them into places
10 that wouldn't -- in theory that would need them the most.
11 That may not be the best example. But I'm thinking of gas
12 stations where...
13 MR. JONES: Understand. And I'm happy to answer
14 that more particularly because I know the red light's not
15 going to go up in front of me.
16 CHAIR NICHOLS: It's not. No, no --
17 MR. JONES: So I feel good about that.
18 CHAIR NICHOLS: -- you can answer -- you can
19 answer it fully.
20 No, seriously, you're --
21 MR. JONES: So there's an ongoing effort with the
22 company right now to reach out and explore opportunities.
23 We heard the 1 point 1 equals 2 -- 1 plus 1 equals 2.
24 Internally we call it 1 plus 1 equals 3, and how do we
25 achieve that.

1 The effort to reach out to both investor-owned
2 utilities and municipal utilities is underway. So that we
3 don't overlap but yet we complement.
4 We've heard comments from others in the room such
5 as Pacific Gas & Electric, Southern California Edison, and
6 other utilities across the country. That is a key part of
7 our rollout plan, is how do we extend the dollars they're
8 investing with the dollars we're investing simultaneously.
9 CHAIR NICHOLS: So you have no reason to want to
10 invest where they are investing if it's already going to
11 happen.
12 MR. JONES: If it's already going to happen, we
13 need to complement that investment and spread. As we
14 heard, our chief concern is looking at the real data. So
15 this investment is only 400 chargers in the state of
16 California. There's 4,000 chargers already in the state
17 of California, so it is small in comparison.
18 And also if we look at the 10 percent that says
19 this investment over its span will only hit 10 percent of
20 the goal.
21 So we have to work with everybody else and make
22 sure that those efforts are complementary, not in
23 conflict.
24 CHAIR NICHOLS: And how are you approaching this
25 issue of investing in disadvantaged communities? What's

1 your -- at this point what's your thinking about that?
2 MR. JONES: Well, there's a two-pronged approach
3 to it first. So right now we've been identified between
4 25 and 35 percent of the investments in disadvantaged
5 communities. There'll be two specific over the life of
6 the investment identified communities. Sacramento is one
7 that is our suggestion. Another a yet to be identified.
8 I think what we owe back to CARB and to the Board
9 is a better definition of where those chargers are going
10 to go and how they're going to impact the community as a
11 whole.
12 We also need to work with those communities to
13 take our investment and expand it. It takes more than
14 just what Electrify America is going to bring to the
15 table. We've heard some statements from others who are EV
16 infrastructure partners and are out there. We encourage
17 them to also work with us in those communities.
18 It's one thing for us to do it. But if we have
19 all the players doing it, we're going to have a better
20 impact. And we want to work with them, not against them,
21 to create this. And I've done that before in a previous
22 job. I think we can do it here once we get past all the
23 details, et cetera. I see a collaborative effort as the
24 best effort for the State.
25 CHAIR NICHOLS: Do you have a response to the

suggestion that you should be investing in hydrogen infrastructure as well?

MR. JONES: Oh, I'll admit at first I'm not the expert on hydrogen infrastructure. It hasn't been a focus of mine. I'm primarily an electric vehicle infrastructure evangelist.

We are looking at it, as my boss has explained to you, I think, several times. It has not been ruled out. But we don't have any firm definition or commitment or how we're going to do that yet. So it would behoove me not to say anything other than that at this time.

CHAIR NICHOLS: Okay. And I guess maybe a last question. Others may have more too. But I want to ask you -- this is obviously a first of its kind -- the first plan of its kind that I'm aware of that anyone has ever done. And it's -- so it's a little bit of a work in progress.

But how do you anticipate that future plans will be different, either in terms of the process or what they can take?

MR. JONES: Well, first I'm hoping I'm less stressed about the future plans, because this one has been very compact. I think, number one, we can learn from the planning cycle we've gone through today. We'll have more time.

1 We are building a strategy team. And the
2 strategy team's sole purpose is to begin planning for the
3 second cycle as soon as we get into the implement phase of
4 the first cycle. So that strategy team is going to reach
5 out and say first let's analyze everything we didn't like
6 about how it happened with the approval of Cycle 1. Then
7 second, we understand that more transparency -- someone
8 made the comment about opaqueness. We have to eliminate
9 both those perceptions and the reality of it both with the
10 public, with CARB, and with the CARB staff and the Board,
11 et cetera. And that doesn't mean just for California.
12 That's across the United States.
13 Then we really have to do a good job looking at
14 what all of our partners are doing, what type of
15 technology is going into the ground today. The first
16 investment takes care of a lot of EV infrastructure, Green
17 Cities. And then we have to look at what more do we need.
18 Demand charges within this State and demand charges across
19 the United States make driving an electric vehicle if
20 those demand charges were passed on to a consumer way more
21 expensive - double, triple, quadruple the price of
22 gasoline.
23 So we have to look at the investment and analyze
24 where does this opportunity allow us to mitigate demand
25 charges? Is it battery backups at each station? Is it

1 demand mitigation software? Is it working with the
2 utilities on a collaborative effort to lower demand
3 charges for consumers who drive EVs?
4 So that planning, along with doing a gap analysis
5 and looking at other investments, needs to happen early so
6 by the time we get to the Board and to CARB, that plan is
7 almost bulletproof and might need only minor modifications
8 over time.
9 CHAIR NICHOLS: How long have you been with the
10 company
11 MR. JONES: Six months.
12 CHAIR NICHOLS: Six months. Okay.
13 MR. JONES: Six months. And I had a full head of
14 hair.
15 (Laughter.)
16 CHAIR NICHOLS: How many people are there?
17 MR. JONES: So right now there's a staff of 13
18 hired from organizations such as Nissan, Greenlots, BMW
19 North America, EVgo and Nissan, G.E. -- I won't go -- give
20 you all their names. So we're bringing in EV
21 professionals who this is what they like. One thing I've
22 learned, that if you're going to be successful in this
23 space, you better like it. And while you can't make that
24 a hard hiring criteria, it is one that we are strongly
25 evaluating. You better like this space, because you'e not

1 going to get anything accomplished. And you better learn
2 to listen; because if you don't listen, it's going to be
3 much harder.
4 CHAIR NICHOLS: So before I let you go or let you
5 answer any other questions, one more question that I was
6 going to ask you, which I found just -- oh.
7 What would you say to my friends and neighbors in
8 Los Angeles who obviously feel very strongly that they're
9 doing tremendous things with EVs and they, you know, would
10 like to do more and would like to be designated by you as
11 a Green City?
12 I need to go visit the people in Los Angeles. I
13 need to get them in a room. I need to explain in detail
14 what we plan on doing and see where there's opportunities
15 to improve upon that plan. I got that as a very clear
16 message. We took notes on that. So we have to plan a
17 meeting and we have to bring all those groups together;
18 because it's about communication. There's some things
19 frankly we will not be able to do in the plan and we're
20 not going to be able to please everybody. But with --
21 still the onus on us is to communicate what we can do and
22 find ways to extend our reach. And that very much is
23 something we'll do after the great folks of the city of
24 Los Angeles brought out the horses, the bandwagon. Not
25 much ammunition in terms of weapons, but everything else.

1 CHAIR NICHOLS: Oh, yeah. It was very positive,
2 I thought.
3 Okay. Just a couple of Board members have raised
4 their hand. So it was -- Alex Sherriffs was first and
5 then it was Senator Florez.
6 So, Dr. Sherriffs, if you want to go first.
7 BOARD MEMBER SHERRIFFS: Sure. Thank you.
8 This is $300 million; and, you're right, this is
9 very fast. And I think -- and, you know, in a sense the
10 transparency, the opacity of the process, I think about
11 what this Board goes through to think about managing $300
12 million and the length of the process. It's daunting what
13 you've been working with.
14 You know, I guess one thing I'm concerned, we've
15 heard about hydrogen and we have tried to be very fuel
16 neutral and, you know, you say it hasn't been ruled out.
17 I think we would like to hear it's in.
18 And if -- you know, it's great that you have
19 surrounded yourself with people that have passion about EV
20 and about electrification. But hydrogen is not going to
21 be on the radar if there aren't people -- their passion
22 about that as well.
23 So that's -- that's -- that's a concern.
24 This is very minor but kind of -- and then I
25 don't know if this is probably in the settlement and so

it's neither here nor there, and maybe it's a little bit negative. But, you know, rather than saying "sponsored by," I think what it should say is "Funded by VW Settlement Decree," which carries I think an important message. And I'm happy to see that spread everywhere.

The comments have been made about our valley, the Central Valley. And we're only 10 percent of the population. But similar to California getting 40 percent of the settlement, well, in part that's because where the most damage was done was in California when we look at South Coast, Central Valley, the biggest impact of every pollution molecule in terms of how that reverberated. And so, likewise, the Central Valley may be only 10 percent. But I hope in future plans there's a lot more attention to the Valley. And in part, you know, the Valley, they weren't here, L.A. was here. That's great. L.A. had some wonderful ideas. And I hope, I hope Bakersfield, Fresno are here with some wonderful ideas for the second plan.

You know, we want this plan to succeed. We want this plan to succeed. We want this to work. You know, I suppose one concern I have is it may pick off a lot of the low-hanging fruit in terms of what other people have been working on, what other groups have been struggling with. So, again, we want it to succeed. There's -- we want it to work.

1 But the complementarity is so important, so
2 critical, to be partnering with the organizations that
3 have been committed and doing so much in the past.
4 So again, you know, one of my major concerns is
5 to be sure that the Central Valley is very much on the
6 radar in subsequent plans.
7 There was an earlier comment, "Yeah, we need to
8 move forward, we need success." So, maybe not doing very
9 much with this first proposal. But, boy, we sure need to
10 look at these issues for the subsequent spending plans.
11 CHAIR NICHOLS: Okay. Senator Florez, followed
12 by Ms. Mitchell.
13 BOARD MEMBER FLOREZ: Mr. Jones, thank you for
14 joining us.
15 So you've been doing this for about six months;
16 correct?
17 MR. JONES: For Electrify America, that's
18 correct.
19 BOARD MEMBER FLOREZ: Yeah. So I guess my
20 question is, were you at our ARB meeting when we went over
21 our criteria in December?
22 MR. JONES: The original criteria meeting, no, I
23 was not in attendance for that meeting.
24 BOARD MEMBER FLOREZ: And were you able to attend
25 the legislative hearing that Ms. Peter went through the

1 other day at the Capitol?
2 MR. JONES: No. I received all the notes on the
3 legislative hearing though and read over them.
4 BOARD MEMBER FLOREZ: Okay. Well, thank you for
5 joining us today.
6 The reason I asked the question is, obviously you
7 heard a lot today about the 35 percent for disadvantaged
8 communities. In your comments you mentioned 35 percent
9 and 25 percent. And I could see you have a little
10 confusion. In our original PowerPoint presentation in
11 December there was a 25 percent number there. It has been
12 the Board's policy I believe to try to be at 35 percent
13 for disadvantaged communities.
14 So I'm wondering, where does that criteria
15 specifically fall within the way you made your decisions
16 on this plan?
17 MR. JONES: So the criteria for --
18 BOARD MEMBER FLOREZ: 35 percent.
19 MR. JONES: -- the 35 percent came first as a --
20 from the guidance document. And when we saw the guidance
21 document, it was the first time we have seen that. We
22 have been working backwards since that date to ensure that
23 where the infrastructure's going to go there's a degree of
24 compliance if not outright compliance with that. We're in
25 the process right now of continuing to refine that. And

1 we have new documentation that further defines, but it's
2 not available to the Board yet.
3 BOARD MEMBER FLOREZ: Got it.
4 MR. JONES: So I think on that topic, we have to
5 have a continuation of a dialogue.
6 BOARD MEMBER FLOREZ: Okay.
7 MR. JONES: I can't commit today of where we'll
8 be on a percentage, because, frankly, it's in flux and
9 it's in motion right now.
10 BOARD MEMBER FLOREZ: Well, that's my -- let me
11 just follow your train of thought then.
12 So you mentioned three words when you gave your
13 opening comment. You said, "Advice, guidance, and
14 refinement," and you just said the same thing again now.
15 So is it safe to say that the document that we have before
16 us today is not complete?
17 MR. JONES: No, it's -- the document is complete
18 in terms of where the investments are going to go. In
19 terms of what those investments --
20 BOARD MEMBER FLOREZ: So how does the 35 percent
21 fit in that then?
22 MR. JONES: Because the analysis wasn't 100
23 percent complete and did all of those chargers fit in if
24 you use the CalEnviroScreen, how much impact, where was
25 the -- when -- there's a geospatial analysis --

1 BOARD MEMBER FLOREZ: No, I get it.
2 MR. JONES: -- that goes in --
3 BOARD MEMBER FLOREZ: I get it.
4 MR. JONES: -- as well. We've just completed our
5 first round on the geospatial analysis, and that even
6 refines it further to say whether it was in. If this
7 particular charging station is in or without, and that
8 refinement is happening right now.
9 BOARD MEMBER FLOREZ: Okay. So when the
10 refinement occurs, will it be for this plan before us --
11 because we say yes or no to it. We don't like write out
12 what we'd like you to do. We simply say yes or no.
13 So I guess my questions is, so if I was looking
14 at 35 percent -- let's just use one of your metrics in
15 your plan. So 75 million for the highway. 25 percent is
16 what you utilized. But if you look at 25 percent of 75
17 million, which is of 200 million, it's about 9 percent
18 that actually go to the lowest quartile of disadvantaged
19 communities. 9 percent. Our standard here has always
20 been 35 percent. So we are severely behind in that
21 metric. And if I were to double it to go to 50th
22 quartile, we'd be at 18 percent.
23 If I were to take the highest number, 75 percent,
24 obviously we'd be at 36 percent.
25 I mean, I guess the point is we -- the way that

1 you have given us your rendition of our guidance leads me
2 to the conclusion that we are not close to the 35 percent
3 at all, which would leave me against the plan, quite
4 frankly; because I think the goal of it is to try to
5 maximize the 35 percent.
6 So let me just go a step further on timing from
7 your perspective. So let's say that Dr. Sherriffs is
8 correct -- and I think you would agree, we just kind of
9 rushed through this, right? I mean, we've had -- we put
10 our plan out. You replied in 10 days or so. And then we
11 are now seeing your plan for 10 days. And then staff told
12 us in their presentation somewhere about the end of April
13 we're supposed to say yes or no. That gives another 20
14 days.
15 So the way I look at it, it's a very fast process
16 for a lot of money, as Dr. Sherriffs said. Normally the
17 Board on that amount of money we'd take a little more time
18 to really kind of think about the metrics. But what's
19 interesting about it is in the next tier, the second
20 decree, are things I really like. So we have our EJ --
21 assistant EJ director involved. We have a target. We're
22 specifically pointing to a disadvantaged community in
23 totality, not as some sort of subsidiary off-highway
24 thing. We are pointing specifically to the
25 CalEnviroScreen. So there's some really like cool stuff

as we start to work out this second decree that I guess we may have learned moving through the first.

So I guess my question is, are we slowing you down or are we slowing ourselves down to just put both together with the same criteria?

MR. JONES: Wow. There was a lot of great content in what you said, and I don't know that I can provide you at this point in time with an adequate response. I mean, I'm not trying to brush off at all.

I think from our perspective, we have to look at the consent decree and the mandates of the consent decree, look at the guidance which we are taking seriously in looking at the guidance, and look at the plan. And that actively is taking place right now, and we're committed to that.

I can't commit to you there's going to be a hundred percent matchup to what the guidance was and what the consent decree mandates. I can commit to you that we're going to take measures to make sure that where possible the chargers will be in those areas. And there's going be no effort on behalf of Electrify America to modernize or not place them there if it meets the plan.

So there's business considerations afoot and also there is social and policy questions afoot, and we're taking all those into consideration.

1 BOARD MEMBER FLOREZ: Okay.
2 MR. JONES: And I'm not trying to be evasive.
3 BOARD MEMBER FLOREZ: No, no.
4 MR. JONES: It's a difficult question.
5 BOARD MEMBER FLOREZ: That's fine.
6 Just a last question just in terms of the timing
7 as you see it. This is a very fast process. We -- the
8 staff took us to the timeline. If you do the days, it's
9 like every note is 6 or 7 or 10 days, and maybe there's a
10 30-day public participation.
11 The reason you saw Genevieve here from the
12 Central Valley as being one of the only EJ folks here is
13 because, when you talk to EJ folks and you tell them about
14 the settlement, they go, "What's going on?" And that
15 tells me there's not enough input, there's not enough
16 discussion, there's not enough dialogue, there's not
17 enough meetings. That means the EJ community should be
18 front and center. I can definitely tell you this room
19 would be filled with outrage if they knew somehow they
20 were part of a, you know, the one I-5 stop off of Harris
21 Ranch, and you had to drive there from Avenal for 30
22 minutes or you had to drive there from Hanford for 30
23 minutes, or you had to drive from Buttonwillow down to the
24 Bakersfield -- I mean.
25 So those are questions that EJ groups I know will

1 have very serious -- want to have some serious discussions
2 on.
3 But I guess to the point of the timeline, the
4 last question I was going to ask you is -- you mentioned
5 the word "complement." And we have heard a lot in our
6 discussions here in the Board, even at the first
7 presentation about, you know, giving you some sort of
8 competitive advantage in terms of the other companies that
9 are operating in this space. And I was very happy to hear
10 you say complement, because I think that's exactly what
11 the Board would like to do. But I think sometimes when we
12 complement, we kind of pile on in areas where there's a
13 lot of competition and where some of those areas are
14 rather well served, even though they need to grow.
15 Sacramento needs to grow. San Francisco needs to grow,
16 L.A. needs to grow. San Diego needs to grow. They're all
17 big urban centers where all of you folks are going to rush
18 in and hopefully do great jobs of getting the EVs
19 connected.
20 But when I think of the VW issue, I think about
21 sending you to places what you normally wouldn't go, you
22 know, places where you might want to think about
23 interconnective -- interconnecting some communities that
24 might be ignored.
25 So that's just kind of my thought process. So as

1 you start to think about that in the second tier or the
2 second consent decree, I think that's probably what I'd be
3 interested in hearing some of VW's thoughts.
4 The last point is, on the complement side, are
5 you coordinating with PUC in the short process? I mean,
6 it seems like we a had a lot of directive to you in our
7 own directive we put out to -- that you coordinated with
8 PUC, CEC. A lot of folks are putting infrastructure in.
9 How has that conversation gone thus far in these
10 30 days that you've seen the plan?
11 MR. JONES: So there is coordination on the
12 utility level, the depth and nature of it. I have another
13 senior director who handles that specifically. I get the
14 higher level feedback. And if I could recite all the
15 emails and the depth of those emails, I -- I wish I could.
16 And 10 years ago I might have been able to do better than
17 I can do today as well.
18 But I can tell you that I'm confident where it is
19 today, but I'm also cautious of the fact that it needs to
20 get much better.
21 BOARD MEMBER FLOREZ: Got it.
22 MR. JONES: There is newer meetings on the
23 calendar that are coming with the CPUC. I just read one
24 today; and myself and my colleague sitting back were
25 commenting on it.

1 So those efforts are ongoing, and they're also in
2 California and across the United States simultaneously.
3 BOARD MEMBER FLOREZ: Since I have you here, the
4 last -- the last question, I promise.
5 Is there a problem with combining the approach
6 that we're taking in the second decree as opposed to what
7 we're doing with the first? In other words, does it slow
8 you down if you feel that somehow you kind of got it right
9 a little more so on the second decree in terms of
10 disadvantaged communities, of involvement of our assistant
11 EJ director, involvement of CalEnviroScreen, of targeting
12 of both large and small communities where you have urban
13 centers and urban -- metropolitan centers combined with
14 communities, as you put, at least we have, you know,
15 500,000 and below as one of the criteria for you. I'm
16 just -- does that -- I guess the question is, what's the
17 drop deadline for VW for this plan? When does it not work
18 for you?
19 MR. JONES: For Cycle 1?
20 BOARD MEMBER FLOREZ: No, Cycle 1 and 2.
21 MR. JONES: Well, Cycle 1 I believe based on
22 where we're at, the consent decree was signed on October
23 26th, I believe. The clock started on January 1st. We're
24 already behind before we began.
25 BOARD MEMBER FLOREZ: And when you say we're

1 behind, why are we behind?
2 MR. JONES: There's a level of synchronicity
3 between the EPA plan and between the CARB plan.
4 BOARD MEMBER FLOREZ: Uh-huh.
5 MR. JONES: We have confidence that the CARB plan
6 is moving forward on time. We have concerns because we're
7 all still having a lot of debate that we're going to be a
8 little bit more delayed.
9 As the comment relates to the second cycle, I
10 think the second cycle gives us an opportunity to be more
11 clear and more up front in the early stages of planning on
12 what the differences are; and the differences are in
13 expectations. I can't sit here and commit to everything
14 that you're outlining. We have to look at what the
15 marketplace first yields from the first investment plan
16 when it is approved and then begins the implementation
17 phase. And we'll look at where the unmet expectations
18 were and can under the consent decree and the way its
19 established, written and the way we have to adhere to it,
20 do we have the ability to do everything that everyone
21 wants, the entire constituency group, under Cycle 2.
22 We're clearly not going to do everything. But there are
23 three more cycles to go.
24 BOARD MEMBER FLOREZ: Correct. And I just hope
25 you look at the 35 percent. That's really critical.

1 Thank you.
2 VICE CHAIR BERG: Senator Florez, I thought it
3 would be helpful too. Staff has a couple of comments on
4 the timing as well.
5 And so Ellen Peter.
6 CHIEF COUNSEL PETER: Thank you, Vice Chair Berg.
7 So, Senator Florez, just to give a little bit of
8 the timelines. You're talking about the second
9 agreement -- the first agreement and the second agreement.
10 So the one that was first signed by the -- that
11 we negotiated and was already approved by the Court, which
12 was the 2 liter deal. So all of the 800 million is in
13 that agreement. And that was negotiated in the spring of
14 2016 and signed and filed with the Court at the end of
15 June.
16 So at that point we had built in the
17 disadvantaged community as a concept as one of the
18 agreements. At that point, the figure that we used for
19 the CalEnviroScreen was the -- connected with the
20 Greenhouse Gas Reduction Fund. So that was SB 535. So in
21 the spring of 2016 that was set at 25 percent.
22 And so that was the second 2 liter deal that was
23 filed.
24 Then when you referring to the second decree when
25 we started negotiating it in the summer and fall of 2016,

1 at that point the legislature did two things that were
2 significant in terms of my looking at this, is they had
3 put in a lot of money into the budget for the EFMP Plus
4 Up, specifically for low income people getting ZEVs. And
5 so we -- we're in the negotiations for the next deal. And
6 so the 25 million was basically reflecting that signal
7 from the legislature for that program.
8 No more money was added into the investment.
9 That was still at 800 million from the beginning.
10 The other thing, what happened that summer was AB
11 1555 came in, which for the Greenhouse Gas Reduction Fund
12 went up to 35 percent. So we reflected that percentage in
13 the ARB guidance; but just in terms of the order, they
14 were happening at different times.
15 And also in that 3 liter agreement, that's when
16 we added the second Green City, with the emphasize that it
17 would be a disadvantaged city. So I think -- you're
18 right. Those concepts change between the 2 liter
19 agreement and the 3 liter agreement, and partially it was
20 reflecting what was happening in the legislature.
21 BOARD MEMBER FLOREZ: Right. And if the Board
22 liked the second part better than the first, could we not
23 just not approve this plan and have that plan 1 and 2
24 re-reflective of what you just said?
25 CHIEF COUNSEL PETER: So they're under an

1 obligation, which was, you know, set in October of 2016,
2 to start moving. And they submitted the plan and they're
3 following all of the deadlines. In terms of that's a
4 30-month cycle.
5 And so we can look at it. And what the plan is
6 in light of the concept decree and our guidance, if they
7 chose to, you know, add more in, they could do that. But
8 there's a tension I think in terms of timing and get the
9 money out the door.
10 Also the 30-month cyc -- the 30-month plan has
11 six-month check-ins and annual reports. So I think Mr.
12 Jones indicated that he was -- they were continuing to
13 look at it. So perhaps there's a process that's already
14 built in the consent decree for touch basis back where you
15 can -- we can -- the issues that you raise, which are from
16 the 3 liter decree, those concepts could be put in. But
17 the investment comes out of the 2 liter deal --
18 BOARD MEMBER FLOREZ: Thank you.
19 CHIEF COUNSEL PETER: -- if that's helpful.
20 MR. JONES: And, Senator, my colleague handed me
21 a document that is outlining some of new work and
22 analysis, and we'll make sure the Board gets it.
23 But the round-up is -- over 35 percent of the
24 investment will fall in areas in the bottom 2 quartile.
25 Now, we owe you more definition on that and we'll

1 work to get it. I want to make it more than just a
2 statement on a piece of paper, and rather something that's
3 meaningful for the staff and for the Board.
4 BOARD MEMBER FLOREZ: Uh-huh. 35 percent in the
5 bottom 2 quartile?
6 MR. JONES: That is correct.
7 BOARD MEMBER FLOREZ On the first --
8 MR. JONES: First investment.
9 BOARD MEMBER FLOREZ: On the first investment?
10 MR. JONES: Yeah, based on the initial analysis, yeah.
11 BOARD MEMBER FLOREZ: But 75 million of 200
12 million total is 35 percent. So you're saying all the 75
13 million is going to the bottom 2 percent quartile?
14 MR. JONES: No, it's specifically on the type of
15 investment instead of the total investment. So an
16 infrastructure investment, so it --
17 BOARD MEMBER FLOREZ: Now you'd do it, it's going
18 to have to add up to 75 million, just so you know.
19 There's no other way around it. It's 35 percent. Okay.
20 MR. JONES: We'll definitely have to allow a line
21 on math, on, you know, what -- is it out of the pure total
22 or the percent that is infrastructure only versus
23 awareness versus Green City? Yes, agreed.
24 CHAIR NICHOLS: Okay. So can we hear from Ms.
25 Mitchell now please.

1 BOARD MEMBER MITCHELL: I'll try make this
2 shorter than Senator Florez.
3 But first thing was, and some of my colleagues I
4 think agree on this, that no hydrogen fueling is in the
5 plan. And I'd certainly like to see some of that. The
6 hydrogen cars are just now coming out, and we need to give
7 a boost to that market. So I think that would be
8 important for you to consider including that. I mean, it
9 is an electric motor and run by hydrogen.
10 So That would be an important component.
11 The other thing I want to mention is that I
12 represent the South Coast Air District, and that's a
13 nonattainment air district. And it would be my conclusion
14 that the VW diesel cars probably contributed a lot to the
15 NOx problem that we suffer in the South Coast District.
16 And to that degree, I think you could consider that some
17 of the funds that you have in this pot should be going to
18 mitigate that damage.
19 And I'll give a shout out to L.A. as the next
20 Green City you choose. And that would be one of the
21 reasons that I think it would be a good choice. But it
22 certainly also has a lot of disadvantaged communities
23 where you could find ways to spend that money.
24 But, anyway, NOx is a big problem for us. And VW
25 actually exacerbated that. So we would hope you would pay

1 attention to that district.
2 Thank you.
3 CHAIR NICHOLS: Okay. Supervisor Serna.
4 BOARD MEMBER SERNA: Thank you, Chair.
5 So I certainly appreciate the fact that you've
6 been up here now for probably 30 minutes asking some
7 important -- addressing some important questions,
8 especially those that come from my colleague, Senator
9 Florez.
10 But I do feel like it's important at this point
11 to note the fact that the designation as the -- of the
12 first Green City deployment and, you know, obviously, as
13 the Sacramento Valley member of this Board, I'm delighted
14 to see that VW is proposing Sacramento for its first
15 deployment. But I think it's important to realize that
16 it's not just one aspect of a particular candidate Green
17 City that you're looking at.
18 I think it's pretty clear, especially in the
19 guidance document, that there are several different
20 contributing factors that will, you know, go into the mix
21 of making that determination. And as was stated by
22 Assistant City Manager John Dangberg, who was here on
23 behalf of Mayor Darrell Steinberg, the fact that
24 Sacramento is diverse -- extremely diverse - in fact, for
25 the last 20 years it's been noted in national media as

1 being one of the top 10 diverse municipalities anywhere in
2 the country.
3 Certainly we have some very, very disadvantaged
4 communities ourselves in not just the city but the county
5 of Sacramento. In fact, the district I represent has some
6 of the poorest census tracts anywhere in Northern
7 California.
8 So, I do appreciate that.
9 And let's not forget too that one of the most
10 important aspects of making a determination of the first
11 deployment is also the likelihood for success. And when
12 you look at what Sacramento has achieved, and has actually
13 achieved years ago - not just recently but years ago,
14 especially as it relates to our Take Charge initiative to
15 be EV ready, that was actually adopted by our Council of
16 Governments -- in fact, I was on the Board in 2013 when
17 that was adopted. And certainly as a county supervisor
18 enjoyed the deployment of that particular directive as it
19 reflects how we've actually incorporated EV readiness into
20 our county building codes and parking codes. So I think
21 complement of all these considerations, all these aspects
22 of what Sacramento has done to really prepare to be
23 successful, I think I have to believe that that is what
24 has really led Electrify America and the Green Cities
25 deployment determination to the conclusion it has in terms

of the proposal that Sacramento be that first Green City deployment candidate.

So again, while I appreciate the fact that -- certainly appreciate the fact that disadvantaged communities has to be, must be a consideration here and how EV deployment and infrastructure to accommodate deployment of EVs is an important factor, it's not the only one.

CHAIR NICHOLS: Thank you.

Okay. Mr. De La Torre, you are next.

BOARD MEMBER DE LA TORRE: You've heard from two of my colleagues about hydrogen infrastructure, and you talk about electric vehicles, we talk about ZEV. We want zero-emission vehicles. So whether it's battery electric or hydrogen fuel cell, we want them both. We want to see this play out. We don't know, you don't know. Maybe you're betting on VHS, maybe you're betting on Beta. We don't know. And so we want to play this out in both marketplaces. My gut tells me they will both be out there and they will be successful. Diesel and gasoline maybe.

So it is very important that we see a benefit from this. And we're not Blanche DuBois here. We're not relying on the kindness of strangers. We are here as a party to a settlement for something that was done that was terrible.

1 And so we need to have a commitment from you,
2 Electrify America, VW, whatever entity it is, that is
3 going to deliver what we're expecting -- what the people
4 of California are expecting, which is zero-emission
5 vehicles.
6 So that I think cannot be overstated. Because
7 it's been said by a couple of us, but I want to make it
8 really clear. Does that mean we're going to run to court?
9 Maybe. Does it mean we're going to run to the people of
10 California? Oh, yeah. We can do that.
11 So you will understand that in light of why we're
12 here, the only Ronald Reagan quote that I ever use, is
13 trust but verify. And so I will expect to see in the
14 fairly near future something that incorporates some
15 hydrogen infrastructure into this plan. That's a lot of
16 money, and the bulk of it can be BEV, but we need to see
17 something a little different as well.
18 Thank you.
19 CHAIR NICHOLS: I think "Trust but verify," it
20 was one of Ronald Reagan's made-up Russian proverbs he
21 liked to use, as I recall.
22 But, you know, I think you've heard from some of
23 our Board members. Not everybody has spoken, but I think
24 you can tell that there's a huge amount of interest in
25 this program going forward.

1 I just want to say that I appreciate your
2 commitment to the partnership concept. I believe based on
3 what I've read that you want this investment to be a
4 success. I don't usually -- I'm not usually modest about
5 ARB's ability to do absolutely anything, but I don't know
6 that we are the experts on how best to invest ZEV money,
7 to be quite clear here.
8 I think your need as a company to succeed in this
9 area is at least the equal of our need for you to be
10 successful from a policy perspective. And so I really
11 want to be open to hearing from you, you know, why you
12 make the decisions that you make. I think that is -- if
13 there's one thing that really emerges is there's a need
14 for that ability for all of the interested stakeholders to
15 be able to buy into the thinking that you have.
16 And so maybe we could just leave it at that for
17 the moment. And since it is now 6 o'clock and really is
18 evening, I'll ask if people are ready to move the
19 resolution that we have in front of us.
20 BOARD MEMBER SERNA: I'd like to move the
21 resolution.
22 BOARD MEMBER RIORDAN: I'll second the motion.
23 CHAIR NICHOLS: Okay. Without any further
24 discussion, all in favor please say aye.
25 (Unanimous Aye vote.)

1 (Board Member Eisenhut not present.)
2 CHAIR NICHOLS: Opposed?
3 None.
4 And no abstentions on this one.
5 So you have a resolution from us, which basically
6 is saying staff, you go, you know, work on the details
7 here within the parameters that I think we've laid out
8 pretty clearly. Keep us posted. And be well and prosper.
9 MR. JONES: Thank you, Chairman. Thank you,
10 Board. Thank you, CARB staff.
11 CHAIR NICHOLS: Thank you.
12 VICE CHAIR BERG: Mary, we do have --
13 CHAIR NICHOLS: We have one public commenter.
14 We're required by the Bagley-Keene Act to hear from any
15 member of the public who wishes to address us on a topic
16 that was not on the agenda.
17 And we have one speaker who has signed up. He's
18 spoken on every other occasion, on every other item, and
19 in public comment.
20 I don't see him at this moment.
21 Okay. He's coming. He's making his way down.
22 VICE CHAIR BERG: Could we please just sit down
23 for one moment. That'd be really great. We have two
24 minutes.
25 CHAIR NICHOLS: You are the last speaker of the

day.

MR. EDER: Okay. I want you -- when I was cut off when you were talking to each other, that there was $153 million in civil penalties that was included in that 800 million. They don't need that money. It should go for low income solar electric where they can get some equity in co-ops or to actually finance public transportation systems, which is used by other cities -- companies that need tax shelter. And been working on models of that.

Anyway, everybody's going, so you can -- But I don't think that 153 million -- I think that's in there. It was in the sheet you were hanging up there. It was the second "whereas" on page 4. The first above it was 41 million and then it said 153 million to pay civil penalties.

And they can pay their own damn civil penalties and do whatever time that they've got coming like anybody else.

CHAIR NICHOLS: Right.

MR. EDER: Thank you.

CHAIR NICHOLS: Okay. Thank you.

I think we are adjourned.

(Thereupon the Air Resources Board adjourned at 6:02 p.m.)

C E R T I F I C A T E O F R E P O R T E R

I, JAMES F. PETERS, a Certified Shorthand Reporter of the State of California, do hereby certify:

That I am a disinterested person herein; that the foregoing California Air Resources Board meeting was reported in shorthand by me, James F. Peters, a Certified Shorthand Reporter of the State of California, and was thereafter transcribed, under my direction, by computer-assisted transcription;

I further certify that I am not of counsel or attorney for any of the parties to said meeting nor in any way interested in the outcome of said meeting.

IN WITNESS WHEREOF, I have hereunto set my hand this 10th day of April, 2017.

JAMES F. PETERS, CSR
Certified Shorthand Reporter
License No. 10063

California Environmental Protection Agency
Air Resources Board

NEWS RELEASE

Release #:17-19
Date:03/24/2017

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CARB finds vehicle standards are achievable and cost-effective

CARB votes to move forward with greenhouse gas reductions and zero emission programs through 2025; action sets the table for accelerating programs post-2025

RIVERSIDE - Today California re-affirmed its commitment to clean air, protecting public health and continuing the fight against climate change when the California Air Resources Board voted unanimously to continue with the vehicle greenhouse gas emission standards and zero-emission vehicle program for cars and light trucks sold in California through 2025.

The action ensures that California and 12 other states that follow its vehicle regulations, together accounting for a third of the U.S. auto market, will move forward greenhouse gas emission standards adopted in the 2012 process involving the federal government, California and the automakers.

The Board also voted to support the expansion of the zero-emission vehicle marketplace before 2025, calling for redoubling current efforts underway to support market growth and paving the way for new regulations to rapidly increase the number of zero-emission vehicles required to be sold in California after 2025.

"Today ARB affirmed the technical reviews done by our own and EPA staff, as well as the work of independent analysts," said CARB Chair Mary D. Nichols. "We invite the global industry to bring us their best cars and trucks and take advantage of the willingness of our leaders to provide a broad range of incentives to help make these vehicles affordable. And

we also invite them to come sit down with us if they have specific concerns about implementation of the existing regulations that can be addressed without weakening the impact overall. The program is delivering cleaner cars that save consumers money and are fun to drive: That's how we do it in California."

The Board vote was supported by representatives from the 12 states that have adopted California's standards. Those states together have a population of 113 million and constitute roughly 30 percent of the nation's new car sales. Senior environmental officials from Connecticut, Massachusetts, New York and Oregon testified at today's hearing to urge the Board's approval.

The Board action affirmed the comprehensive, multi-year staff assessment and analysis that concluded that the standards for model years 2022-25 are appropriate and feasible. The staff assessment found that the technology to achieve them 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.

The Board's vote reached the same conclusion as the U.S. Environmental Protection Agency in its final determination in January on the federal greenhouse gas emission standards for model years 2022-25. Last week, however, the Trump administration rescinded that decision at the request of automakers, and announced that it intends to reconsider the final determination in coordination with the National Highway Traffic Safety Agency, which is responsible for setting the Corporate Average Fuel Economy standards.

Governor Edmund G. Brown Jr., Attorney General Xavier Becerra, Senate President pro Tempore Kevin de Leon and Assembly Speaker Anthony Rendon **criticized the move** by the Trump administration.

The Board's decision to stay the course on standards to cut greenhouse gases and smog-forming emissions was based upon the findings of a comprehensive, 637-page staff report that included an analysis of the Technical Assessment Report developed by California and the federal agencies, which was released last July. The CARB staff report also includes the first comprehensive, in-depth analysis of the zero-emission vehicle market in California, including valuable new consumer research to assess the benefits and use profiles of ZEVs now operating in California.

Based on these findings, the Board also voted to pursue policies to support more than 4 million zero-emission vehicles in California by 2030, and established a goal to continue reducing average fleet-wide greenhouse gas emissions from new vehicles by 4-5 percent per year between 2025 and 2030.

"With the midterm review now in the rearview mirror, we look forward to accelerating our efforts to develop the next set of California vehicle standards," said CARB Deputy Executive Officer Alberto Ayala. "California is also moving forward to accelerate deployment of fuel cell and battery electric cars. That will put us on track to meeting our clean air and climate goals for 2030 and also align California with current advanced vehicle technology research and investment in the global auto marketplace."

California, with nearly half of all zero-emission vehicles in the nation, has several programs

in place to further support the growing electric car marketplace. The state offers rebates to new buyers or lessees of zero-emission vehicles, is rapidly scaling the infrastructure for charging electric cards and fueling hydrogen fuel cell vehicles, and agencies are pursuing nearly 200 actions to support the market, as identified in the Governor's 2016 ZEV Action Plan.

The Board expressed its commitment to support the ZEV marketplace by continuing complementary programs such as the Low Carbon Fuel Standard, and redoubling efforts on continued state incentives, utility infrastructure programs, and expanded public education programs, such as the newly established initiative through Veloz, formerly the California Plug-in Electric Vehicle Collaborative.

The staff Midterm Review report is here: **https://www.arb.ca.gov/msprog/acc/acc-mtr.htm**

Statement of Support from Connecticut:

"Connecticut and the other states who have adopted California's greenhouse gas standards have done so because motor vehicles are a major contributor to our GHG emissions and reductions from the California standards are key to meeting our climate goals. We applaud the effort that went into ARB's comprehensive review and we will continue to implement these standards while also strongly supporting ZEV market development through innovative rebate programs like the Connecticut Hydrogen and Electric Automobile Purchase Rebate program. It must also be noted that analyses by both EPA and ARB demonstrate these standards are achievable at lower costs than originally projected so the federal government should keep its promise to the states, the auto makers and, most importantly, the American people who will benefit from the electrification of our transportation systems by breathing cleaner air and paying less at the pump."
Commissioner Rob Klee, Connecticut Department of Energy and Environmental Protection

Statement of Support from Massachusetts:

"Since 1990 the Commonwealth has implemented the California vehicle emission standards for automobiles as a critical means for Massachusetts to meet greenhouse gas and emissions reduction goals under the Global Warming Solutions Act, and the standards have provided tremendous public health benefits in the Northeast region over the years. Through the zero emission vehicle standards approved by the California Air Resources Board, the Massachusetts Global Warming Solutions Act and similar requirements in neighboring states, our region continues to ensure the protection of environmental resources and emissions reductions in a coordinated effort to further reduce greenhouse gas emissions."
Martin Suuberg, Commissioner of the Massachusetts Department of Environmental Protection

ARB's mission is to promote and protect public health, welfare, and ecological resources through effective reduction of air pollutants while recognizing and considering effects on the economy. The ARB oversees all air pollution control efforts in California to attain and maintain health based air quality standards.

Office of Communications 1001 I Street, Sacramento CA 95814. Ph: (916) 322-2990

ARB Homepage | *News Releases*

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Message

From: David Schwietert [DSchwietert@autoalliance.org]
Sent: 4/27/2017 9:51:05 PM
To: Dravis, Samantha [dravis.samantha@epa.gov]
Subject: FW: re: Auto Alliance follow up - Administrator Pruitt Meeting
Attachments: Auto Alliance Letter Administrator Pruitt April 27 2017.pdf; Joint Alliance - Global Petition for Rulemaking June 2016.pdf

My initial email had an error in your address

Dave

From: David Schwietert
Sent: Thursday, April 27, 2017 5:49 PM
To: bollen.brittany@epa.gov; 'dravis.samantha@epw.gov' <dravis.samantha@epw.gov>
Cc: Jennifer Thomas <JThomas@autoalliance.org>; Chris Nevers <CNevers@autoalliance.org>
Subject: re: Auto Alliance follow up - Administrator Pruitt Meeting

Brittany and Samantha,

We wanted to pass along an electronic copy of the charts and letter that were raised during today's meeting with Administrator Pruitt.

Please let us know if you have any questions – both regarding the Harmonization Petition that was filed jointly with EPA and DOT last June as well as the Mid Term Review for MY 2022-2025 fuel efficiency standards for light-duty vehicles.

Note, when the Harmonization petition was filed last June, we requested a direct fine rule to resolve various issues in hopes of addressing those items ahead of the Draft Technical Assessment Report (TAR) that kicked off the Mid Term Review.
Soon after our petition was filed, EPA/DOT and CARB released their Draft TAR which now means that the issues outlined in the Harmonization petition would more effectively be addressed via a rulemaking process – or handled administratively via interpretations. Additionally, since late 2015 the Alliance has been seeking various Harmonization changes via legislation because certain changes require statutory modification.

It's also important to keep in mind that the Harmonization issues relate to near term compliance (prior to MY 2022) due to increasing disparity between CAFE and EPA credit and compliance requirements. Effectively, the concept of One National Program hasn't been realized and it can create instances in which an auto manufacturer can be in compliance with more stringent EPA requirements and still be forced to pay CAFE penalties. We have a host of other examples that we'd be happy to walk you through to underscore the changes that need to be made in keeping with the original 2010 and 2012 agreements that were advertised as "One National Program" for compliance purposes.

Thanks,

Dave

David Schwietert
Executive Vice President, Federal Government Relations & Public Policy
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MITCH BAINWOL *President & CEO*

April 27, 2017

The Honorable E. Scott Pruitt
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Dear Administrator Pruitt:

On behalf of the Alliance of Automobile Manufacturers, Inc. ("Alliance"), I would like to thank you for helping to initiate two recent efforts that impact our industry:

1) EPA's reconsideration of the Final Determination on greenhouse gas standards for light-duty vehicles that was rushed through by the last Administration and;

2) Seeking public input on finding opportunities to streamline the complex array of existing regulations that could be repealed, replaced or modified to make them less burdensome.

The Alliance pledges to work with you on the two above actions and the attached harmonization petition as part of our industry's commitment to improve fuel economy and reduce emissions in a responsible and sustainable manner.

As mentioned in our letter to you dated February 21, 2017, the EPA's premature Final Determination improperly accelerated the single most important decision made by the EPA in recent history. By reconsidering the Final Determination, the EPA has exercised its authority to return to the promised Midterm Evaluation ("MTE") process. The MTE is a key component of the One National Program ("ONP") for fuel economy and greenhouse gas ("GHG") regulations in order to determine the appropriateness of Model Year ("MY") 2022-2025 standards. As your Notice of Intent explained, EPA is required under its own regulations to cooperate and interact with the National Highway Traffic Safety Administration ("NHTSA") during the MTE. Reconsideration of the Final Determination allows EPA to closely engage with NHTSA and to return to a well-reasoned process concerning MY 2022-2025 standards that fully accounts for market conditions, technology advancements, "real world" constraints, economic and employment impacts, previously dismissed or misunderstood stakeholder input, and recent compliance trends.

The Alliance appreciates EPA's commitment to revisit the existing record and consider new and more current data to ensure that "technological and economic concerns raised by the regulated community" are adequately considered and will be addressed moving forward. We look forward to working with you and your team on an informed revised Final Determination for the MY 2022-2025 standards that ensures auto manufacturers can meet the targets in a sustainable manner that does not sacrifice consumer choice, affordability, safety, employment, or fleet turnover. (Fleet turnover is a key indicator of a successful program because it demonstrates that consumers are finding that new and more technologically advanced vehicles are affordable which ensures the safest, cleanest, and most efficient new vehicles are on the road.)

The Alliance plans on working with NHTSA and EPA on the 2022-2025 MY Corporate Average Fuel Economy ("CAFE") and GHG standards and in addressing outstanding harmonization issues between the existing programs (attached). It is important to note that the Energy Policy and Conservation Act (EPCA) uniquely requires NHTSA to consider several key factors as part of its separate rulemaking. These factors include technological feasibility, economic practicability, and the effect of CAFE standards on motor vehicle safety.[1] As such, NHTSA is best suited to take a leadership role in both resolving harmonization issues and in determining final 2022-2025 standards.

The Alliance also looks forward to participating in EPA's implementation of Executive Order 13777: Enforcing the Regulatory Reform Agenda. We plan to both submit comments and work with the EPA's Regulatory Reform Task Force to identify specific rules that can be repealed, replaced, or modified while not affecting the continued advancements in fuel economy and emissions reductions. While an on-going iterative process is most likely necessary to identify regulatory opportunity, the major mobile source needs of the automotive industry can be broken down into three categories: revision and elimination of duplicative and unnecessary requirements, streamlining of certification and approval processes, and ensuring all vehicles and fuels are subject to performance-based metrics.

Duplicative and unnecessary requirements add time and complexity to the development and sale of new vehicles. Multiple vehicle regulatory programs at the Federal and State levels[2] require separate and duplicative reporting, accounting, and testing. For example, EPA and California have adopted nearly identical procedures for testing and reporting. The EPA should work with California and related stakeholders to either eliminate these duplicative procedures or apply broad "deemed to comply" provisions.

Streamlining the certification and approval processes is also important to industry. Highly concerning is the increased uncertainty and delays to the certification process caused by recently added undefined portable emissions measurement testing, unclear interpretation of auxiliary emissions control devices, and inconsistent approvals of GHG off-cycle credit requests. More certainty is needed for an already highly regulated industry. Regulatory interpretation is at the root of many of the certification challenges that the industry is facing and could be addressed either via guidance or through regulatory modifications.

While we encourage streamlining of the certification process, we are concerned over recent news surrounding the Administration's proposed budget cuts for the agency and the possible negative implications for vehicle certification. Although streamlining may assist the Administration to achieve some of the proposed budgetary goals, the Alliance would like to point out that EPA staff engaged in vehicle certification are critical to our industry and the economy. In addition, fees are currently structured to cover certification and compliance costs. We would be happy to follow up regarding the current fees that manufacturers already provide for critical EPA operations.

Lastly, equal treatment across all fuels and vehicle technologies is another key factor in ensuring a level playing field among automotive competitors. Automobile manufacturers should

---

1 Energy Policy and Conservation Act, as amended, 49 U.S.C. § 32902(f).

2 EPA GHG, California Air Resources Board ("CARB") GHG, NHTSA CAFE, Section 177 State GHG programs, CARB Zero Emissions Vehicle Program ("ZEV"), Federal On-Board Diagnostics ("OBD"), CARB OBD, Section 177 State ZEV and LEV programs, EPA Tier 3, and ARB LEV 3.

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not be held responsible for emissions associated with the production of electricity ("upstream emissions") as has always appropriately been the case for petroleum products. This includes both upstream fuel accounting and test procedures. As described in past Alliance comments, manufacturers should not carry the burden of addressing emissions from the production of fuels by other regulated entities that are completely independent of automotive manufacturers. Fuels should not be discredited or penalized at the tailpipe, but rather what is measured should be reported. Furthermore, diesel-fueled vehicles should be allowed the same durability procedures as similar advanced gasoline technology vehicles.

Once again, thank you for the opportunity to share our ideas. The Alliance and its members are highly interested in both regulatory reform and fuel economy standards. We intend to participate in upcoming regulatory reform stakeholder events and follow up with you and your staff on additional suggestions and specifics. We look forward to working with you to further reduce emissions and alleviate unnecessary regulatory burdens while improving fuel economy in a sustainable manner.

Sincerely,

Mitch Bainwol

Attachment: Letter from Mitch Bainwol and John Bozzella to Administrator McCarthy and Administrator Rosekind Re: Petition for Direct Final Rule with Regard to Various Aspects of the Corporate Average Fuel Economy Program and Greenhouse Gas Program.

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GlobalAutomakers

Mark Rosekind, PhD
Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue, S.E.
Washington DC 20590

June 20, 2016

Gina McCarthy
Administrator
Environmental Protection Agency
Office of the Administrator 1101A
1200 Pennsylvania Avenue, N.W.
Washington DC 20460

Re: Petition for Direct Final Rule with Regard to Various Aspects of the Corporate Average Fuel Economy Program and the Greenhouse Gas Program

Dear Administrators Rosekind and McCarthy:

This is a petition for a Direct Final Rule pursuant to 49 CFR § 553.14 and 5 U.S.C. § 553(e) requesting that the National Highway Traffic Safety Administration (NHTSA) and the U. S. Environmental Protection Agency (EPA) exercise their authority[1] to address various inconsistencies between the Corporate Average Fuel Economy (CAFE) regulatory program and the light-duty vehicle greenhouse gas (GHG) emissions regulations and to address additional inefficiencies in the programs.

The Petitioners, the Alliance of Automobile Manufacturers and the Association of Global Automakers (jointly known as the trade associations), are trade associations representing manufacturers of automobiles, as defined by the Energy Policy and Conservation Act (EPCA), 49 U.S.C. § 32901, et. seq..[2] The Petitioners submit this petition on behalf of their member companies.

[1] 49 USC § 32901 et. seq.

[2] The Alliance of Automobile Manufacturers is an association of 12 vehicle manufacturers which account for roughly 77% of all car and light truck sales in the United States. These members are BMW Group, FCA US LLC, Ford Motor Company, General Motors, Jaguar Land Rover, Mazda, Mercedes-Benz USA, Mitsubishi Motors, Porsche Cars North America, Toyota, Volkswagen Group of America, and Volvo Car USA.

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The actions requested are appropriate as a Direct Final Rule because they are essentially technical amendments relating to inconsistencies, errors, or procedural issues with respect to the CAFE and GHG programs. They do not impact the stringency of the standards as originally intended, nor are they contrary to the underlying analyses upon which the standards were based. The Petitioners seek expeditious action on the requested changes in order to address pending issues affecting many of our members, and to provide certainty in compliance planning.

On May 21, 2010, President Obama issued an Executive Order directing NHTSA and EPA to develop a "coordinated national program" of "joint Federal standards" to improve automobile fuel efficiency and reduce GHG emissions from light-duty vehicles. The National Program was premised on harmonization between the two programs. Many trade association member companies entered into Commitment Agreements with NHTSA and EPA through which they committed to abide by a harmonized set of CAFE and GHG standards for Model Years 2012-2025.[3]

The specific regulatory changes that the trade associations request are set forth in detail in this petition, along with supporting material demonstrating that the proposed changes are aligned with widely accepted policy goals, are technically sound, and are consistent with the relevant statutes. Some of the requested changes relate to aspects of the CAFE rules that result in a greater level of stringency than the GHG program. The CAFE standards are required to be set at a level that is technologically and economically feasible without the need to pay CAFE fines. To the extent that discrepancies and correctable inefficiencies in the program could force manufacturers to pay CAFE fines despite being able to meet the GHG standards, the CAFE standards are beyond what should be considered "maximum feasible." This petition does not address the feasibility of the augural CAFE standards for MYs 2022-2025, and making the changes requested here would not have a material impact on the feasibility of those standards. Rather, these changes are necessary to bring the overall CAFE program into better alignment with the "maximum feasible" level of fuel economy for MYs 2010-2021.

The National Program is Premised on Harmonization

From the beginning, the National Program was intended to result in a joint rule to set standards for both the GHG and CAFE programs that would allow automakers to comply with both programs through a single unified fleet. As noted by the agencies when announcing the MY 2017-2025 standards: "the goal . . . is to establish harmonized federal standards such that automobile manufacturers will be able to build a single light-duty national fleet that satisfies all

[3] The Commitments from the Petitioners and from EPA and NHTSA were set forth in letters dated May, 2009 (with regard to the MY 2012-2016 standards), May, 2010 (with regard to continuing the process), and July, 2011 (with regard to the MY 2017-2025 standards).

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federal and state requirements, while enabling consumers to still have a full range of vehicle choices."[4]

The National Program has been operational since MY 2012, and both manufacturers and the agencies have now had the benefit of experiencing how the elements of the programs and the market have impacted the ability of manufacturers to comply with both programs through a single fleet and technology array.[5] With the perspective of hindsight, it is clear that certain discrepancies between the two programs have prevented the level of harmonization sought and anticipated. Some manufacturers are projecting that, despite being able to comply with the numerically more stringent GHG standards, they are likely to be in a position to pay CAFE fines. This was not the intent of the National Program.

Petitioners' member companies anticipate that some of these impediments, which are apparent already for purposes of the MY 2012-2016 standards, will continue to be impediments for MYs 2017-2025.

The Petitioners acknowledges that EPCA contains certain constraints preventing full harmonization between the two programs. This petition does not request that the agencies attempt to harmonize the CAFE and GHG programs in a manner that contravenes statutory directives. Certain aspects of the programs will require legislative change to ensure consistency, and include the following:

> EPCA limits the maximum increase in any compliance category attributable to transferred credits. *See* 49 U.S.C. § 32903(g)(3). The GHG program includes no such limitation, and therefore offers a more significant incentive to deploy advance technologies early in order to cover unexpected market fluctuations, product planning assumptions that prove inaccurate, product changeover plans, or to provide credits to the market.
>
> EPCA limits the number of years an earned credit may be applied to a manufacturer's compliance calculation. EPCA allows credits to be used for five model years forward and for three model years back. EPA has harmonized with this constraint, but further allowed a one-time carry forward to allow credits earned in MYs 2010-2016 to be used through

[4] During the initial implementation of the National Program, the agencies noted in the 2010 rule that "NHTSA and EPA's standards would require *slightly different* fuel efficiency improvements." 75 Fed. Reg. 25324, 25342 (May 7, 2010) (emphasis added). The agencies did not expect significantly different fuel efficiency improvements in order to meet the CAFE standards in addition to the GHG standards.

[5] As described in more detail below, some aspects of the program have been applied to MYs prior to 2012. Where appropriate, the agencies should adopt the changes in the CAFE program beginning with the same model year that they became operative in the GHG program.

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MY 2021. Due to the statutory limitation, that same consideration cannot be accorded within the CAFE program.[6]

The agencies, however, have the ability to address a number of other inconsistencies without jeopardizing the fuel consumption benefits associated with the standards. In particular, and for the reasons set forth below, petitioners request that the agencies harmonize the programs as follows:

The Petitioners request that EPA and NHTSA calculate the fuel economy for a manufacturer's fleets for MYs 2010-2016 taking into account off-cycle technologies at the same levels and in the same way as EPA accounts for those technologies in the GHG program. Doing so would not erode the overall benefits of the CAFE standards or the National Program. The Petitioners recognize that EPA, in conjunction with NHTSA, has taken into account such off-cycle technologies in calculating compliance with the MYs 2017-2025 standards. Similar treatment would be just as appropriate with regard to the earlier model years consistent with EPA's recognition of off-cycle technology beginning in 2010.

The Petitioners request that EPA and NHTSA calculate the fuel economy for a manufacturer's fleets for MYs 2010-2016 taking into account air conditioning efficiencies at the same levels and the same ways as EPA is accounting for those efficiencies in the GHG program. Below we provide an approach that would grant such credits while also accounting for the differences in the stringency of the GHG and CAFE standards that was based on originally not having included these credits in the CAFE standards.

The Petitioners request that NHTSA apply the adjustment factor, beginning in Model Year 2011, when credits are carried forward or carried back within a compliance category, as well as when they are traded and transferred. The adjustment factor in 49 C.F.R. Part 536 was established by NHTSA in response to the Congressional mandate to ensure, when creating a program for trading credits between manufacturers, that overall oil savings remains the same. EPA has a different approach to ensuring the consistency of the benefits in the GHG program. The change being requested in this petition would help to harmonize the two approaches since the adjustment factor equates the CAFE credit to a linear function similar to the way in which credits are applied in the GHG program.

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[6] EPA has made additional allowances to harmonize the GHG program with the CAFE program despite an absence of statutory constraints. For example, EPCA specifies certain values for dual-fueled vehicles, which values EPA has adopted through MY 2015. Additionally, for purposes of establishing CAFE standards, EPCA assumes that fuel economy will be measured only with regard to fuel consumption during vehicle travel. The CO_2 program also accounts for emissions reductions that are not associated with the fuel economy cycle testing. EPA and NHTSA have resolved this discrepancy by recognizing that EPA has the authority to determine how to calculate fuel economy, an authority which allows EPA to take such "off-cycle" improvements into account and provide appropriate incentive in both programs for the substantial benefits represented by such technologies.

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The Petitioners request that NHTSA reconsider its decision not to harmonize with EPA by using the same, fixed Lifetime Vehicle Miles Traveled (VMT) values in the adjustment factor for MYs 2011-2016. NHTSA's VMTs for MYs 2011-2016 are generally lower than those derived from the 2009 National Household Travel Survey, even without the VMT growth rate assumed by the agencies, with the result that the adjustment factor is artificially low. As noted in the rulemaking analyses, while EPA's approach is similar to NHTSA's approach, it provides for better year-over-year consistency and accounts for the external factors that impact the VMT calculation. Since the fixed VMT value being employed incorporates an average which includes the earlier model years, applying it to those model years is analytically consistent.

Petitioners request NHTSA revise the definition of the term "transfer" in 40 CFR 536.3 to be consistent with language in the 2010 preamble of the proposed rulemaking for 2017-2025 GHG/CAFE standards. This revision would more closely align the NHTSA credit transfer program with that of the EPA GHG provisions as was the expressed intent in the 2010 preamble language.

In addition to the above, the Petitioners request that the agencies allow manufacturers to manage their credit supply and use. We note that, while the manufacturer model year reports[7] track certain credits separately, such as the off-cycle credits, and appear to allow manufacturers the ability to apply either those credits or over-compliance credits as they choose, in a recent publication EPA stated instead that technology credits must be applied before any over-compliance credits are applied.[8] The Petitioners request that, rather than imposing a priority system on the application of credits, the agencies allow manufacturers to choose how to apply their available credits.

The Petitioners also request that each agency take the following actions. While not giving rise to direct conflicts between the programs, the following issues involve potential difficulties that could lead to compliance disparities and/or that are inconsistent with the original intent of the programs.

The Petitioners request that NHTSA adjust the minimum domestic passenger car standard for MYs 2012-2016 to reflect 92% of the required average passenger car standard taking into account the fleet mix as it occurred, rather than what was forecast. Doing so better aligns the overall CAFE performance values with real world results and EPA's calculations, and is fully consistent with the statute.

The Petitioners request that EPA and NHTSA provide for a default acceptance of petitions for off-cycle credits, provided that all required information has been provided. Limited agency resources have delayed the processing of these petitions, and the delay

[7] See 40 CFR 600.512-12

[8] Environmental Protection Agency. "Greenhouse Gas Emissions Standards for Light-Duty Vehicles – Manufacturers Performance Report for the 2014 Model Year" (EPA-420-R-15-026). December 2015. (P. 17)

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impedes manufacturers' ability to plan for compliance or make investment decisions. Streamlining the process will further promote a more efficient and better harmonized National Program.

The Petitioners request that EPA remedy the equation applied to calculate the multiplier credits available in the GHG program. As the agency is aware, the calculation that is currently in the regulatory text does not reflect the intent, with the result that manufacturers earn fewer multiplier credits than was originally intended. This important flexibility was intended to encourage the ongoing production of zero emission vehicles, and achieving the full flexibility is particularly important in an environment of lower gasoline prices. Although not directly related to harmonization, the Petitioners believe that it would be appropriate for EPA to additionally address this error when processing this petition.

The above items are appropriate for the agencies to handle through a Direct Final Rule. The requested modifications would change neither the stringency levels of the standards themselves nor the overall benefits achieved through the National Program. The modifications requested in this petition are therefore suited to a Direct Final Rule. While there may be other opportunities for EPA and NHTSA to enhance harmonization between their two programs, the items discussed in this Petition represent a meaningful step in the right direction.

Specific Requests

This section sets forth the specific requests for modifications to the regulations, along with the supporting rationale for each request.

1. Include Off-Cycle Credits in the CAFE Calculation for MYs 2010-2016

The agencies should take appropriate steps to calculate corporate average fuel economy for MYs 2010-2016 more consistently with how corporate average fuel economy is to be calculated for MYs 2017-2025 by including in the CAFE compliance calculation the same off-cycle credits applied in the GHG program for earlier model years. Significantly, EPA acknowledged off-cycle credits beginning with MY 2010.

In 2012, EPA and NHTSA finalized action to acknowledge off-cycle credits equally in the CAFE program through EPA's authority to calculate a manufacturer's fuel economy performance. NHTSA, however, resisted applying those credits to earlier model years as EPA had done.

NHTSA's decision not to do so was premised on an erroneous assumption that NHTSA had fully accounted for the benefits of those technologies in the later model years, while it had not done so for earlier model years. In fact, however, neither EPA nor NHTSA took those benefits into account (instead creating a pure incentive) and, therefore, the agencies can maintain

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consistency by providing the credits in both programs for all model years, starting with MY 2010.

Significantly, the GHG standards -- like the corresponding CAFE standards -- did not include any quantification of the impacts of the off-cycle credits approved for use during MYs 2012-2016. 75 Fed. Reg. at 25438 ("Because these technologies are not nearly so well developed and understood, EPA is not prepared to consider them in assessing the stringency of the CO_2 standards").[9] Similarly, the agencies did not consider the benefits of off-cycle technologies in setting the standards for MYs 2017-2025, other than the 2-cycle benefits of stop-start and active aerodynamics.[10]

NHTSA nevertheless declined to apply the same off-cycle credits to earlier model years as EPA had done, noting only that "NHTSA did not take such credits into account when adopting the CAFE standards for those model years. As such extending the credit program to the CAFE program for those model years would not be appropriate." 77 Fed. Reg. at 62840. That statement, however, appears inconsistent with the considerations of off-cycle credits as more specifically described within the rulemaking analyses. Indeed, in addition to the fact that neither EPA nor NHTSA accounted for those benefits – other than the 2-cycle benefits of stop-start and active aerodynamics in the MY 2017-2025 rule -- NHTSA's analysis of "maximum feasibility" in the 2010 preamble makes clear that the agency did in fact consider all relevant technologies, and did so in a way that the agency announced were "consistent standards among all components of the National Program." 75 Fed. Reg. at 25607. [11]

The Petitioners request that the agencies reconsider calculating fuel economy for the earlier model years, and applying the same off-cycle credits offered in the GHG program in the CAFE program as well.

Recommendation: Section 600.510-12 Calculation of average fuel economy and average carbon-related exhaust emissions. Subsection (c)(1):

Change From:

(i) Except as allowed in paragraph (d) of this section, the average fuel economy for the model years before 2017 will be calculated individually for each category identified

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[9] Consistent with the fact that neither EPA nor NHTSA included off-cycle credits in their stringency analyses, NHTSA did not adjust its standards to account for off-cycle credits when EPA adopted them. The result is that, while the stringency of the standards is nominally the same as it regards off-cycle technology (other than air conditioning), EPA provided a full incentive for the introduction of innovative and novel technologies during the MY 2012-2016 timeframe, while NHTSA did not.

[10] The agencies noted that "the ability to generate off-cycle credits and increases in fuel economy for use in compliance will not affect or change the stringency of the GHG or CAFE standards established by each agency."

[11] Although EPCA does not require that CAFE standards meet a cost/benefit analysis, the agency noted that it is permitted to conduct one. See, e.g., 75 Fed. Reg. at 25553 and Center for Biological Diversity v. NHTSA, 508 F.3d 508 (9th Cir. 2007) The substantial benefits of the CAFE standards, which overlap with the benefits of the overall National Program, illustrate that the CAFE program, as modified, would continue to provide substantial societal benefits far beyond the societal costs. There would be no erosion of the beneficial impact of the CAFE standards.

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in paragraph (a)(1) of this according to the provisions of paragraph (c)(2) of this section.

(ii) Except as permitted in paragraph (d) of this section, the average fuel economy for the 2017 and later model years will be calculated individually for each category identified in paragraph (a)(1) of this section using the following equation:

Average MPG = 1/[1/MPG-(FCIVac + FCIVoc + FCIVpu)]

Change to:

(i) Except as permitted in paragraph (d) of this section, the average fuel economy for the 2010 through 2016 model years will be calculated individually for each category identified in paragraph (a)(1) of this section using the following equation:

Average MPG = 1/[1/MPG-(FCIVoc)]

(ii) Except as permitted in paragraph (d) of this section, the average fuel economy for the 2017 and later model years will be calculated individually for each category identified in paragraph (a)(1) of this section using the following equation:

Average MPG = 1/[1/MPG-(FCIVac + FCIVoc + FCIVpu)]

2. *Include Air-Conditioning Efficiency Credits in the CAFE Calculation for MYs 2010-2016*

For similar reasons, the agencies should also permit the use of air conditioning efficiency credits in MYs 2010-2016 consistent with the agencies' approach to MYs 2017-2025. In the rule for the earlier years, the agencies accounted for the difference of including these credits in one program but not the other by adjusting the overall stringency of the standards for MYs 2012-2016. While the GHG standards amounted to an overall targeted level of 35.5 mpg, the CAFE standards amounted to an overall combined fleet target level of 34.1 mpg in 2016. The Petitioners propose an approach that provides full harmonization by allowing such credits for MYs 2010-2016 while also taking into account the difference in the levels of the standard.

The disparity between the standards creates a situation in which a manufacturer that includes more efficient air-conditioning systems than those assumed by EPA for the industry as a whole is penalized in the CAFE program by not receiving the same consideration provided in the GHG program. The below graph illustrates the substantial, and unnecessary distinction, between the two programs due to this disparity:

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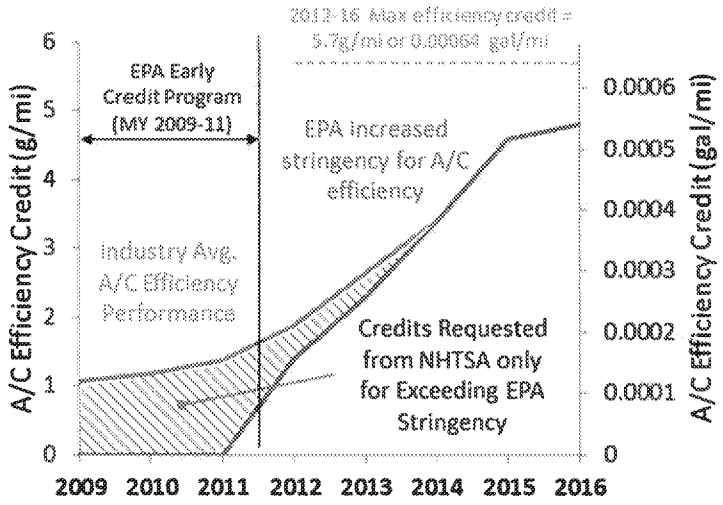

The blue line represents the amount of air-conditioner efficiency credits EPA projected for the fleet, including the stringency beyond the CAFE standards. The red line shows how the industry performed on average. The shaded area between the two shows the credits disregarded in the CAFE program, already accounting for the difference in the stringency of the standards.

In developing the program, EPA assumed a maximum benefit of 5.7 g/mi due to air conditioning efficiency credits. The chart below shows the projected penetration rate and the total CO_2 credit in the EPA program based on that penetration rate. The Petitioners suggest that the agencies apply a formula ($FCIV_{ACPROJ}$) to adjust that credit to account for the difference in stringency between the programs.

For example, if a manufacturer deployed MAC efficiency technology worth 3.1 g CO_2/mile across its MY 2013 fleet, the full credit for CAFE would have been a FCIV of 0.00035 (3.1/8887). However, since the stringency would also have been increased in MY 2013 by a FCIV of 0.00026, the net effect would be 0.00009 gallons/mile.

Model Year	2009-11	2012	2013	2014	2015	2016
Projected Penetration Rate	N/A	28%	40%	60%	80%	85%
CO_2 Credit (5.7 g/mi x Penetration Rate)	0	1.6	2.3	3.4	4.6	4.8
$FCIV_{AC\ PROJ}$ (gallons/mile, CO_2 credit/8887)	0	.00018	.00026	.00038	.00052	.00054

As with the off-cycle credits, the agencies can harmonize the programs while maintaining the same levels of overall stringency and remaining consistent with the analyses previously set

forth. With the benefit of hindsight, it has become clear that the program disparities are unnecessarily undermining the intent of the National Program.

Recommendation: Section 600.510-12 Calculation of average fuel economy and average carbon-related exhaust emissions. Subsection (c)(1):

Change From:

(i) Except as allowed in paragraph (d) of this section, the average fuel economy for the model years before 2017 will be calculated individually for each category identified in paragraph (a)(1) of this according to the provisions of paragraph (c)(2) of this section.

Change to:

(i) Except as permitted in paragraph (d) of this section, the average fuel economy for the 2010 through 2016 model years will be calculated individually for each category identified in paragraph (a)(1) of this section using the following equation:

Average MPG = 1/[1/MPG-(FCIVoc)-max(0,(FCIVac –FCIVac proj))]

Where FCIVac proj is from the table above. FCIVoc is for off-cycle credits discussed above.

3. Apply the Fuel Savings Adjustment Factor Across Model Years

The Petitioners request that NHTSA modify the fuel savings adjustment factor by making it applicable when credits are carried forward or carried back within the same fleet. When Congress authorized a credit trading program between manufacturers, it also mandated that NHTSA ensure that total oil savings be preserved. *See* 49 U.S.C. § 32903(f)(1). Congress did not include the same provision in the provision mandating a credit transfer program between the fleets, but NHTSA decided that such a provision was appropriate. *See* 49 U.S.C. § 32903(g); 74 Fed. Reg. 14,452 (March 30, 2009). As a result, the adjustment factor established in Part 536 applies to both.

It has long been recognized that fuel savings is not linear with fuel consumption. The amount of fuel consumed by exceeding a standard by 1 mpg will vary based on the level of the standard. Although carry forward/carry back credits were used for many years, for much of that time – during the years of the Congressional CAFE freeze – the standards did not change and therefore credits were associated with the same amount of fuel savings from year to year. When developing the credit trading and credit transfer programs, and establishing the adjustment factor, consideration was not given to also applying the adjustment factor between model years within the same compliance fleet. The theory, however, remains the same and the adjustment factor would ensure that total oil savings are achieved regardless of when and where the credits are used. We recognize there may be some accounting challenges associated with implementation of

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this concept. We look forward to working with you to consider and develop an appropriate process to consider and account for these situations.

Recommendation: Section 536.4 Credits. Subsection (c):

Change From:

(c) Adjustment factor. When traded or transferred and used, fuel economy credits are adjusted to ensure fuel oil savings is preserved. For traded credits, the user (or buyer) must multiply the calculated adjustment factor by the number of its shortfall credits it plans to offset in order to determine the number of equivalent credits to acquire from the earner (or seller). For transferred credits, the user of credits must multiply the calculated adjustment factor by the number of its shortfall credits it plans to offset in order to determine the number of equivalent credits to transfer from the compliance category holding the available credits. The adjustment factor is calculated according to the following formula:

Change to:

(c) Adjustment factor. When traded or transferred and used, fuel economy credits are adjusted to ensure fuel oil savings is preserved. ***This adjustment factor also applies to credits used within a manufacturer's same fleet, i.e. domestic car to domestic car.*** For traded credits,..."

4. Apply the Harmonized VMT Estimates from MYs 2017-2025 to MYs 2011-2016

The Petitioners request that NHTSA reconsider its position with regard to the estimate of Vehicle Miles Traveled (VMT) used in the adjustment factor. For MYs 2012-2016, the agency had estimated VMT separately by model year and, in 2012 added an additional estimate for MY 2011. For MYs 2017-2025, NHTSA proposed to align with EPA and used a fixed VMT value approach. In response to a comment from the Alliance, NHTSA decided against applying the same fixed values to the earlier model years, stating that "we do not believe that the benefits of harmonization in this particular aspect for these model years outweigh the potential fuel savings losses that may occur if a change is made at this time." 77 Fed. Reg. at 63130.

With the benefit of hindsight, it is clear that no fuel savings were, in fact, lost. Instead, because VMT for the earlier model years, as derived from the 2009 National Household Travel Survey, were generally higher than NHTSA's projections, the amount of fuel savings per credit was actually undervalued. NHTSA should, at the least, update the VMT estimates to the best VMT estimates to reflect better the real world fuel economy results.[12]

[12] Petitioners acknowledge that adjusting the VMT estimates would present further challenges to those companies which may have traditionally run at a CAFE deficit and for whom accommodations were made to assist in the transition from a CAFE program permitting the payment of civil fines in lieu of compliance to the GHG program where non-compliance is not an option. Petitioners suggest that if a company is entitled to participate in the

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Estimated VMT represents an analysis that takes into account various factors impacting the extent to which consumers use their vehicles. Considerations wholly external to motor vehicle manufacturers and motor vehicle regulators impact each year's VMT. To derive a reasonable estimate, EPA conducted its analyses and averaged the calculated, anticipated VMT for MYs 2012-2030. While micro- and macro-economic considerations may impact VMT year-by-year, the averaging approach provides a consistent and reasonable basis (as evidenced by the fact that both agencies have adopted it prospectively) to proceed.

In the Regulatory Impact Analysis for MYs 2017-2025, the agencies noted that NHTSA's approach to estimating VMT closely approximated EPA's approach for those model years. (*See* 2012 Regulatory Impact Analysis, pp. 4-118-119). EPA made adjustments to its VMT modeling "to improve consistency with the CAFE model and with the analysis used to collect the VMT and survival rate data." (RIA, p. 4-121). The RIA further indicates that EPA's approach "is consistent with the MYs 2012-2016 rule. . . . The use of a single growth factor ensures consistency with the AEO projections about future micro and macroeconomic trends and underlying assumptions about consumer responsiveness to those trends." (RIA, p. 4-119, n. www)

According to the agencies' Regulatory Impact Analysis, the EPA approach is both similar to the NHTSA approach and similar to the approach EPA used for the earlier rulemaking. The EPA model is considered a reasonable estimate of future VMT, taking into account the various economic factors that impact VMT. Any assumed loss of fuel savings, therefore, would appear to be a "paper loss" based solely on NHTSA's estimate, not an actual loss based on statistical analyses the agencies have jointly decided to use prospectively.

Harmonizing VMT estimates for all model years of the National Program is particularly important to maintain consistency in manufacturer's compliance planning in light of market conditions. Credit flexibilities – particularly those that align more fully with EPA – are critical to providing the needed support to ensure that a company can meet the requirements of both programs with the same fleet of vehicles. Since NHTSA's VMT estimates appear to have artificially diminished the value of each credit, and since EPA's VMT approach has been modified to align well with CAFE and has been adopted by both agencies as a valid methodology, the Petitioners request that NHTSA reconsider its position and apply the EPA VMT estimates to MYs 2011-2016.

Recommendation: Section 536.4 Credits. Subsection (c):

Change From:

VMTe = Lifetime vehicle miles traveled as provided in the following table for the model year and compliance category in which the credit was earned;

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transitional TLAAS program, and would be adversely impacted by the VMT adjustment, that company should be allowed a one-time option to retain the original VMT estimates.

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VMTu = Lifetime vehicle miles traveled as provided in the following table for the model year and compliance category in which the credit is used for compliance;

Change to:

VMTe= 195,264 for passenger cars and 225,865 for light duty trucks

VMTu= 195,264 for passenger cars and 225,865 for light duty trucks

5. *Revise NHTSA Credit Transfer Definition to be More Consistent with EPA*

The Petitioners request NHTSA revise the definition of the term "transfer" in 40 CFR 536.3 to be consistent with language in the 2010 preamble of the proposed rulemaking for 2017-2025 GHG/CAFE standards.

In the 2010 rulemaking, NHTSA made an effort to harmonize, to the extent allowable under the CAFE statute, its credit transfer program with EPA's GHG credit transfer approach. In the preamble to that rulemaking, NHTSA stated: "As a way to improve the transferring flexibility mechanism for manufacturers, NHTSA interprets EISA not to prohibit the banking of transferred credits for use in later model years." Thus, credits could be transferred from one fleet to another (subject to the statutory limitation in 49 USC 32903 (g)(3)), banked in the receiving fleet, and then the "credits could be carried forward or back without limit later if and when a shortfall ever occurred in that same fleet." 75 Fed. Reg. at 25666. Such a treatment of over-compliance credits is illustrated below:

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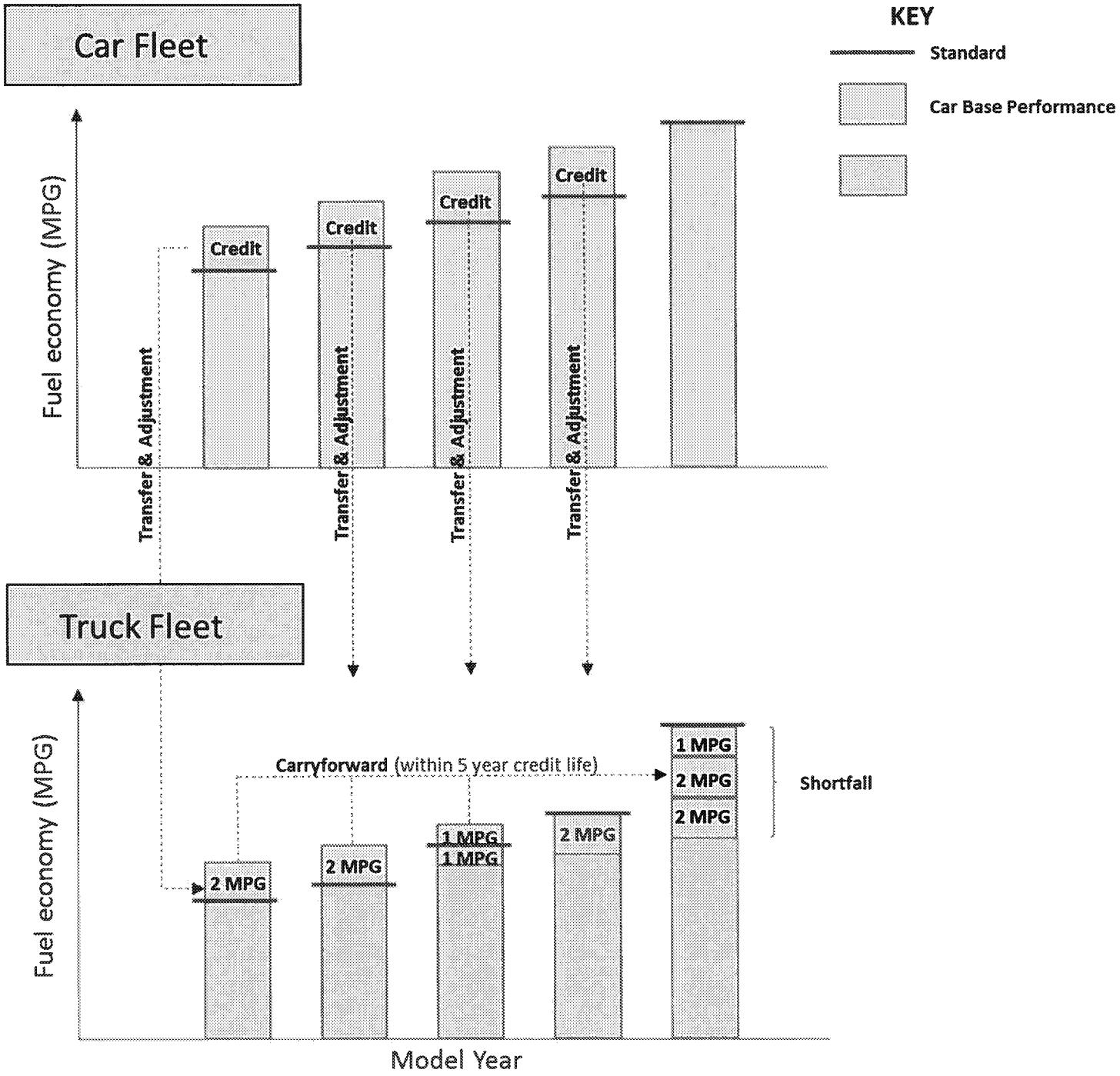

Note: Scenario showing 2 mpg credit transfer limit.

However, in a subsequent interpretation letter to a manufacturer, NHTSA moved away from the language in the preamble and stated that its intent was to apply the statutory limitation at the time the credits are used, as opposed to the time they were transferred and banked by a

manufacturer.[13] The result of this interpretation prohibits the banking and carryforward of credits illustrated in the figure above which is inconsistent with the preamble's stated intent "to harmonize better with EPA's CO2 program." This regulatory interpretation makes the NHTSA and EPA programs very different with regard to the flexibility to earn and use credits for over-compliance with required standards, since EPA allows unlimited transfer of GHG credits between a manufacturer's fleets. This disharmony creates unnecessary burdens and creates unnecessary complexity between the NHTSA and EPA programs.

Recommendation:

At the end of the existing definition of the term "Transfer" in 49 CFR 536.3, add the following:

> The limitation in 49 USC 32903(g)(3) shall apply at the time such credits are transferred. Once transferred, the credits are considered part of the receiving fleet and may be carried forward or back to the same extent that they could have before being transferred. The adjustment factor will be applied at the time credits are used to achieve compliance.

6. *Refrain From Imposing Unnecessary Restrictions on The Use of Credits*

Both the CAFE program and the GHG program were intended to allow manufacturers to earn credits and to utilize those credits as they deem appropriate to cover any shortfalls. Permitting the companies to manage their credits allows manufacturers to take into account future technology planning. This means that manufacturers with more credits than needed to cover an immediate shortfall should be able to choose which bank of credits to draw from to cover the shortfall and which to hold for future model years.

The Petitioners are concerned about the following language appearing in EPA's Manufacturer's Performance Report for the 2014 Model Year:

> Every manufacturer starts at the same place: by measuring the CO2 tailpipe emissions performance of their vehicles using EPA's City and Highway test procedures (referred to as the "2-cycle" tests). Then they may choose to apply a variety of optional technology-based credits to further reduce their fleet GHG emissions compliance value. The 2-cycle tailpipe CO2 value, when reduced by the net grams/mile equivalent of the optional credits, determines a manufacturer's model year performance and whether credits or deficits are generated by a manufacturer's model year fleet.

EPA-420-R-15-026 (Dec. 2015).

As stated, the language suggests that EPA will initially measure emissions based on the fuel economy testing, and then apply any technology credits (such as off-cycle and air conditioning credits) to determine a manufacturer's fleet performance. Once that performance has been calculated, EPA will determine whether there are over-compliance credits earned or

[13] See letter from O. Kevin Vincent to Toyota dated July 6, 2011.

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available under the GHG program and NHTSA will determine whether there are over-compliance credits available under the CAFE program.

The problem with this approach is that it denies manufacturers the ability to get the full benefit of past model year credits that they have earned under the GHG and CAFE programs. Under the credit banking provisions of both programs, manufacturers may earn credits by overachieving the standards in one model year, and apply those credits to offset shortfalls in a future model year. Under the agencies' prescriptive approach to credit management, technology credits earned in the current model year must be immediately applied toward any deficits in the current model year. This approach forces manufacturers to use their credits in a sub-optimal way, and can result in stranded credits.

We suggest that a better approach to calculating compliance is to measure compliance based on each manufacturer's test results, and then allow the companies to apply earned credits as they see fit. Allowing for that flexibility allows each manufacturer to optimize its planning, and does not reduce overall benefits since the credits have already been earned. Unlike "credits" for advanced technologies and alternative fuel capability, which are included in the base fuel economy performance determination, credits earned for air conditioning leakage and efficiency and for the use of off-cycle technologies are tracked and reported separately for the car and truck fleets in the final model year reports.

Our suggested approach is consistent with the way in which the agencies interpreted credit management in the 2009 – 2011 model years ("early credits"), in which manufacturers were able to apply carry forward credits before current model year earned credits were applied. Manufacturers provided the pre-Model Year reports, in which certain credit categories (such as off-cycle credits and air conditioning leakage and efficiency credits) were tracked and listed separately.

Those credits, as well as other Averaging, Banking, and Trading (ABT) credits, should all be available to companies to apply as they see fit. By inserting an artificial priority on the application of those credits, the agencies are imposing the possibility that some credits may expire before they are allowed to be used. That devalues credit creation and unnecessarily detracts from the incentive to develop and deploy novel technology as early as possible.

The Petitioners request the agencies to reconfirm the original approach to allow manufacturers to manage and apply their credits, regardless of the origin of the credits in their accounts. While the current regulations do not preclude the continuation of this optimal credit management, the regulation should be clarified to inform future guidance.

Recommendation

Amend 40 CFR 86.1865(k)(5) to read as follows:

(5) Total credits or debits generated in a model year, maintained and reported separately for passenger automobiles and light trucks, shall be the sum of the credits or debits calculated in

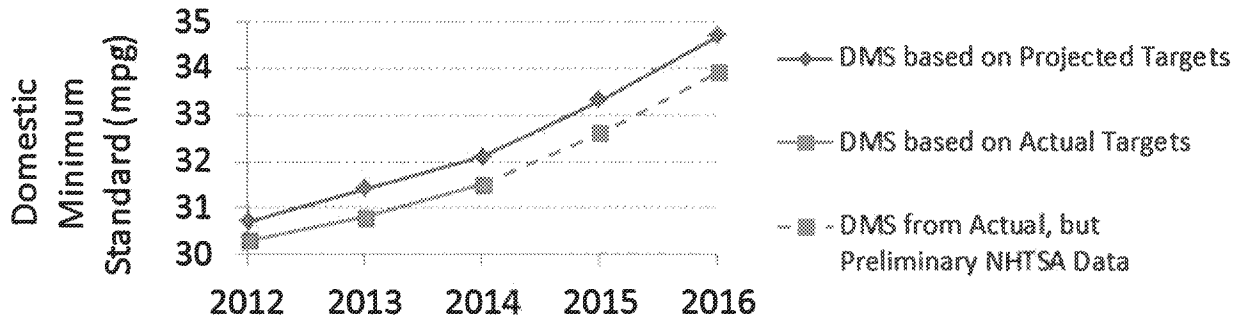
paragraph (k)(4) of this section, ***plus any credits earned in a prior model year and used by the manufacturer to fully or partially offset any such debits in accordance with paragraph (k)(7)(i) of this section, plus*** any of the following credits, if applicable, minus any N_2O and/or CH_4 CO_2-equivalent debits calculated according to the provisions of § 86.1818–12(f)(4):

(i) Air conditioning leakage credits earned according to the provisions of § 86.1867–12(b);
(ii) Air conditioning efficiency credits earned according to the provisions of § 86.1868–12(c);
(iii) Off-cycle technology credits earned according to the provisions of § 86.1869–12(d).
(iv) Full size pickup truck credits earned according to the provisions of § 86.1870–12(c).
(v) N2O and/or CH4 CO2-equivalent debits accumulated according to the provisions of § 86.1818–12(f)(4).

7. *Adjust the CAFE Minimum Domestic Passenger Car Standard to Reflect The Final Standard Applicable to Each Model Year*

NHTSA is required by statute to establish a minimum standard for domestic passenger vehicles that, effectively, is 92% of the average fuel economy projected for the combined domestic and imported passenger automobile fleets manufactured for sale in the United States by all manufacturers in the model year. The projected minimum standard must be published at the same time as the standards upon which they are based and promulgated. *See* 49 U.S.C. § 32902(b)(4).

Fuel economy standards under the attribute-based system should reflect a manufacturer's actual fleet mix. The minimum domestic passenger car standard was intended to protect small car production in the United States by imposing a minimum standard for domestically produced passenger cars. Macro-economic factors play a significant role, however, in the extent to which the projections manifest in later years. Neither the agency nor the manufacturers can fully predict and account for macro-trends impacting the motor vehicle market. As a result, and as NHTSA has intimated in the course of rulemaking, it is appropriate to revisit the projections to base them on the standards for passenger cars that emerge once the fleet mix is settled. The chart below shows the difference that has emerged between the domestic minimum standards based on NHTSA projections and the domestic minimum standard based on the actual passenger car targets.



We believe that the statutory intent was in fact to base the minimum domestic passenger car standard on the final "standard," and not merely on the initial estimate of what the standard might be in the future. This is reflected in the statutory reference to using either the 27.5 mpg traditional passenger car standard or the percentage of the attribute-based standard.

Establishing the minimum domestic passenger car standard in this way takes into account manufacturers' planning as well as unexpected market demand. As long as manufacturers have engaged in a good faith effort to meet the projected minimum domestic passenger car standard, they should not be penalized if market conditions drive consumer choices elsewhere. While the minimum domestic passenger car standard may be well-intentioned, it should be noted that noncompliance despite good faith efforts will not result in more domestic employment, but rather in the unintentional payment of CAFE fines.

Accordingly, NHTSA should adjust the minimum domestic passenger car standard, as finally entered, to reflect 92% of the required average fuel economy passenger car standards in order to maintain consistency with market conditions and the Congressional intent to ensure that efforts are made in good faith to ensure domestic investment in-line with external market forces.

8. *Correct the Multiplier for BEVs, PHEVs, FCVs, and CNGs*

The GHG program includes volume multipliers for low emission vehicles in order to promote the production of these disruptive technologies and to encourage consumer acceptance. Although not a direct harmonization issue, Petitioners' members have noted that the equation through which the number of earned credits is calculated is inaccurately stated in the regulations. The multiplier goes into effect with MY 2017 and this Direct Final Rule would be an appropriate place to correct the inadvertent error.

The illustration below provides a simple example of the credits received and credits inadvertently lost for a manufacturer that sells 5,000 BEVs in 2017-2021 MYs with the multiplier as finalized. The green bars represent the credit received with the multiplier as finalized in the 2017-2025 final rule and the red bars represent the intended credit.

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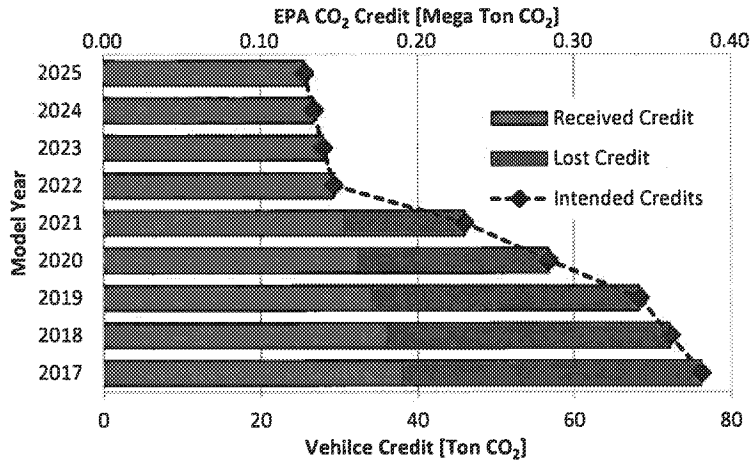


Originally, the volume multiplier was used to compute the fleet averaged carbon related exhaust emissions. The volume multiplier was incorrectly applied to the vehicle volume (when applicable) in 40 CFR 86.1866 (b) (3). The volume multiplier should be applied to the on-cycle vehicle credit (CO2,i Target – CREEi) of the preferred technologies (e.g. BEV, PHEV, CNG, or FCV). The Petitioners request that EPA correct the advanced credit multiplier calculation.

Recommendation

The methodology ultimately adopted should provide the incentive originally intended by the rule while respecting the fact that some manufacturers have already made plans according to the rules as they exist. Because the derivation of the multiplier equation involves several sections of the regulatory text, we are not proposing specific regulatory changes at this time. The final form of the changes, however, would reflect the following:

CFR Version $CO2\ Credits\ or\ Debits = (STD - CREE_{Avg}) \times VLM \times Production, [Mg]$

Corrected $CO2\ Credits\ or\ Debits = (STD_c - CREE_{Avg,c}) \times VLM \times Production, [Mg]$

CFR Averages $STD = \frac{\sum T \times Vol}{\sum Vol}, \left[{}^{g}/_{mile}\right]$ $CREE_{AVG} = \frac{\sum CREE \times Vol \times M}{\sum Vol \times M}, \left[{}^{g}/_{mile}\right]$

Corrected Averages $STD_c = \frac{\sum T \times Vol \times M}{\sum Vol}, \left[{}^{g}/_{mile}\right]$ $CREE_{AVG,c} = \frac{\sum CREE \times Vol \times M}{\sum Vol}, \left[{}^{g}/_{mile}\right]$

Where:
T = Model Type Footprint Target
M = Multiplier
C = "Corrected"

We look forward to working with the Agency in developing the appropriate regulatory changes.

9. *Provide an Improved Off-Cycle Credit Approval Process*

Although EPA has noted the importance of innovative technologies and encouraged the development of off-cycle credits, in some instances, the agency has been unable to process petitions for off-cycle credits as expected. This has occurred even when a manufacturer has provided all of the requisite information specified in the rule. Moving forward, of course, both agencies will be involved in managing that portion of the program and ensuring that the benefits of these innovative technologies are recognized.

In order to maintain the effectiveness of the off-cycle program, the agencies should:

- re-affirm that technologies meeting the stated definitions are entitled to the off-cycle credits at the values stated in the regulation;
- re-acknowledge that technologies shown to generate more emissions reductions than the pre-approved amount are entitled to additional credit;
- confirm that technologies not in the null vehicle set (the null vehicle being a MY2008 vehicle with naturally aspirated, port fuel injection, fixed cam timing engine, 4 speed transmission, and no weight reduction), but which are demonstrated to provide emissions reductions benefits constitute off-cycle credits; and
- modify the off-cycle program to account for unanticipated delays in the approval process by providing that applications based on the 5-cycle methodology are to be deemed approved if not acted upon by the agencies within a specified timeframe (for instance 90 days), subject to any subsequent review of accuracy and good faith.

Conclusion

The Petitioners seek immediate and direct action on the issues above because their resolution will significantly affect petitioners' ability to comply with the CAFE standards moving forward into MYs 2017-2021. While the later standards for MYs 2022-2025 will be subject to reconsideration, during the interim years petitioners face the prospect of complying with the numerically more stringent GHG standards while not being able – even with the same vehicle fleet and same technology application – to meet the corresponding CAFE standards.

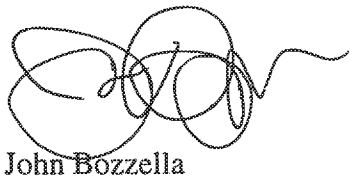
The Petitioners request the agencies issue a Direct Final Rule adopting the modifications set forth above to bring to fruition and to improve the National Program.

The Petitioners look forward to working with the agencies during the mid-term evaluation and analyzing the various technical and policy considerations that will arise during that review.

ED_001276_00002171-00020

We would be glad to meet with Agency staff to answer any question about the material in this petition.

Sincerely,



Mitch Bainwol
President and CEO
Alliance of Automobile Manufacturers

John Bozzella
President and CEO
Association of Global Automakers

ED_001276_00002171-00021

Message

From: David Schwietert [DSchwietert@autoalliance.org]
Sent: 4/27/2017 9:50:20 PM
To: bollen.brittany@epa.gov; Dravis, Samantha [dravis.samantha@epa.gov]
CC: Jennifer Thomas [JThomas@autoalliance.org]; Chris Nevers [CNevers@autoalliance.org]
Subject: RE: re: Auto Alliance follow up - Administrator Pruitt Meeting
Attachments: AdministratorPruittDeck April 27 2017.pptx

And the related charts/slides that were too large to send in one email

Dave

From: David Schwietert
Sent: Thursday, April 27, 2017 5:49 PM
To: bollen.brittany@epa.gov; 'dravis.samantha@epw.gov' <dravis.samantha@epw.gov>
Cc: Jennifer Thomas <JThomas@autoalliance.org>; Chris Nevers <CNevers@autoalliance.org>
Subject: re: Auto Alliance follow up - Administrator Pruitt Meeting

Brittany and Samantha,

We wanted to pass along an electronic copy of the charts and letter that were raised during today's meeting with Administrator Pruitt.

Please let us know if you have any questions – both regarding the Harmonization Petition that was filed jointly with EPA and DOT last June as well as the Mid Term Review for MY 2022-2025 fuel efficiency standards for light-duty vehicles.

Note, when the Harmonization petition was filed last June, we requested a direct fine rule to resolve various issues in hopes of addressing those items ahead of the Draft Technical Assessment Report (TAR) that kicked off the Mid Term Review.
Soon after our petition was filed, EPA/DOT and CARB released their Draft TAR which now means that the issues outlined in the Harmonization petition would more effectively be addressed via a rulemaking process – or handled administratively via interpretations. Additionally, since late 2015 the Alliance has been seeking various Harmonization changes via legislation because certain changes require statutory modification.

It's also important to keep in mind that the Harmonization issues relate to near term compliance (prior to MY 2022) due to increasing disparity between CAFE and EPA credit and compliance requirements. Effectively, the concept of One National Program hasn't been realized and it can create instances in which an auto manufacturer can be in compliance with more stringent EPA requirements and still be forced to pay CAFE penalties. We have a host of other examples that we'd be happy to walk you through to underscore the changes that need to be made in keeping with the original 2010 and 2012 agreements that were advertised as "One National Program" for compliance purposes.

Thanks,

Dave

David Schwietert
Executive Vice President, Federal Government Relations & Public Policy
P: 202-326-5521 | dschwietert@autoalliance.org

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Suite 300
Washington, DC 20001
Main Phone: 202-326-5500
Main Fax: 202-326-5567

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Alliance Board

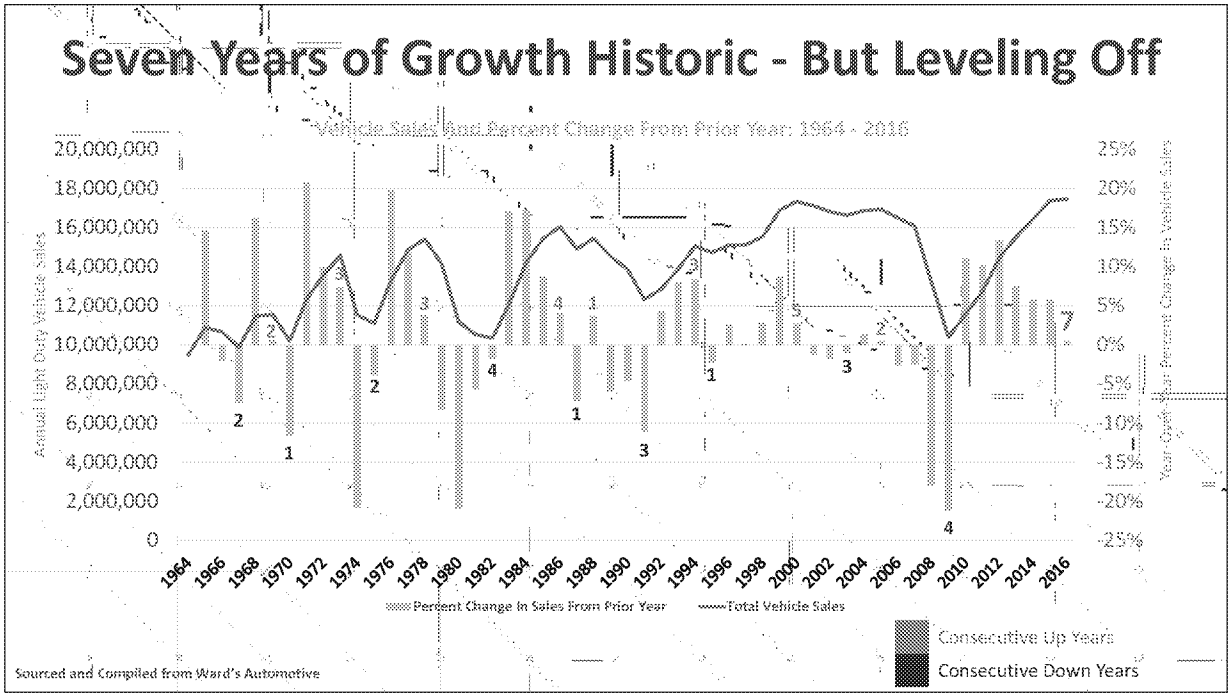
April 27, 2017

AUTO ALLIANCE
DRIVING INNOVATION

Meeting with EPA Administrator Scott Pruitt

AGENDA

1. Welcome	Administrator Pruitt
2. Introduction	Dietmar Exler
3. Situation Review	Mitch Bainwol
4. GHG / Harmonization	Ludwig Willisch / Dan Turton
5. ZEV	Bob Carter


Seven Years of Growth Historic - But Leveling Off
Vehicle Sales and Percent Change From Prior Year: 1964 - 2016
Annual Light Duty Vehicle Sales
Year Over Year Percent Change in Vehicle Sales
20,000,000
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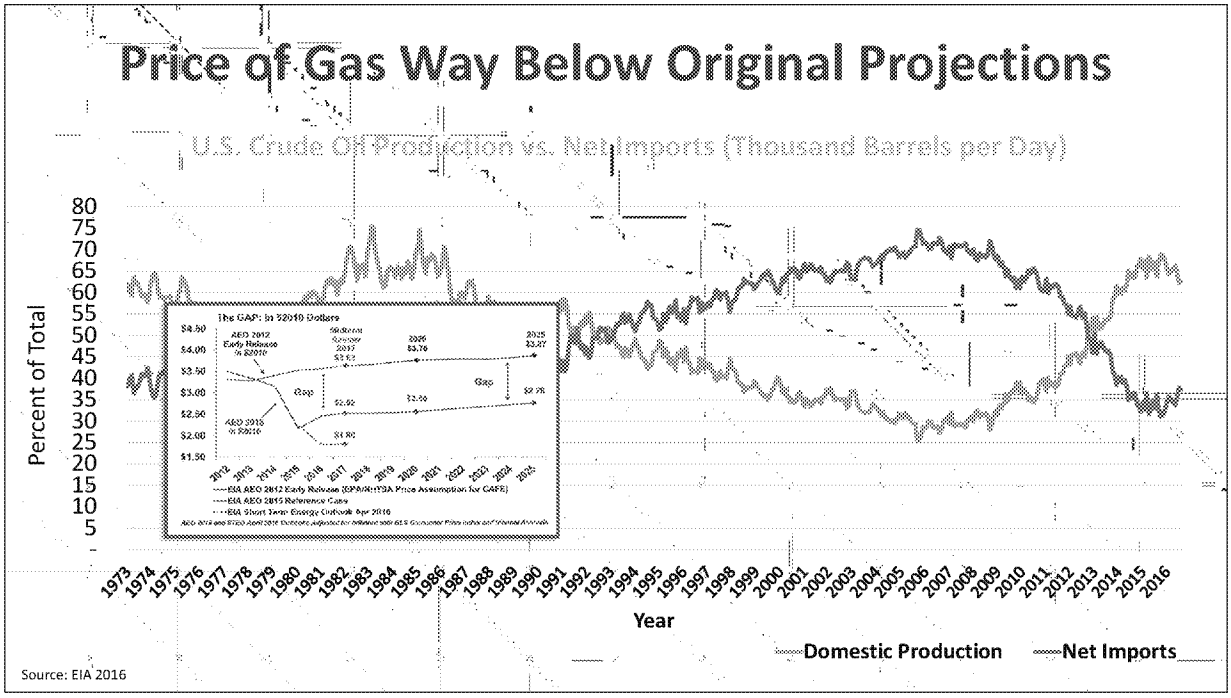
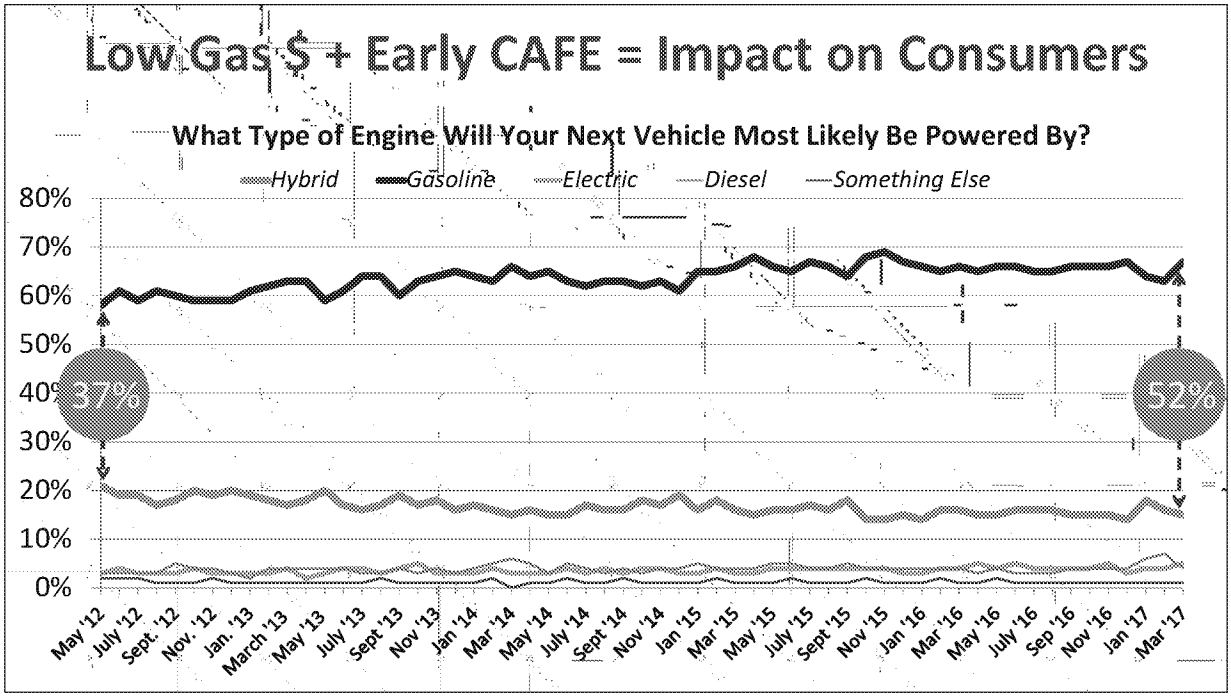
2014
2016
Percent Change in Sales From Prior Year
Total Vehicle Sales
Consecutive Up Years
Consecutive Down Years
Sourced and Compiled from Ward's Automotive


Price of Gas Way Below Original Projections
U.S. Crude Oil Production vs. Net Imports (Thousand Barrels per Day)
Percent of Total
Year
Domestic Production
Net Imports
Source: EIA 2016


Low Gas $ + Early CAFE = Impact on Consumers
What Type of Engine Will Your Next Vehicle Most Likely Be Powered By?
Hybrid
Gasoline
Electric
Diesel
Something Else
80%
70%
60%
50%
40%
30%
20%
10%
0%
37%
52%
May '12
July '12
Sept. '12
Nov. '12
Jan. '13
March '13
May '13
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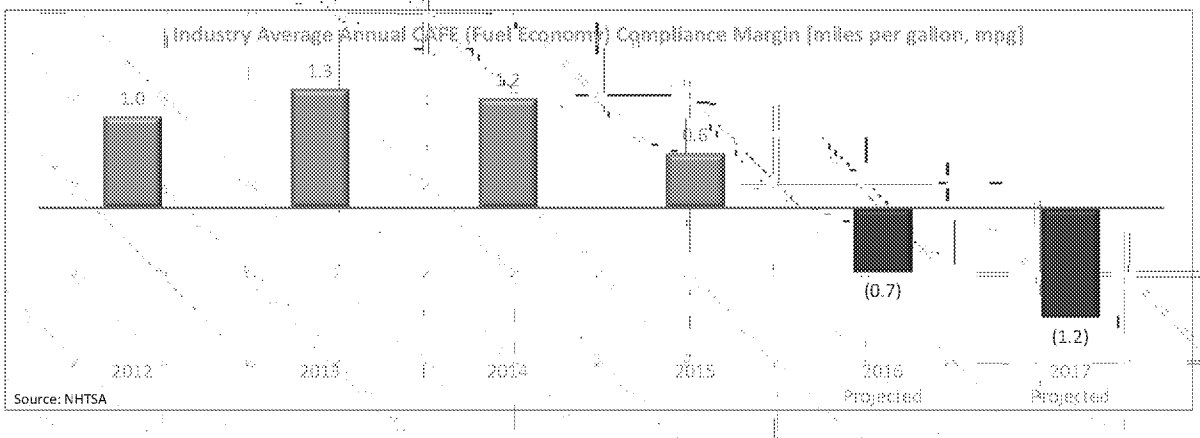
Mar '17

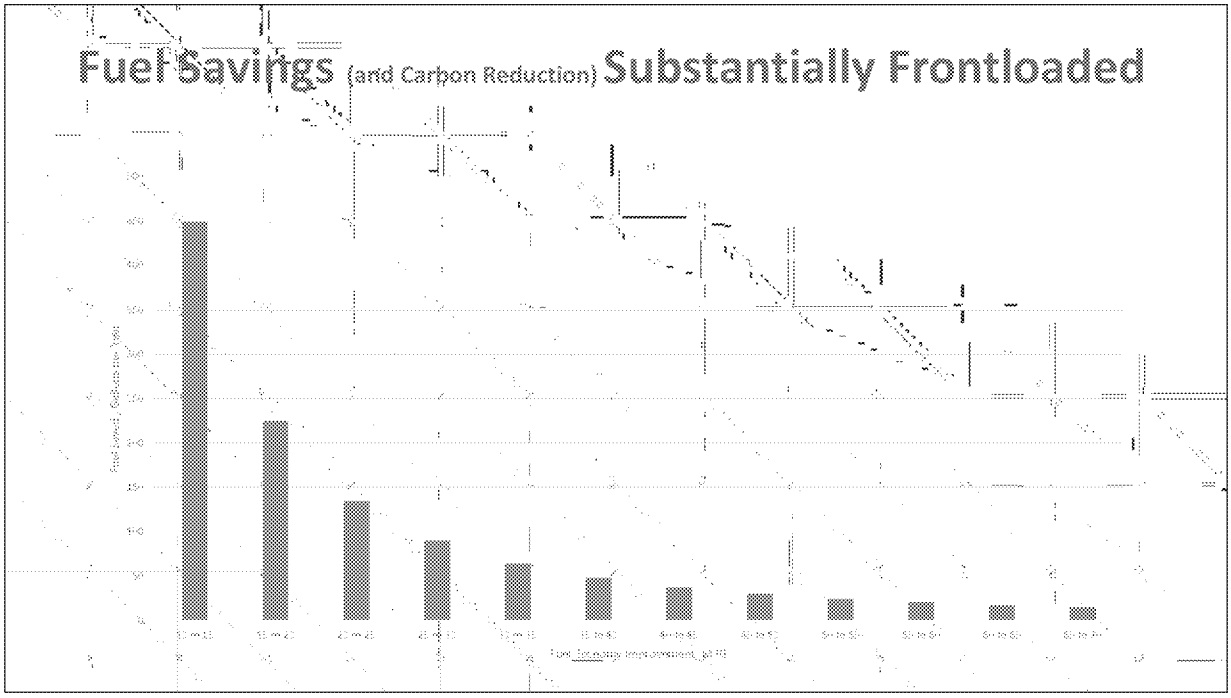
Compliance Trend Contradicts Theory

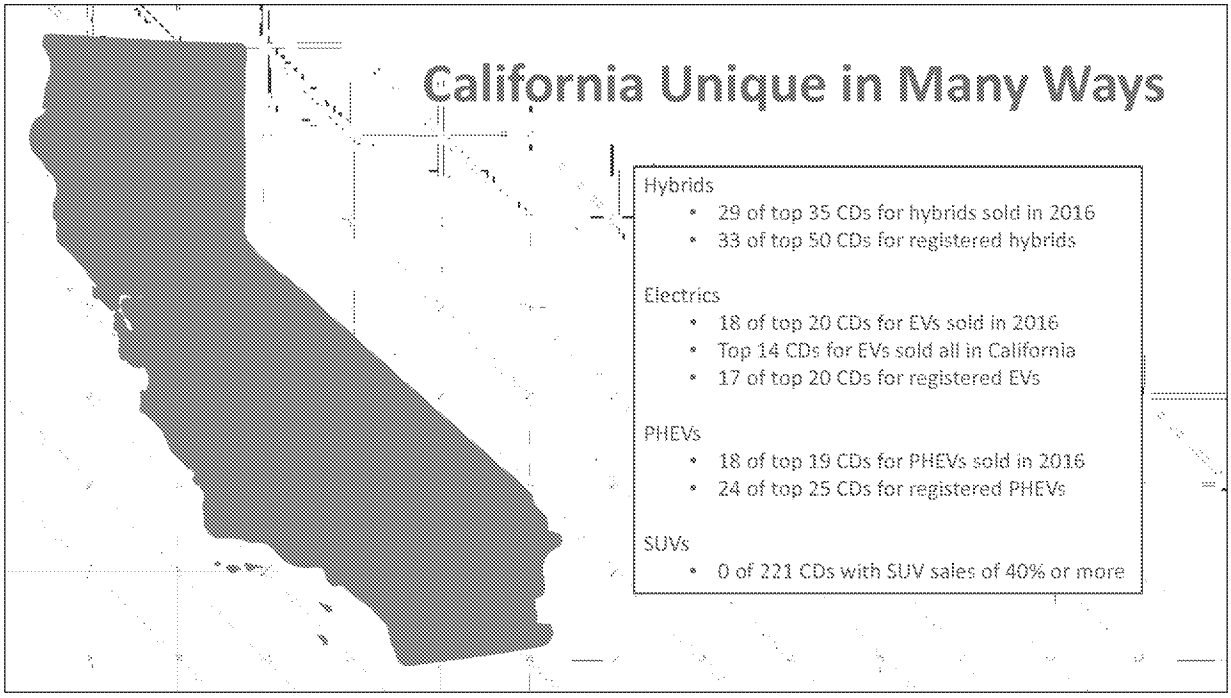


Source: NHTSA

Similar trends are observed for CAFE (fuel economy) compliance

- Between 2012 and 2014, manufacturers averaged 1.0 to 1.3 miles per gallon (mpg) better fuel economy than their standards
- In 2015, this compliance margin dropped in half to 0.6 mpg
- NHTSA projects that manufacturers on average will fail to meet the CAFE standards in 2016 and 2017


Fuel Savings (and Carbon Reduction) Substantially Frontloaded



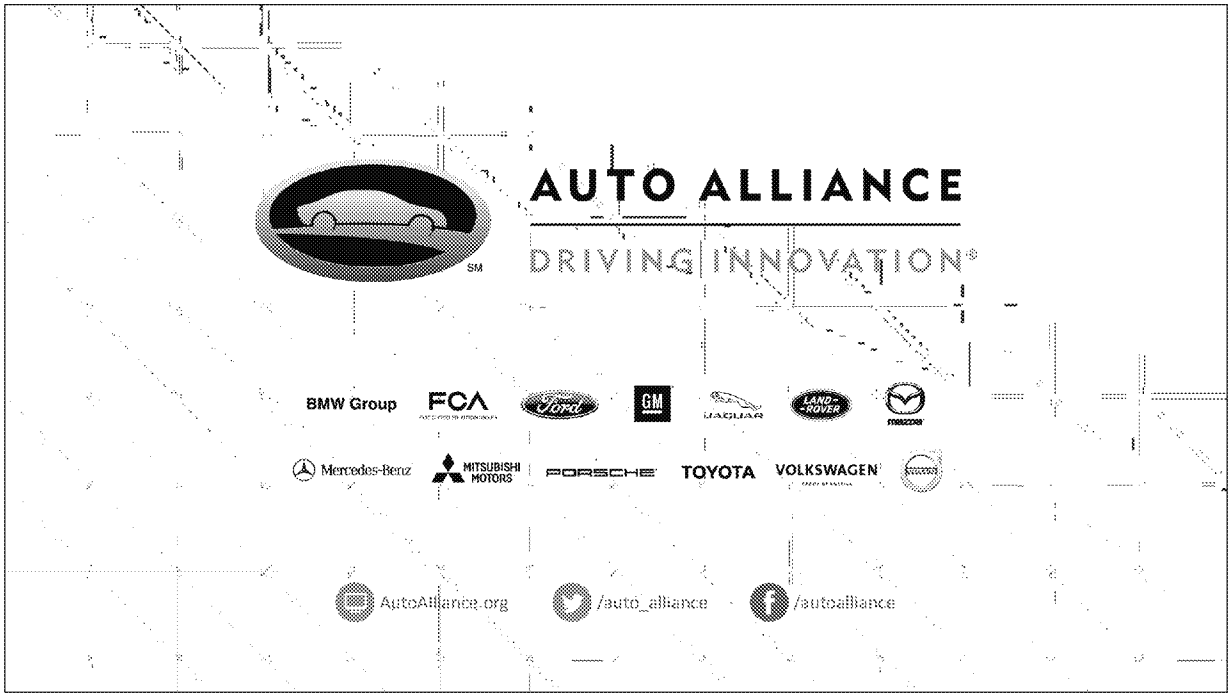
California Unique in Many Ways

Hybrids
- 29 of top 35 CDs for hybrids sold in 2016
- 33 of top 50 CDs for registered hybrids

Electrics
- 18 of top 20 CDs for EVs sold in 2016
- Top 14 CDs for EVs sold all in California
- 17 of top 20 CDs for registered EVs

PHEVs
- 18 of top 19 CDs for PHEVs sold in 2016
- 24 of top 25 CDs for registered PHEVs

SUVs
- 0 of 221 CDs with SUV sales of 40% or more


AUTO ALLIANCE
DRIVING INNOVATION
SM
BMW Group
FCA
Ford
GM
JAGUAR
LAND ROVER
Mercedes-Benz
MITSUBISHI MOTORS
PORSCHE
TOYOTA
VOLKSWAGEN
AutoAlliance.org
/auto_alliance
/autoalliance

Message

From: David Schwietert [DSchwietert@autoalliance.org]
Sent: 5/26/2017 10:38:03 PM
To: Dravis, Samantha [dravis.samantha@epa.gov]
Subject: Fwd: Alert: California Warns Senate Taking Step to Gut Auto Efficiency Rules

Fyi

Begin forwarded message:

From: Bloomberg Government <alerts@bgov.com>
Date: May 26, 2017 at 6:18:28 PM EDT
To: <dschwietert@AUTOALLIANCE.ORG>
Subject: Alert: California Warns Senate Taking Step to Gut Auto Efficiency Rules

Bloomberg GOVERNMENT

California Warns Senate Taking Step to Gut Auto Efficiency Rules

By John Lippert and Ryan Beene | May 26, 2017 06:18PM ET | Bloomberg Government

California Governor Jerry Brown criticized a U.S. Senate bill that aims to simplify auto efficiency standards, warning the measure represents a step toward decimating requirements that manufacturers produce cleaner cars.

Legislation introduced Thursday by Missouri Republican Roy Blunt would align the differing approaches that separate U.S. agencies take to regulating fuel mileage and carbon emissions. Sponsors include Michigan Democrat Debbie Stabenow.

California countered America's worst smog by writing its own clean-air rules starting in 1970 and has vowed to remain a bulwark against the deregulation President Donald Trump has promised the auto industry. Brown, a Democrat, said in an interview Friday that the Senate bill bolsters carmakers' efforts to avoid billions of dollars in penalties for failing to reach efficiency goals.

"It's of the nature of salami tactics," Brown said by phone. "They'll try to take a slice, and if they get away with it, they'll take another slice and another slice until they really gut the current regime to reduce greenhouse gases and improve fuel efficiency."

Read more: QuickTake Q&A on California's clean-car resistance to Trump

The National Highway Traffic Safety Administration regulates fuel economy of U.S. cars and trucks as a matter of energy independence. The Environmental Protection Agency, meanwhile, oversees the carbon emissions of vehicles to curb the effects of man-made climate change.

The agencies are reexamining their rules as part of a midterm review of standards set by former President Barack Obama that aim to boost the average fuel economy of each automaker's fleet to about 50.8 miles per gallon by 2025, up from 30.3 mpg this year. Trump reinstated the review in March, nullifying an EPA determination during the final days of the Obama administration that the requirements were feasible.

One Standard

Dissonance between the overlapping rules could result in heavy fines from NHTSA even if companies comply with the EPA's standards, the Alliance of Automobile Manufacturers said Thursday in a statement. Consumers ultimately wind up paying for the overlap through higher sticker prices, according to the alliance, whose members include General Motors Co., Toyota Motor Corp. and Volkswagen AG.

"This bill gets us closer to one national fuel economy standard program that meets the goals of both the NHTSA and EPA programs in a less costly, more efficient way," Blunt said Thursday in a statement on his website.

The Senate bill would enable automakers to earn more credits for introducing aerodynamic designs that reduce fuel consumption, or new technologies like air conditioners that release fewer or safer chemicals into the atmosphere. Carmakers also would have more time to accumulate such credits and apply them against emissions or fuel requirements for vehicles they're delivering to consumers.

Brown said he'll accept an invitation from EPA Administrator Scott Pruitt to discuss future fuel economy and emissions rules. He said he plans to tell Pruitt that climate change is an existential threat causing rising sea levels and forest fires.

"This measure of so-called harmonization is, more than anything else, perfume to cover the odorous maneuver on which they've now embarked," Brown said.

To contact the reporters on this story:
John Lippert in Chicago at jlippert@bloomberg.net;
Ryan Beene in Washington at rbeene@bloomberg.net

To contact the editors responsible for this story:
Craig Trudell at ctrudell1@bloomberg.net;
Jon Morgan at jmorgan97@bloomberg.net
Anne Riley Moffat

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Message

From: Dravis, Samantha [dravis.samantha@epa.gov]
Sent: 4/28/2017 12:41:09 AM
To: Michael.J.Catanzaro@who.eop.gov
Subject: Fwd: Auto Alliance follow up - Administrator Pruitt Meeting
Attachments: Auto Alliance Letter Administrator Pruitt April 27 2017.pdf; ATT00001.htm; Joint Alliance - Global Petition for Rulemaking June 2016.pdf; ATT00002.htm

Sent from my iPhone

Begin forwarded message:

From: "David Schwietert" <DSchwietert@autoalliance.org>
To: "Dravis, Samantha" <dravis.samantha@epa.gov>
Subject: FW: re: Auto Alliance follow up - Administrator Pruitt Meeting

My initial email had an error in your address

Dave

From: David Schwietert
Sent: Thursday, April 27, 2017 5:49 PM
To: bollen.brittany@epa.gov; 'dravis.samantha@epw.gov' <dravis.samantha@epw.gov>
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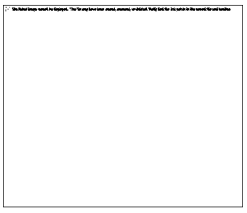
you through to underscore the changes that need to be made in keeping with the original 2010 and 2012 agreements that were advertised as "One National Program" for compliance purposes.

Thanks,

Dave

David Schwietert
Executive Vice President, Federal Government Relations & Public Policy
P: 202-326-5521 | dschwietert@autoalliance.org



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803 7th Street, NW
Suite 300
Washington, DC 20001
Main Phone: 202-326-5500
Main Fax: 202-326-5567

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803 7th Street N.W., Suite 300 | Washington, DC 20001
202.326.5500 | www.autoalliance.org
MITCH BAINWOL *President & CEO*

April 27, 2017

The Honorable E. Scott Pruitt
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Dear Administrator Pruitt:

On behalf of the Alliance of Automobile Manufacturers, Inc. ("Alliance"), I would like to thank you for helping to initiate two recent efforts that impact our industry:

1) EPA's reconsideration of the Final Determination on greenhouse gas standards for light-duty vehicles that was rushed through by the last Administration and;

2) Seeking public input on finding opportunities to streamline the complex array of existing regulations that could be repealed, replaced or modified to make them less burdensome.

The Alliance pledges to work with you on the two above actions and the attached harmonization petition as part of our industry's commitment to improve fuel economy and reduce emissions in a responsible and sustainable manner.

As mentioned in our letter to you dated February 21, 2017, the EPA's premature Final Determination improperly accelerated the single most important decision made by the EPA in recent history. By reconsidering the Final Determination, the EPA has exercised its authority to return to the promised Midterm Evaluation ("MTE") process. The MTE is a key component of the One National Program ("ONP") for fuel economy and greenhouse gas ("GHG") regulations in order to determine the appropriateness of Model Year ("MY") 2022-2025 standards. As your Notice of Intent explained, EPA is required under its own regulations to cooperate and interact with the National Highway Traffic Safety Administration ("NHTSA") during the MTE. Reconsideration of the Final Determination allows EPA to closely engage with NHTSA and to return to a well-reasoned process concerning MY 2022-2025 standards that fully accounts for market conditions, technology advancements, "real world" constraints, economic and employment impacts, previously dismissed or misunderstood stakeholder input, and recent compliance trends.

The Alliance appreciates EPA's commitment to revisit the existing record and consider new and more current data to ensure that "technological and economic concerns raised by the regulated community" are adequately considered and will be addressed moving forward. We look forward to working with you and your team on an informed revised Final Determination for the MY 2022-2025 standards that ensures auto manufacturers can meet the targets in a sustainable manner that does not sacrifice consumer choice, affordability, safety, employment, or fleet turnover. (Fleet turnover is a key indicator of a successful program because it demonstrates that consumers are finding that new and more technologically advanced vehicles are affordable which ensures the safest, cleanest, and most efficient new vehicles are on the road.)

The Alliance plans on working with NHTSA and EPA on the 2022-2025 MY Corporate Average Fuel Economy ("CAFE") and GHG standards and in addressing outstanding harmonization issues between the existing programs (attached). It is important to note that the Energy Policy and Conservation Act (EPCA) uniquely requires NHTSA to consider several key factors as part of its separate rulemaking. These factors include technological feasibility, economic practicability, and the effect of CAFE standards on motor vehicle safety.[1] As such, NHTSA is best suited to take a leadership role in both resolving harmonization issues and in determining final 2022-2025 standards.

The Alliance also looks forward to participating in EPA's implementation of Executive Order 13777: Enforcing the Regulatory Reform Agenda. We plan to both submit comments and work with the EPA's Regulatory Reform Task Force to identify specific rules that can be repealed, replaced, or modified while not affecting the continued advancements in fuel economy and emissions reductions. While an on-going iterative process is most likely necessary to identify regulatory opportunity, the major mobile source needs of the automotive industry can be broken down into three categories: revision and elimination of duplicative and unnecessary requirements, streamlining of certification and approval processes, and ensuring all vehicles and fuels are subject to performance-based metrics.

Duplicative and unnecessary requirements add time and complexity to the development and sale of new vehicles. Multiple vehicle regulatory programs at the Federal and State levels[2] require separate and duplicative reporting, accounting, and testing. For example, EPA and California have adopted nearly identical procedures for testing and reporting. The EPA should work with California and related stakeholders to either eliminate these duplicative procedures or apply broad "deemed to comply" provisions.

Streamlining the certification and approval processes is also important to industry. Highly concerning is the increased uncertainty and delays to the certification process caused by recently added undefined portable emissions measurement testing, unclear interpretation of auxiliary emissions control devices, and inconsistent approvals of GHG off-cycle credit requests. More certainty is needed for an already highly regulated industry. Regulatory interpretation is at the root of many of the certification challenges that the industry is facing and could be addressed either via guidance or through regulatory modifications.

While we encourage streamlining of the certification process, we are concerned over recent news surrounding the Administration's proposed budget cuts for the agency and the possible negative implications for vehicle certification. Although streamlining may assist the Administration to achieve some of the proposed budgetary goals, the Alliance would like to point out that EPA staff engaged in vehicle certification are critical to our industry and the economy. In addition, fees are currently structured to cover certification and compliance costs. We would be happy to follow up regarding the current fees that manufacturers already provide for critical EPA operations.

Lastly, equal treatment across all fuels and vehicle technologies is another key factor in ensuring a level playing field among automotive competitors. Automobile manufacturers should

---

1 Energy Policy and Conservation Act, as amended, 49 U.S.C. § 32902(f).

2 EPA GHG, California Air Resources Board ("CARB") GHG, NHTSA CAFE, Section 177 State GHG programs, CARB Zero Emissions Vehicle Program ("ZEV"), Federal On-Board Diagnostics ("OBD"), CARB OBD, Section 177 State ZEV and LEV programs, EPA Tier 3, and ARB LEV 3.

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not be held responsible for emissions associated with the production of electricity ("upstream emissions") as has always appropriately been the case for petroleum products. This includes both upstream fuel accounting and test procedures. As described in past Alliance comments, manufacturers should not carry the burden of addressing emissions from the production of fuels by other regulated entities that are completely independent of automotive manufacturers. Fuels should not be discredited or penalized at the tailpipe, but rather what is measured should be reported. Furthermore, diesel-fueled vehicles should be allowed the same durability procedures as similar advanced gasoline technology vehicles.

Once again, thank you for the opportunity to share our ideas. The Alliance and its members are highly interested in both regulatory reform and fuel economy standards. We intend to participate in upcoming regulatory reform stakeholder events and follow up with you and your staff on additional suggestions and specifics. We look forward to working with you to further reduce emissions and alleviate unnecessary regulatory burdens while improving fuel economy in a sustainable manner.

Sincerely,

Mitch Bainwol

Attachment: Letter from Mitch Bainwol and John Bozzella to Administrator McCarthy and Administrator Rosekind Re: Petition for Direct Final Rule with Regard to Various Aspects of the Corporate Average Fuel Economy Program and Greenhouse Gas Program.

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AUTO ALLIANCE
DRIVING INNOVATION

GlobalAutomakers

Mark Rosekind, PhD
Administrator
National Highway Traffic Safety Administration
1200 New Jersey Avenue, S.E.
Washington DC 20590

June 20, 2016

Gina McCarthy
Administrator
Environmental Protection Agency
Office of the Administrator 1101A
1200 Pennsylvania Avenue, N.W.
Washington DC 20460

Re: Petition for Direct Final Rule with Regard to Various Aspects of the Corporate Average Fuel Economy Program and the Greenhouse Gas Program

Dear Administrators Rosekind and McCarthy:

This is a petition for a Direct Final Rule pursuant to 49 CFR § 553.14 and 5 U.S.C. § 553(e) requesting that the National Highway Traffic Safety Administration (NHTSA) and the U. S. Environmental Protection Agency (EPA) exercise their authority[1] to address various inconsistencies between the Corporate Average Fuel Economy (CAFE) regulatory program and the light-duty vehicle greenhouse gas (GHG) emissions regulations and to address additional inefficiencies in the programs.

The Petitioners, the Alliance of Automobile Manufacturers and the Association of Global Automakers (jointly known as the trade associations), are trade associations representing manufacturers of automobiles, as defined by the Energy Policy and Conservation Act (EPCA), 49 U.S.C. § 32901, et. seq..[2] The Petitioners submit this petition on behalf of their member companies.

[1] 49 USC § 32901 et. seq.

[2] The Alliance of Automobile Manufacturers is an association of 12 vehicle manufacturers which account for roughly 77% of all car and light truck sales in the United States. These members are BMW Group, FCA US LLC, Ford Motor Company, General Motors, Jaguar Land Rover, Mazda, Mercedes-Benz USA, Mitsubishi Motors, Porsche Cars North America, Toyota, Volkswagen Group of America, and Volvo Car USA.

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The actions requested are appropriate as a Direct Final Rule because they are essentially technical amendments relating to inconsistencies, errors, or procedural issues with respect to the CAFE and GHG programs. They do not impact the stringency of the standards as originally intended, nor are they contrary to the underlying analyses upon which the standards were based. The Petitioners seek expeditious action on the requested changes in order to address pending issues affecting many of our members, and to provide certainty in compliance planning.

On May 21, 2010, President Obama issued an Executive Order directing NHTSA and EPA to develop a "coordinated national program" of "joint Federal standards" to improve automobile fuel efficiency and reduce GHG emissions from light-duty vehicles. The National Program was premised on harmonization between the two programs. Many trade association member companies entered into Commitment Agreements with NHTSA and EPA through which they committed to abide by a harmonized set of CAFE and GHG standards for Model Years 2012-2025.[3]

The specific regulatory changes that the trade associations request are set forth in detail in this petition, along with supporting material demonstrating that the proposed changes are aligned with widely accepted policy goals, are technically sound, and are consistent with the relevant statutes. Some of the requested changes relate to aspects of the CAFE rules that result in a greater level of stringency than the GHG program. The CAFE standards are required to be set at a level that is technologically and economically feasible without the need to pay CAFE fines. To the extent that discrepancies and correctable inefficiencies in the program could force manufacturers to pay CAFE fines despite being able to meet the GHG standards, the CAFE standards are beyond what should be considered "maximum feasible." This petition does not address the feasibility of the augural CAFE standards for MYs 2022-2025, and making the changes requested here would not have a material impact on the feasibility of those standards. Rather, these changes are necessary to bring the overall CAFE program into better alignment with the "maximum feasible" level of fuel economy for MYs 2010-2021.

The National Program is Premised on Harmonization

From the beginning, the National Program was intended to result in a joint rule to set standards for both the GHG and CAFE programs that would allow automakers to comply with both programs through a single unified fleet. As noted by the agencies when announcing the MY 2017-2025 standards: "the goal . . . is to establish harmonized federal standards such that automobile manufacturers will be able to build a single light-duty national fleet that satisfies all

[3] The Commitments from the Petitioners and from EPA and NHTSA were set forth in letters dated May, 2009 (with regard to the MY 2012-2016 standards), May, 2010 (with regard to continuing the process), and July, 2011 (with regard to the MY 2017-2025 standards).

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federal and state requirements, while enabling consumers to still have a full range of vehicle choices."[4]

The National Program has been operational since MY 2012, and both manufacturers and the agencies have now had the benefit of experiencing how the elements of the programs and the market have impacted the ability of manufacturers to comply with both programs through a single fleet and technology array.[5] With the perspective of hindsight, it is clear that certain discrepancies between the two programs have prevented the level of harmonization sought and anticipated. Some manufacturers are projecting that, despite being able to comply with the numerically more stringent GHG standards, they are likely to be in a position to pay CAFE fines. This was not the intent of the National Program.

Petitioners' member companies anticipate that some of these impediments, which are apparent already for purposes of the MY 2012-2016 standards, will continue to be impediments for MYs 2017-2025.

The Petitioners acknowledges that EPCA contains certain constraints preventing full harmonization between the two programs. This petition does not request that the agencies attempt to harmonize the CAFE and GHG programs in a manner that contravenes statutory directives. Certain aspects of the programs will require legislative change to ensure consistency, and include the following:

> EPCA limits the maximum increase in any compliance category attributable to transferred credits. *See* 49 U.S.C. § 32903(g)(3). The GHG program includes no such limitation, and therefore offers a more significant incentive to deploy advance technologies early in order to cover unexpected market fluctuations, product planning assumptions that prove inaccurate, product changeover plans, or to provide credits to the market.
>
> EPCA limits the number of years an earned credit may be applied to a manufacturer's compliance calculation. EPCA allows credits to be used for five model years forward and for three model years back. EPA has harmonized with this constraint, but further allowed a one-time carry forward to allow credits earned in MYs 2010-2016 to be used through

[4] During the initial implementation of the National Program, the agencies noted in the 2010 rule that "NHTSA and EPA's standards would require *slightly different* fuel efficiency improvements." 75 Fed. Reg. 25324, 25342 (May 7, 2010) (emphasis added). The agencies did not expect significantly different fuel efficiency improvements in order to meet the CAFE standards in addition to the GHG standards.

[5] As described in more detail below, some aspects of the program have been applied to MYs prior to 2012. Where appropriate, the agencies should adopt the changes in the CAFE program beginning with the same model year that they became operative in the GHG program.

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MY 2021. Due to the statutory limitation, that same consideration cannot be accorded within the CAFE program.[6]

The agencies, however, have the ability to address a number of other inconsistencies without jeopardizing the fuel consumption benefits associated with the standards. In particular, and for the reasons set forth below, petitioners request that the agencies harmonize the programs as follows:

The Petitioners request that EPA and NHTSA calculate the fuel economy for a manufacturer's fleets for MYs 2010-2016 taking into account off-cycle technologies at the same levels and in the same way as EPA accounts for those technologies in the GHG program. Doing so would not erode the overall benefits of the CAFE standards or the National Program. The Petitioners recognize that EPA, in conjunction with NHTSA, has taken into account such off-cycle technologies in calculating compliance with the MYs 2017-2025 standards. Similar treatment would be just as appropriate with regard to the earlier model years consistent with EPA's recognition of off-cycle technology beginning in 2010.

The Petitioners request that EPA and NHTSA calculate the fuel economy for a manufacturer's fleets for MYs 2010-2016 taking into account air conditioning efficiencies at the same levels and the same ways as EPA is accounting for those efficiencies in the GHG program. Below we provide an approach that would grant such credits while also accounting for the differences in the stringency of the GHG and CAFE standards that was based on originally not having included these credits in the CAFE standards.

The Petitioners request that NHTSA apply the adjustment factor, beginning in Model Year 2011, when credits are carried forward or carried back within a compliance category, as well as when they are traded and transferred. The adjustment factor in 49 C.F.R. Part 536 was established by NHTSA in response to the Congressional mandate to ensure, when creating a program for trading credits between manufacturers, that overall oil savings remains the same. EPA has a different approach to ensuring the consistency of the benefits in the GHG program. The change being requested in this petition would help to harmonize the two approaches since the adjustment factor equates the CAFE credit to a linear function similar to the way in which credits are applied in the GHG program.

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[6] EPA has made additional allowances to harmonize the GHG program with the CAFE program despite an absence of statutory constraints. For example, EPCA specifies certain values for dual-fueled vehicles, which values EPA has adopted through MY 2015. Additionally, for purposes of establishing CAFE standards, EPCA assumes that fuel economy will be measured only with regard to fuel consumption during vehicle travel. The CO_2 program also accounts for emissions reductions that are not associated with the fuel economy cycle testing. EPA and NHTSA have resolved this discrepancy by recognizing that EPA has the authority to determine how to calculate fuel economy, an authority which allows EPA to take such "off-cycle" improvements into account and provide appropriate incentive in both programs for the substantial benefits represented by such technologies.

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The Petitioners request that NHTSA reconsider its decision not to harmonize with EPA by using the same, fixed Lifetime Vehicle Miles Traveled (VMT) values in the adjustment factor for MYs 2011-2016. NHTSA's VMTs for MYs 2011-2016 are generally lower than those derived from the 2009 National Household Travel Survey, even without the VMT growth rate assumed by the agencies, with the result that the adjustment factor is artificially low. As noted in the rulemaking analyses, while EPA's approach is similar to NHTSA's approach, it provides for better year-over-year consistency and accounts for the external factors that impact the VMT calculation. Since the fixed VMT value being employed incorporates an average which includes the earlier model years, applying it to those model years is analytically consistent.

Petitioners request NHTSA revise the definition of the term "transfer" in 40 CFR 536.3 to be consistent with language in the 2010 preamble of the proposed rulemaking for 2017-2025 GHG/CAFE standards. This revision would more closely align the NHTSA credit transfer program with that of the EPA GHG provisions as was the expressed intent in the 2010 preamble language.

In addition to the above, the Petitioners request that the agencies allow manufacturers to manage their credit supply and use. We note that, while the manufacturer model year reports[7] track certain credits separately, such as the off-cycle credits, and appear to allow manufacturers the ability to apply either those credits or over-compliance credits as they choose, in a recent publication EPA stated instead that technology credits must be applied before any over-compliance credits are applied.[8] The Petitioners request that, rather than imposing a priority system on the application of credits, the agencies allow manufacturers to choose how to apply their available credits.

The Petitioners also request that each agency take the following actions. While not giving rise to direct conflicts between the programs, the following issues involve potential difficulties that could lead to compliance disparities and/or that are inconsistent with the original intent of the programs.

The Petitioners request that NHTSA adjust the minimum domestic passenger car standard for MYs 2012-2016 to reflect 92% of the required average passenger car standard taking into account the fleet mix as it occurred, rather than what was forecast. Doing so better aligns the overall CAFE performance values with real world results and EPA's calculations, and is fully consistent with the statute.

The Petitioners request that EPA and NHTSA provide for a default acceptance of petitions for off-cycle credits, provided that all required information has been provided. Limited agency resources have delayed the processing of these petitions, and the delay

[7] See 40 CFR 600.512-12

[8] Environmental Protection Agency. "Greenhouse Gas Emissions Standards for Light-Duty Vehicles – Manufacturers Performance Report for the 2014 Model Year" (EPA-420-R-15-026). December 2015. (P. 17)

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impedes manufacturers' ability to plan for compliance or make investment decisions. Streamlining the process will further promote a more efficient and better harmonized National Program.

The Petitioners request that EPA remedy the equation applied to calculate the multiplier credits available in the GHG program. As the agency is aware, the calculation that is currently in the regulatory text does not reflect the intent, with the result that manufacturers earn fewer multiplier credits than was originally intended. This important flexibility was intended to encourage the ongoing production of zero emission vehicles, and achieving the full flexibility is particularly important in an environment of lower gasoline prices. Although not directly related to harmonization, the Petitioners believe that it would be appropriate for EPA to additionally address this error when processing this petition.

The above items are appropriate for the agencies to handle through a Direct Final Rule. The requested modifications would change neither the stringency levels of the standards themselves nor the overall benefits achieved through the National Program. The modifications requested in this petition are therefore suited to a Direct Final Rule. While there may be other opportunities for EPA and NHTSA to enhance harmonization between their two programs, the items discussed in this Petition represent a meaningful step in the right direction.

Specific Requests

This section sets forth the specific requests for modifications to the regulations, along with the supporting rationale for each request.

1. Include Off-Cycle Credits in the CAFE Calculation for MYs 2010-2016

The agencies should take appropriate steps to calculate corporate average fuel economy for MYs 2010-2016 more consistently with how corporate average fuel economy is to be calculated for MYs 2017-2025 by including in the CAFE compliance calculation the same off-cycle credits applied in the GHG program for earlier model years. Significantly, EPA acknowledged off-cycle credits beginning with MY 2010.

In 2012, EPA and NHTSA finalized action to acknowledge off-cycle credits equally in the CAFE program through EPA's authority to calculate a manufacturer's fuel economy performance. NHTSA, however, resisted applying those credits to earlier model years as EPA had done.

NHTSA's decision not to do so was premised on an erroneous assumption that NHTSA had fully accounted for the benefits of those technologies in the later model years, while it had not done so for earlier model years. In fact, however, neither EPA nor NHTSA took those benefits into account (instead creating a pure incentive) and, therefore, the agencies can maintain

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consistency by providing the credits in both programs for all model years, starting with MY 2010.

Significantly, the GHG standards -- like the corresponding CAFE standards -- did not include any quantification of the impacts of the off-cycle credits approved for use during MYs 2012-2016. 75 Fed. Reg. at 25438 ("Because these technologies are not nearly so well developed and understood, EPA is not prepared to consider them in assessing the stringency of the CO_2 standards").[9] Similarly, the agencies did not consider the benefits of off-cycle technologies in setting the standards for MYs 2017-2025, other than the 2-cycle benefits of stop-start and active aerodynamics.[10]

NHTSA nevertheless declined to apply the same off-cycle credits to earlier model years as EPA had done, noting only that "NHTSA did not take such credits into account when adopting the CAFE standards for those model years. As such extending the credit program to the CAFE program for those model years would not be appropriate." 77 Fed. Reg. at 62840. That statement, however, appears inconsistent with the considerations of off-cycle credits as more specifically described within the rulemaking analyses. Indeed, in addition to the fact that neither EPA nor NHTSA accounted for those benefits – other than the 2-cycle benefits of stop-start and active aerodynamics in the MY 2017-2025 rule -- NHTSA's analysis of "maximum feasibility" in the 2010 preamble makes clear that the agency did in fact consider all relevant technologies, and did so in a way that the agency announced were "consistent standards among all components of the National Program." 75 Fed. Reg. at 25607. [11]

The Petitioners request that the agencies reconsider calculating fuel economy for the earlier model years, and applying the same off-cycle credits offered in the GHG program in the CAFE program as well.

Recommendation: Section 600.510-12 Calculation of average fuel economy and average carbon-related exhaust emissions. Subsection (c)(1):

Change From:

(i) Except as allowed in paragraph (d) of this section, the average fuel economy for the model years before 2017 will be calculated individually for each category identified

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[9] Consistent with the fact that neither EPA nor NHTSA included off-cycle credits in their stringency analyses, NHTSA did not adjust its standards to account for off-cycle credits when EPA adopted them. The result is that, while the stringency of the standards is nominally the same as it regards off-cycle technology (other than air conditioning), EPA provided a full incentive for the introduction of innovative and novel technologies during the MY 2012-2016 timeframe, while NHTSA did not.

[10] The agencies noted that "the ability to generate off-cycle credits and increases in fuel economy for use in compliance will not affect or change the stringency of the GHG or CAFE standards established by each agency."

[11] Although EPCA does not require that CAFE standards meet a cost/benefit analysis, the agency noted that it is permitted to conduct one. See, e.g., 75 Fed. Reg. at 25553 and Center for Biological Diversity v. NHTSA, 508 F.3d 508 (9th Cir. 2007) The substantial benefits of the CAFE standards, which overlap with the benefits of the overall National Program, illustrate that the CAFE program, as modified, would continue to provide substantial societal benefits far beyond the societal costs. There would be no erosion of the beneficial impact of the CAFE standards.

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in paragraph (a)(1) of this according to the provisions of paragraph (c)(2) of this section.

(ii) Except as permitted in paragraph (d) of this section, the average fuel economy for the 2017 and later model years will be calculated individually for each category identified in paragraph (a)(1) of this section using the following equation:

Average MPG = 1/[1/MPG-(FCIVac + FCIVoc + FCIVpu)]

Change to:

(i) Except as permitted in paragraph (d) of this section, the average fuel economy for the 2010 through 2016 model years will be calculated individually for each category identified in paragraph (a)(1) of this section using the following equation:

Average MPG = 1/[1/MPG-(FCIVoc)]

(ii) Except as permitted in paragraph (d) of this section, the average fuel economy for the 2017 and later model years will be calculated individually for each category identified in paragraph (a)(1) of this section using the following equation:

Average MPG = 1/[1/MPG-(FCIVac + FCIVoc + FCIVpu)]

2. *Include Air-Conditioning Efficiency Credits in the CAFE Calculation for MYs 2010-2016*

For similar reasons, the agencies should also permit the use of air conditioning efficiency credits in MYs 2010-2016 consistent with the agencies' approach to MYs 2017-2025. In the rule for the earlier years, the agencies accounted for the difference of including these credits in one program but not the other by adjusting the overall stringency of the standards for MYs 2012-2016. While the GHG standards amounted to an overall targeted level of 35.5 mpg, the CAFE standards amounted to an overall combined fleet target level of 34.1 mpg in 2016. The Petitioners propose an approach that provides full harmonization by allowing such credits for MYs 2010-2016 while also taking into account the difference in the levels of the standard.

The disparity between the standards creates a situation in which a manufacturer that includes more efficient air-conditioning systems than those assumed by EPA for the industry as a whole is penalized in the CAFE program by not receiving the same consideration provided in the GHG program. The below graph illustrates the substantial, and unnecessary distinction, between the two programs due to this disparity:

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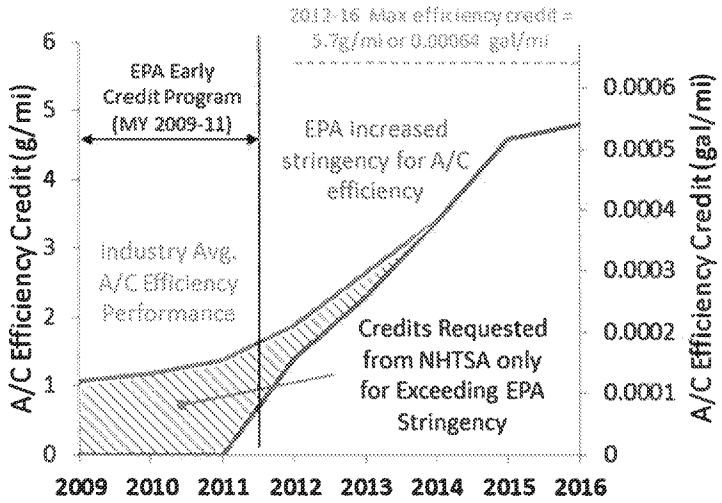

The blue line represents the amount of air-conditioner efficiency credits EPA projected for the fleet, including the stringency beyond the CAFE standards. The red line shows how the industry performed on average. The shaded area between the two shows the credits disregarded in the CAFE program, already accounting for the difference in the stringency of the standards.

In developing the program, EPA assumed a maximum benefit of 5.7 g/mi due to air conditioning efficiency credits. The chart below shows the projected penetration rate and the total CO_2 credit in the EPA program based on that penetration rate. The Petitioners suggest that the agencies apply a formula ($FCIV_{ACPROJ}$) to adjust that credit to account for the difference in stringency between the programs.

For example, if a manufacturer deployed MAC efficiency technology worth 3.1 g CO_2/mile across its MY 2013 fleet, the full credit for CAFE would have been a FCIV of 0.00035 (3.1/8887). However, since the stringency would also have been increased in MY 2013 by a FCIV of 0.00026, the net effect would be 0.00009 gallons/mile.

Model Year	2009-11	2012	2013	2014	2015	2016
Projected Penetration Rate	N/A	28%	40%	60%	80%	85%
CO_2 Credit (5.7 g/mi x Penetration Rate)	0	1.6	2.3	3.4	4.6	4.8
$FCIV_{AC\ PROJ}$ (gallons/mile, CO_2 credit/8887)	0	.00018	.00026	.00038	.00052	.00054

As with the off-cycle credits, the agencies can harmonize the programs while maintaining the same levels of overall stringency and remaining consistent with the analyses previously set

forth. With the benefit of hindsight, it has become clear that the program disparities are unnecessarily undermining the intent of the National Program.

Recommendation: Section 600.510-12 Calculation of average fuel economy and average carbon-related exhaust emissions. Subsection (c)(1):

Change From:

(i) Except as allowed in paragraph (d) of this section, the average fuel economy for the model years before 2017 will be calculated individually for each category identified in paragraph (a)(1) of this according to the provisions of paragraph (c)(2) of this section.

Change to:

(i) Except as permitted in paragraph (d) of this section, the average fuel economy for the 2010 through 2016 model years will be calculated individually for each category identified in paragraph (a)(1) of this section using the following equation:

Average MPG = 1/[1/MPG-(FCIVoc)-max(0,(FCIVac –FCIVac proj))]

Where FCIVac proj is from the table above. FCIVoc is for off-cycle credits discussed above.

3. Apply the Fuel Savings Adjustment Factor Across Model Years

The Petitioners request that NHTSA modify the fuel savings adjustment factor by making it applicable when credits are carried forward or carried back within the same fleet. When Congress authorized a credit trading program between manufacturers, it also mandated that NHTSA ensure that total oil savings be preserved. *See* 49 U.S.C. § 32903(f)(1). Congress did not include the same provision in the provision mandating a credit transfer program between the fleets, but NHTSA decided that such a provision was appropriate. *See* 49 U.S.C. § 32903(g); 74 Fed. Reg. 14,452 (March 30, 2009). As a result, the adjustment factor established in Part 536 applies to both.

It has long been recognized that fuel savings is not linear with fuel consumption. The amount of fuel consumed by exceeding a standard by 1 mpg will vary based on the level of the standard. Although carry forward/carry back credits were used for many years, for much of that time – during the years of the Congressional CAFE freeze – the standards did not change and therefore credits were associated with the same amount of fuel savings from year to year. When developing the credit trading and credit transfer programs, and establishing the adjustment factor, consideration was not given to also applying the adjustment factor between model years within the same compliance fleet. The theory, however, remains the same and the adjustment factor would ensure that total oil savings are achieved regardless of when and where the credits are used. We recognize there may be some accounting challenges associated with implementation of

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this concept. We look forward to working with you to consider and develop an appropriate process to consider and account for these situations.

Recommendation: Section 536.4 Credits. Subsection (c):

Change From:

(c) Adjustment factor. When traded or transferred and used, fuel economy credits are adjusted to ensure fuel oil savings is preserved. For traded credits, the user (or buyer) must multiply the calculated adjustment factor by the number of its shortfall credits it plans to offset in order to determine the number of equivalent credits to acquire from the earner (or seller). For transferred credits, the user of credits must multiply the calculated adjustment factor by the number of its shortfall credits it plans to offset in order to determine the number of equivalent credits to transfer from the compliance category holding the available credits. The adjustment factor is calculated according to the following formula:

Change to:

(c) Adjustment factor. When traded or transferred and used, fuel economy credits are adjusted to ensure fuel oil savings is preserved. ***This adjustment factor also applies to credits used within a manufacturer's same fleet, i.e. domestic car to domestic car.*** For traded credits,..."

4. Apply the Harmonized VMT Estimates from MYs 2017-2025 to MYs 2011-2016

The Petitioners request that NHTSA reconsider its position with regard to the estimate of Vehicle Miles Traveled (VMT) used in the adjustment factor. For MYs 2012-2016, the agency had estimated VMT separately by model year and, in 2012 added an additional estimate for MY 2011. For MYs 2017-2025, NHTSA proposed to align with EPA and used a fixed VMT value approach. In response to a comment from the Alliance, NHTSA decided against applying the same fixed values to the earlier model years, stating that "we do not believe that the benefits of harmonization in this particular aspect for these model years outweigh the potential fuel savings losses that may occur if a change is made at this time." 77 Fed. Reg. at 63130.

With the benefit of hindsight, it is clear that no fuel savings were, in fact, lost. Instead, because VMT for the earlier model years, as derived from the 2009 National Household Travel Survey, were generally higher than NHTSA's projections, the amount of fuel savings per credit was actually undervalued. NHTSA should, at the least, update the VMT estimates to the best VMT estimates to reflect better the real world fuel economy results.[12]

[12] Petitioners acknowledge that adjusting the VMT estimates would present further challenges to those companies which may have traditionally run at a CAFE deficit and for whom accommodations were made to assist in the transition from a CAFE program permitting the payment of civil fines in lieu of compliance to the GHG program where non-compliance is not an option. Petitioners suggest that if a company is entitled to participate in the

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Estimated VMT represents an analysis that takes into account various factors impacting the extent to which consumers use their vehicles. Considerations wholly external to motor vehicle manufacturers and motor vehicle regulators impact each year's VMT. To derive a reasonable estimate, EPA conducted its analyses and averaged the calculated, anticipated VMT for MYs 2012-2030. While micro- and macro-economic considerations may impact VMT year-by-year, the averaging approach provides a consistent and reasonable basis (as evidenced by the fact that both agencies have adopted it prospectively) to proceed.

In the Regulatory Impact Analysis for MYs 2017-2025, the agencies noted that NHTSA's approach to estimating VMT closely approximated EPA's approach for those model years. (*See* 2012 Regulatory Impact Analysis, pp. 4-118-119). EPA made adjustments to its VMT modeling "to improve consistency with the CAFE model and with the analysis used to collect the VMT and survival rate data." (RIA, p. 4-121). The RIA further indicates that EPA's approach "is consistent with the MYs 2012-2016 rule. . . . The use of a single growth factor ensures consistency with the AEO projections about future micro and macroeconomic trends and underlying assumptions about consumer responsiveness to those trends." (RIA, p. 4-119, n. www)

According to the agencies' Regulatory Impact Analysis, the EPA approach is both similar to the NHTSA approach and similar to the approach EPA used for the earlier rulemaking. The EPA model is considered a reasonable estimate of future VMT, taking into account the various economic factors that impact VMT. Any assumed loss of fuel savings, therefore, would appear to be a "paper loss" based solely on NHTSA's estimate, not an actual loss based on statistical analyses the agencies have jointly decided to use prospectively.

Harmonizing VMT estimates for all model years of the National Program is particularly important to maintain consistency in manufacturer's compliance planning in light of market conditions. Credit flexibilities – particularly those that align more fully with EPA – are critical to providing the needed support to ensure that a company can meet the requirements of both programs with the same fleet of vehicles. Since NHTSA's VMT estimates appear to have artificially diminished the value of each credit, and since EPA's VMT approach has been modified to align well with CAFE and has been adopted by both agencies as a valid methodology, the Petitioners request that NHTSA reconsider its position and apply the EPA VMT estimates to MYs 2011-2016.

Recommendation: Section 536.4 Credits. Subsection (c):

Change From:

VMTe = Lifetime vehicle miles traveled as provided in the following table for the model year and compliance category in which the credit was earned;

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transitional TLAAS program, and would be adversely impacted by the VMT adjustment, that company should be allowed a one-time option to retain the original VMT estimates.

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VMTu = Lifetime vehicle miles traveled as provided in the following table for the model year and compliance category in which the credit is used for compliance;

Change to:

VMTe= 195,264 for passenger cars and 225,865 for light duty trucks

VMTu= 195,264 for passenger cars and 225,865 for light duty trucks

5. *Revise NHTSA Credit Transfer Definition to be More Consistent with EPA*

The Petitioners request NHTSA revise the definition of the term "transfer" in 40 CFR 536.3 to be consistent with language in the 2010 preamble of the proposed rulemaking for 2017-2025 GHG/CAFE standards.

In the 2010 rulemaking, NHTSA made an effort to harmonize, to the extent allowable under the CAFE statute, its credit transfer program with EPA's GHG credit transfer approach. In the preamble to that rulemaking, NHTSA stated: "As a way to improve the transferring flexibility mechanism for manufacturers, NHTSA interprets EISA not to prohibit the banking of transferred credits for use in later model years." Thus, credits could be transferred from one fleet to another (subject to the statutory limitation in 49 USC 32903 (g)(3)), banked in the receiving fleet, and then the "credits could be carried forward or back without limit later if and when a shortfall ever occurred in that same fleet." 75 Fed. Reg. at 25666. Such a treatment of over-compliance credits is illustrated below:

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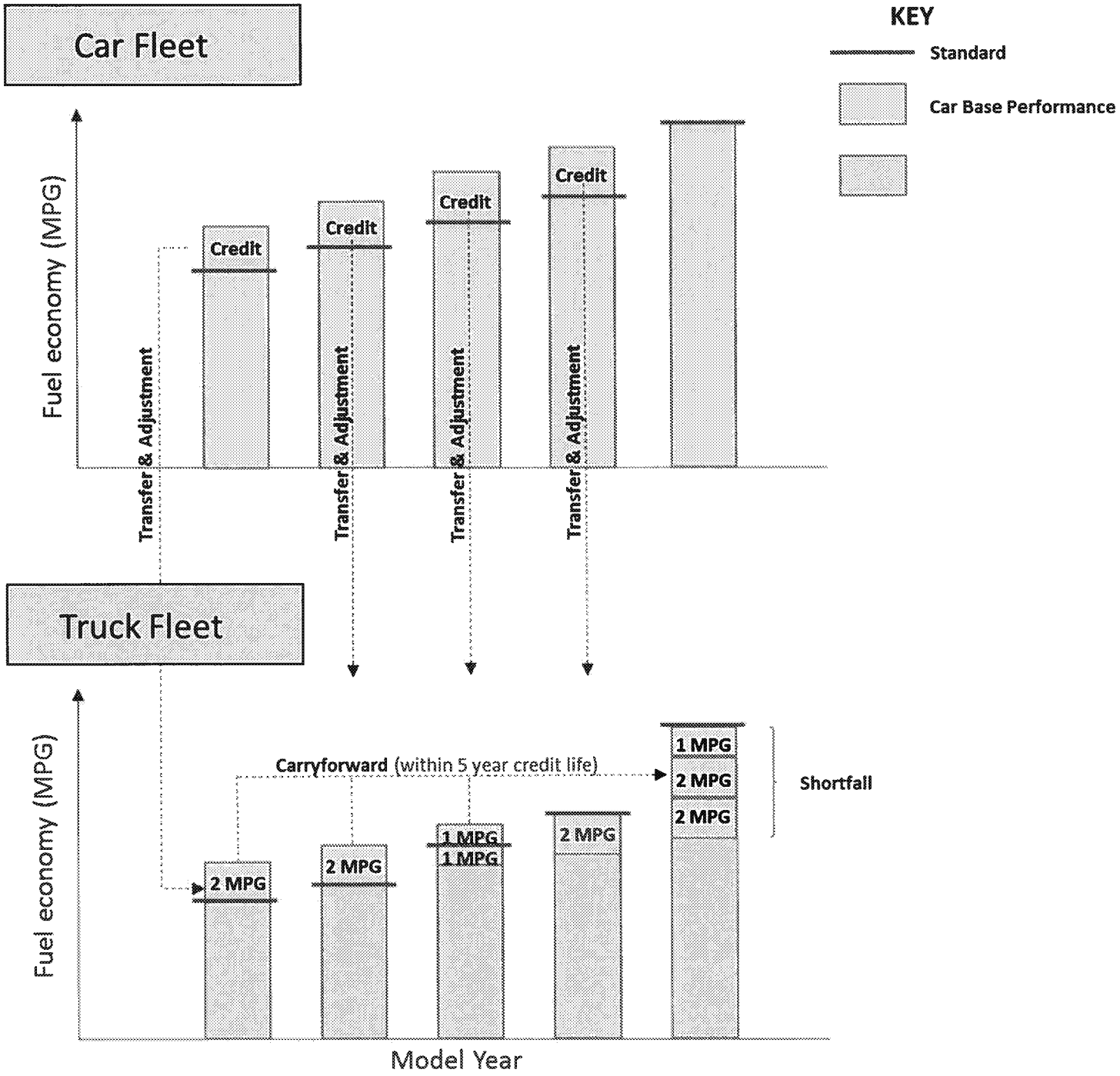

Note: Scenario showing 2 mpg credit transfer limit.

However, in a subsequent interpretation letter to a manufacturer, NHTSA moved away from the language in the preamble and stated that its intent was to apply the statutory limitation at the time the credits are used, as opposed to the time they were transferred and banked by a

manufacturer.[13] The result of this interpretation prohibits the banking and carryforward of credits illustrated in the figure above which is inconsistent with the preamble's stated intent "to harmonize better with EPA's CO2 program." This regulatory interpretation makes the NHTSA and EPA programs very different with regard to the flexibility to earn and use credits for over-compliance with required standards, since EPA allows unlimited transfer of GHG credits between a manufacturer's fleets. This disharmony creates unnecessary burdens and creates unnecessary complexity between the NHTSA and EPA programs.

Recommendation:

At the end of the existing definition of the term "Transfer" in 49 CFR 536.3, add the following:

> The limitation in 49 USC 32903(g)(3) shall apply at the time such credits are transferred. Once transferred, the credits are considered part of the receiving fleet and may be carried forward or back to the same extent that they could have before being transferred. The adjustment factor will be applied at the time credits are used to achieve compliance.

6. *Refrain From Imposing Unnecessary Restrictions on The Use of Credits*

Both the CAFE program and the GHG program were intended to allow manufacturers to earn credits and to utilize those credits as they deem appropriate to cover any shortfalls. Permitting the companies to manage their credits allows manufacturers to take into account future technology planning. This means that manufacturers with more credits than needed to cover an immediate shortfall should be able to choose which bank of credits to draw from to cover the shortfall and which to hold for future model years.

The Petitioners are concerned about the following language appearing in EPA's Manufacturer's Performance Report for the 2014 Model Year:

> Every manufacturer starts at the same place: by measuring the CO2 tailpipe emissions performance of their vehicles using EPA's City and Highway test procedures (referred to as the "2-cycle" tests). Then they may choose to apply a variety of optional technology-based credits to further reduce their fleet GHG emissions compliance value. The 2-cycle tailpipe CO2 value, when reduced by the net grams/mile equivalent of the optional credits, determines a manufacturer's model year performance and whether credits or deficits are generated by a manufacturer's model year fleet.

EPA-420-R-15-026 (Dec. 2015).

As stated, the language suggests that EPA will initially measure emissions based on the fuel economy testing, and then apply any technology credits (such as off-cycle and air conditioning credits) to determine a manufacturer's fleet performance. Once that performance has been calculated, EPA will determine whether there are over-compliance credits earned or

[13] See letter from O. Kevin Vincent to Toyota dated July 6, 2011.

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available under the GHG program and NHTSA will determine whether there are over-compliance credits available under the CAFE program.

The problem with this approach is that it denies manufacturers the ability to get the full benefit of past model year credits that they have earned under the GHG and CAFE programs. Under the credit banking provisions of both programs, manufacturers may earn credits by overachieving the standards in one model year, and apply those credits to offset shortfalls in a future model year. Under the agencies' prescriptive approach to credit management, technology credits earned in the current model year must be immediately applied toward any deficits in the current model year. This approach forces manufacturers to use their credits in a sub-optimal way, and can result in stranded credits.

We suggest that a better approach to calculating compliance is to measure compliance based on each manufacturer's test results, and then allow the companies to apply earned credits as they see fit. Allowing for that flexibility allows each manufacturer to optimize its planning, and does not reduce overall benefits since the credits have already been earned. Unlike "credits" for advanced technologies and alternative fuel capability, which are included in the base fuel economy performance determination, credits earned for air conditioning leakage and efficiency and for the use of off-cycle technologies are tracked and reported separately for the car and truck fleets in the final model year reports.

Our suggested approach is consistent with the way in which the agencies interpreted credit management in the 2009 – 2011 model years ("early credits"), in which manufacturers were able to apply carry forward credits before current model year earned credits were applied. Manufacturers provided the pre-Model Year reports, in which certain credit categories (such as off-cycle credits and air conditioning leakage and efficiency credits) were tracked and listed separately.

Those credits, as well as other Averaging, Banking, and Trading (ABT) credits, should all be available to companies to apply as they see fit. By inserting an artificial priority on the application of those credits, the agencies are imposing the possibility that some credits may expire before they are allowed to be used. That devalues credit creation and unnecessarily detracts from the incentive to develop and deploy novel technology as early as possible.

The Petitioners request the agencies to reconfirm the original approach to allow manufacturers to manage and apply their credits, regardless of the origin of the credits in their accounts. While the current regulations do not preclude the continuation of this optimal credit management, the regulation should be clarified to inform future guidance.

Recommendation

Amend 40 CFR 86.1865(k)(5) to read as follows:

(5) Total credits or debits generated in a model year, maintained and reported separately for passenger automobiles and light trucks, shall be the sum of the credits or debits calculated in

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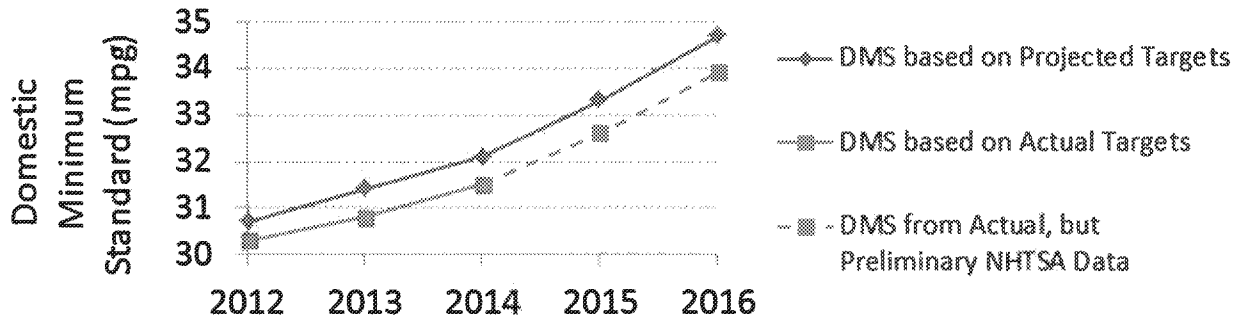
paragraph (k)(4) of this section, ***plus any credits earned in a prior model year and used by the manufacturer to fully or partially offset any such debits in accordance with paragraph (k)(7)(i) of this section, plus*** any of the following credits, if applicable, minus any N_2O and/or CH_4 CO_2-equivalent debits calculated according to the provisions of § 86.1818–12(f)(4):

(i) Air conditioning leakage credits earned according to the provisions of § 86.1867–12(b);
(ii) Air conditioning efficiency credits earned according to the provisions of § 86.1868–12(c);
(iii) Off-cycle technology credits earned according to the provisions of § 86.1869–12(d).
(iv) Full size pickup truck credits earned according to the provisions of § 86.1870–12(c).
(v) N2O and/or CH4 CO2-equivalent debits accumulated according to the provisions of § 86.1818–12(f)(4).

7. *Adjust the CAFE Minimum Domestic Passenger Car Standard to Reflect The Final Standard Applicable to Each Model Year*

NHTSA is required by statute to establish a minimum standard for domestic passenger vehicles that, effectively, is 92% of the average fuel economy projected for the combined domestic and imported passenger automobile fleets manufactured for sale in the United States by all manufacturers in the model year. The projected minimum standard must be published at the same time as the standards upon which they are based and promulgated. *See* 49 U.S.C. § 32902(b)(4).

Fuel economy standards under the attribute-based system should reflect a manufacturer's actual fleet mix. The minimum domestic passenger car standard was intended to protect small car production in the United States by imposing a minimum standard for domestically produced passenger cars. Macro-economic factors play a significant role, however, in the extent to which the projections manifest in later years. Neither the agency nor the manufacturers can fully predict and account for macro-trends impacting the motor vehicle market. As a result, and as NHTSA has intimated in the course of rulemaking, it is appropriate to revisit the projections to base them on the standards for passenger cars that emerge once the fleet mix is settled. The chart below shows the difference that has emerged between the domestic minimum standards based on NHTSA projections and the domestic minimum standard based on the actual passenger car targets.



We believe that the statutory intent was in fact to base the minimum domestic passenger car standard on the final "standard," and not merely on the initial estimate of what the standard might be in the future. This is reflected in the statutory reference to using either the 27.5 mpg traditional passenger car standard or the percentage of the attribute-based standard.

Establishing the minimum domestic passenger car standard in this way takes into account manufacturers' planning as well as unexpected market demand. As long as manufacturers have engaged in a good faith effort to meet the projected minimum domestic passenger car standard, they should not be penalized if market conditions drive consumer choices elsewhere. While the minimum domestic passenger car standard may be well-intentioned, it should be noted that noncompliance despite good faith efforts will not result in more domestic employment, but rather in the unintentional payment of CAFE fines.

Accordingly, NHTSA should adjust the minimum domestic passenger car standard, as finally entered, to reflect 92% of the required average fuel economy passenger car standards in order to maintain consistency with market conditions and the Congressional intent to ensure that efforts are made in good faith to ensure domestic investment in-line with external market forces.

8. *Correct the Multiplier for BEVs, PHEVs, FCVs, and CNGs*

The GHG program includes volume multipliers for low emission vehicles in order to promote the production of these disruptive technologies and to encourage consumer acceptance. Although not a direct harmonization issue, Petitioners' members have noted that the equation through which the number of earned credits is calculated is inaccurately stated in the regulations. The multiplier goes into effect with MY 2017 and this Direct Final Rule would be an appropriate place to correct the inadvertent error.

The illustration below provides a simple example of the credits received and credits inadvertently lost for a manufacturer that sells 5,000 BEVs in 2017-2021 MYs with the multiplier as finalized. The green bars represent the credit received with the multiplier as finalized in the 2017-2025 final rule and the red bars represent the intended credit.

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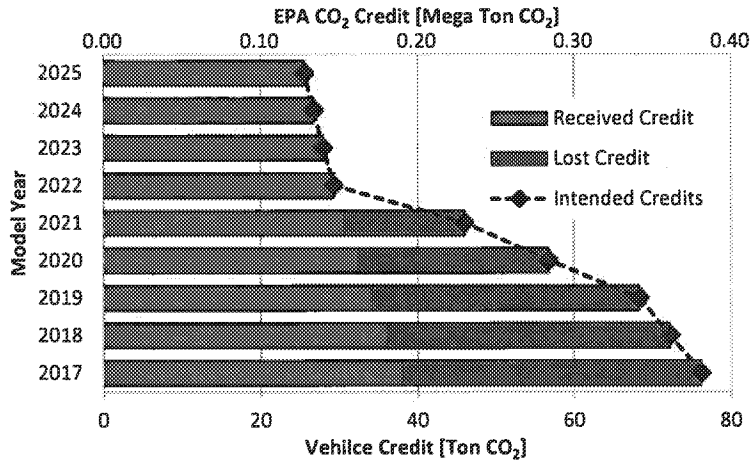

Originally, the volume multiplier was used to compute the fleet averaged carbon related exhaust emissions. The volume multiplier was incorrectly applied to the vehicle volume (when applicable) in 40 CFR 86.1866 (b) (3). The volume multiplier should be applied to the on-cycle vehicle credit (CO2,i Target – CREEi) of the preferred technologies (e.g. BEV, PHEV, CNG, or FCV). The Petitioners request that EPA correct the advanced credit multiplier calculation.

Recommendation

The methodology ultimately adopted should provide the incentive originally intended by the rule while respecting the fact that some manufacturers have already made plans according to the rules as they exist. Because the derivation of the multiplier equation involves several sections of the regulatory text, we are not proposing specific regulatory changes at this time. The final form of the changes, however, would reflect the following:

CFR Version $CO2\ Credits\ or\ Debits = (STD - CREE_{Avg}) \times VLM \times Production, [Mg]$

Corrected $CO2\ Credits\ or\ Debits = (STD_c - CREE_{Avg,c}) \times VLM \times Production, [Mg]$

CFR Averages $STD = \frac{\sum T \times Vol}{\sum Vol}, \left[{}^{g}/_{mile}\right]$ $CREE_{AVG} = \frac{\sum CREE \times Vol \times M}{\sum Vol \times M}, \left[{}^{g}/_{mile}\right]$

Corrected Averages $STD_c = \frac{\sum T \times Vol \times M}{\sum Vol}, \left[{}^{g}/_{mile}\right]$ $CREE_{AVG,c} = \frac{\sum CREE \times Vol \times M}{\sum Vol}, \left[{}^{g}/_{mile}\right]$

Where:
T = Model Type Footprint Target
M = Multiplier
C = "Corrected"

We look forward to working with the Agency in developing the appropriate regulatory changes.

9. *Provide an Improved Off-Cycle Credit Approval Process*

Although EPA has noted the importance of innovative technologies and encouraged the development of off-cycle credits, in some instances, the agency has been unable to process petitions for off-cycle credits as expected. This has occurred even when a manufacturer has provided all of the requisite information specified in the rule. Moving forward, of course, both agencies will be involved in managing that portion of the program and ensuring that the benefits of these innovative technologies are recognized.

In order to maintain the effectiveness of the off-cycle program, the agencies should:

- re-affirm that technologies meeting the stated definitions are entitled to the off-cycle credits at the values stated in the regulation;
- re-acknowledge that technologies shown to generate more emissions reductions than the pre-approved amount are entitled to additional credit;
- confirm that technologies not in the null vehicle set (the null vehicle being a MY2008 vehicle with naturally aspirated, port fuel injection, fixed cam timing engine, 4 speed transmission, and no weight reduction), but which are demonstrated to provide emissions reductions benefits constitute off-cycle credits; and
- modify the off-cycle program to account for unanticipated delays in the approval process by providing that applications based on the 5-cycle methodology are to be deemed approved if not acted upon by the agencies within a specified timeframe (for instance 90 days), subject to any subsequent review of accuracy and good faith.

Conclusion

The Petitioners seek immediate and direct action on the issues above because their resolution will significantly affect petitioners' ability to comply with the CAFE standards moving forward into MYs 2017-2021. While the later standards for MYs 2022-2025 will be subject to reconsideration, during the interim years petitioners face the prospect of complying with the numerically more stringent GHG standards while not being able – even with the same vehicle fleet and same technology application – to meet the corresponding CAFE standards.

The Petitioners request the agencies issue a Direct Final Rule adopting the modifications set forth above to bring to fruition and to improve the National Program.

The Petitioners look forward to working with the agencies during the mid-term evaluation and analyzing the various technical and policy considerations that will arise during that review.

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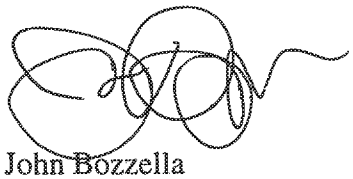
We would be glad to meet with Agency staff to answer any question about the material in this petition.

Sincerely,



Mitch Bainwol
President and CEO
Alliance of Automobile Manufacturers

John Bozzella
President and CEO
Association of Global Automakers

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Message

From: Rick Gezelle (TMNA) [rick.gezelle@toyota.com]
Sent: 6/5/2017 5:32:43 PM
To: Olechiw, Michael [olechiw.michael@epa.gov]
CC: Bolon, Kevin [Bolon.Kevin@epa.gov]; Moran, Robin [moran.robin@epa.gov]
Subject: Re: Follow-up from March 28th EPA/Toyota Meeting

Thanks Mike.

I was out of the office the end of last week and am just now getting a chance to respond. What Kevin sent back in April is fine. I thought we had discussed that … sorry for any confusion if I did not pass along my thoughts. It would be great to talk about the spreadsheet that you just sent Friday to make sure I understand everything.

We'll figure out what slides from the March 28 materials we can supply and get them to you soon.

Thanks again. -Rick

On May 31, 2017, at 4:24 PM, Olechiw, Michael <olechiw.michael@epa.gov> wrote:

Hello Rick,

I needed to refresh my memory on what we owed you. My team send you a sample Excel file on 4/20 and asked if it was representative of what you were looking for. Evidently we did not hear back so we are still in a holding pattern. If you could confirm the file, that would help us meet your request.

On another topic, would it be possible to receive Toyota's materials from our last meeting? Please let me know.

Best Regards,

Mike

From: Rick Gezelle (TMNA) [mailto:rick.gezelle@toyota.com]
Sent: Tuesday, May 23, 2017 1:38 PM
To: Olechiw, Michael <olechiw.michael@epa.gov>
Cc: Moran, Robin <moran.robin@epa.gov>; Bolon, Kevin <Bolon.Kevin@epa.gov>; Barba, Daniel <Barba.Daniel@epa.gov>; Charmley, William <charmley.william@epa.gov>
Subject: RE: Follow-up from March 28th EPA/Toyota Meeting

Mike – Hope all is well.

I'm just checking in to see when we can expect to receive the follow up data we discussed on the Toyota CBI analysis.

I have a meeting later today with colleagues in Japan, and I'm sure this will come up.

Thanks. -Rick

From: Olechiw, Michael [mailto:olechiw.michael@epa.gov]
Sent: Monday, April 03, 2017 4:09 PM

To: Rick Gezelle (TMNA) <rick.gezelle@toyota.com>
Cc: moran.robin epa.gov <moran.robin@epa.gov>; Bolon, Kevin <Bolon.Kevin@epa.gov>; Barba, Daniel <Barba.Daniel@epa.gov>; Charmley, William <charmley.william@epa.gov>
Subject: Follow-up from March 28th EPA/Toyota Meeting

Rick,

Thank you very much the time you and your colleagues took to meet with us last week. We hope that you found meeting to be as valuable as we did.

As a follow up to our meeting we agreed that we would share notes and action items. The list below is our first draft of the follow-up questions and deliverables. Please review the list and provide feedback and updates.

Best Regards,

Mike

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USEPA/OTAQ/ASD
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olechiw.michael@epa.gov

Follow-up to March 28th Toyota-EPA/NTSA/ARB Meeting
April 3, 2017 (draft)
Requests from Toyota

- During the March 28th meeting, Toyota requested additional information regarding the presentation given by EPA on compliance scenarios based on Toyota CBI and non-CBI. Specifically, Toyota requested:
    1. Compliance grids shown in slides 9 and 10, with the values of CO2 credits (Mg) shown for each year.
    2. Compliance grids with additional restrictions placed on the full-redesign timing for each vehicle (i.e. no redesigns allowed during MYs 2016 and 2017.)
        - Alternatively, Toyota could supply a redesign schedule for EPA analysis
    3. Can EPA provide the incremental effectiveness for individual technologies?
        - We would like additional background on this request: Purpose, baseline, which technologies, order of application of technologies
        - *EPA would like to suggest that we provide the base engine maps used in our analysis and modelled by ALPHA to avoid the potential for non-representative comparisons.*

Requests to Toyota

- EPA would like to receive feedback on the powertrain efficiency curves shown in the EPA presentation.
    1. Are the CBI curves representative of the information Toyota provided and if not, what would Toyota curves look like?

2. Is the non-CBI curve representative of Toyota's TNGA engine, improved 8/10 speed transmissions and start/stop? If not, would Toyota provide an alternative curve?

- In written comments, Toyota has described plans to provide additional information that would help inform updates to the analyses of the MY2022-2025 standards. Please provide the approximate timing for when this information will be available, and if possible some additional detail about the content. Specifically, in Toyota's December 30, 2017 comments on EPA's Proposed Determination, Toyota cited ongoing technical work and plans to share information as part of the Midterm Evaluation:
    1. "We [Toyota] intend to submit to both EPA and NHTSA updated confidential product and technology information during the first quarter of 2017 as we continue to operate under the original expected midterm review timeline." (cover letter)
    2. "We [Toyota] intend to provide technology performance data under a claim of Confidential Business Information (CBI) as part of the ongoing midterm review process, but not until after the 30 day comment period [of the November 2016 Proposed Determination.]" (Attachment I, pg 6)
    3. "... plan to submit updated CBI compliance projections during the first quarter of 2017 as we had anticipated under the existing midterm review schedule." (Attachment I, pg 7)

Message

From: Rick Gezelle (TMNA) [rick.gezelle@toyota.com]
Sent: 6/2/2017 8:35:27 PM
To: Olechiw, Michael [olechiw.michael@epa.gov]
CC: Bolon, Kevin [Bolon.Kevin@epa.gov]; Moran, Robin [moran.robin@epa.gov]
Subject: Re: Follow-up from March 28th EPA/Toyota Meeting

Mike - Thanks so much. I thought we had verbally agreed on the sample data you had sent. I'm out of the office until Monday and will look at the spreadsheet then. I'll also figure out what slides we can send from the March 28 meeting.

Have a great weekend. -Rick

> On Jun 2, 2017, at 4:14 PM, Olechiw, Michael <olechiw.michael@epa.gov> wrote:
>
> Rick,
>
> Based on the 4/20 sample file that Kevin sent, we went ahead and prepared the attached Excel file with the vehicle-level detail that underlies the EPA compliance grids presented to Toyota on March 28th. In that file, you will find 14 tabs containing details for each of the 7 steps in the non-CBI and CBI grids.
>
> At the March meeting, Okama-san had asked if we could provide the gram CO2 values for each cell of the compliance grid. We've included those values (in Tg CO2) in the attached update to the March 28 slide deck on Slides 9 and 10. The 'CreditSumbyYear' tab of the Excel file also contains a calculator so you can see how the Tg CO2 values in slides 9 and 10 are derived for car, truck, and combined fleets by year.
>
> For next steps, you had suggested that we consider different assumptions for redesign years. If you have any specific assumptions, we would be able to see what the effects are on the credit grid. Also, if Toyota has any feedback or alternative assumptions for the powertrain efficiency curves, levels of tractive load reduction, or AC and off-cycle credits. In particular, we are interested in Toyota's feedback on the powertrain efficiency curves.
>
> Finally, we would very much like to receive Toyota's materials from our March 28th meeting and if you had feedback on the items that Toyota noted in your comments for the Proposed Determination, it would also be helpful.
>
> Best Regards,
>
> 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
>
>
> · In written comments, Toyota has described plans to provide additional information that would help inform updates to the analyses of the MY2022-2025 standards. Please provide the approximate timing for when this information will be available, and if possible some additional detail about the content. Specifically, in Toyota's December 30, 2017 comments on EPA's Proposed Determination, Toyota cited ongoing technical work and plans to share information as part of the Midterm Evaluation:
>
> 1. "We [Toyota] intend to submit to both EPA and NHTSA updated confidential product and technology information during the first quarter of 2017 as we continue to operate under the original expected midterm review timeline." (cover letter)
>
> 2. "We [Toyota] intend to provide technology performance data under a claim of Confidential Business Information (CBI) as part of the ongoing midterm review process, but not until after the 30 day comment period [of the November 2016 Proposed Determination.]" (Attachment I, pg 6)
>
> 3. "… plan to submit updated CBI compliance projections during the first quarter of 2017 as we had anticipated under the existing midterm review schedule." (Attachment I, pg 7)
>
> <VehicleDataforComplianceGrid_2017_03_28ToyotaMeeting_rev20170602.xlsx>

> <Meeting with Toyota 28 3 2017_rev20170602.pptx>

Message

From: Michael Hartrick [MHartrick@autoalliance.org]
Sent: 5/18/2017 4:48:49 PM
To: Olechiw, Michael [olechiw.michael@epa.gov]
CC: Bolon, Kevin [Bolon.Kevin@epa.gov]; Cherry, Jeff [Cherry.Jeff@epa.gov]; Moran, Robin [moran.robin@epa.gov]; Chris Nevers [CNevers@autoalliance.org]
Subject: Your Request to Participate in Trade Association Meeting with NHTSA

Hi Mike,

I tried to call you a few minutes ago. As follow-up to that call, thanks for reaching out to us to discuss the Midterm Evaluation. Chris Nevers asked me to respond to your request to participate in upcoming meetings that the Alliance and Global Automakers have scheduled with NHTSA next week. The materials that we have prepared for those meetings focus on technical input specific to NHTSA. Therefore, we would propose initial separate meetings with the EPA to discuss EPA specific issues.

We'd like discuss technical issues specific to EPA's modeling and analysis such as the concerns highlighted below. I suggest two meetings: (1) a briefing from Novation Analytics to discuss recent analysis of proposed determination modeling work; and (2) a broader meeting with the manufacturers to discuss technical concerns and questions. The Novation Analytics work is funded jointly by the Auto Alliance and Global Automakers and would therefore involve both light-duty automotive trade associations. Similarly, the Auto Alliance would suggest Global Automakers' participation in the second meeting so that all interested light-duty automakers have the opportunity to share their input and to engage with EPA efficiently. Such a set of meetings may also provide the opportunity for EPA to discuss on-going work and plans for the midterm evaluation.

Michael Hartrick
Director of Fuel Economy & Climate
Alliance of Automobile Manufacturers
Desk (248) 357-4717 x103
[redacted]
MHartrick@autoalliance.org

From: Olechiw, Michael [mailto:olechiw.michael@epa.gov]
Sent: Tuesday, May 9, 2017 12:54 PM
To: Michael Hartrick <MHartrick@autoalliance.org>
Cc: Bolon, Kevin <Bolon.Kevin@epa.gov>; Cherry, Jeff <Cherry.Jeff@epa.gov>; Moran, Robin <moran.robin@epa.gov>
Subject: RE: Nov. 2016 Proposed Determination - Figure 2.100 (p. 2-286)

Mike,

I just wanted to give you an update regarding your request. We have reviewed your concerns and we do not agree that we have over-assessed the technology. In order to avoid additional questions our plan is to provide a full accounting of all the points on the graph. You can expect to receive that summary late next week.

In the interim, please let me know if you have any other questions.

Best Regards,

Mike

Michael R. Olechiw
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Tel: +1-734-214-4297
[redacted]
Fax: +1-734-214-4050
olechiw.michael@epa.gov

From: Michael Hartrick [mailto:MHartrick@autoalliance.org]
Sent: Thursday, May 04, 2017 11:48 AM
To: Olechiw, Michael <olechiw.michael@epa.gov>
Cc: Bolon, Kevin <Bolon.Kevin@epa.gov>; Cherry, Jeff <Cherry.Jeff@epa.gov>; Moran, Robin <moran.robin@epa.gov>
Subject: RE: Nov. 2016 Proposed Determination - Figure 2.100 (p. 2-286)

Mike, et al.,

Sorry to be a bother, but I'm still struggling with this Figure and am hoping you can provide further clarification. I want to make sure that I am not going to highlight what I see as a potential issue to you, and then have you tell me that I just don't understand. That's my point – I clearly don't understand what I'm looking at when I try to align all of the data available, hence my concern that there is an issue that results in over-prediction of technology benefit. The following is an example of one of my specific issues:

Take Vehicle 1498 (Honda Pilot 4wd). The Proposed Determination OMEGA files (2025 control central analysis) show this vehicle as starting with a tailpipe CO2 value of 344.4 grams per mile (TP00). Your Figure 2.100 shows that the LPM should provide a net technology benefit between TP06 and TP00 of roughly 26-28% (hard to read the value off the Figure with greater specificity). I can come close to these values by manually entering in the baseline vehicle data and the modified vehicle data in the LPM machine spreadsheet. Therefore, I should expect 1498_TP06 to have a final tailpipe CO2 value of roughly 248 to 255 g/mi. However, the OMEGA output for 1498_TP06 tailpipe CO2 is 228.4, a benefit of 33.7% which is roughly 25% higher than what the LPM manually manipulated provided.

Differences such as these are a significant concern. Can you please explain why I am getting such a large difference? (Data supporting the explanation may help me also...)

Thanks again.

Michael Hartrick
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Alliance of Automobile Manufacturers
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[redacted]
MHartrick@autoalliance.org

From: Olechiw, Michael [mailto:olechiw.michael@epa.gov]
Sent: Thursday, April 13, 2017 3:14 PM
To: Michael Hartrick <MHartrick@autoalliance.org>
Cc: Bolon, Kevin <Bolon.Kevin@epa.gov>; Cherry, Jeff <Cherry.Jeff@epa.gov>; Moran, Robin <moran.robin@epa.gov>
Subject: FW: Nov. 2016 Proposed Determination - Figure 2.100 (p. 2-286)

Mike,

The attached file contains the raw ALPHA output that was used to generate the ALPHA effectiveness numbers shown in Figure 2.100 of the Proposed Determination TSD. The ALPHA effectiveness for each vehicle in Figure 2.100 is determined from two ALPHA runs represented by a pair of rows in this file; the first for the MY2015 baseline vehicle, and the second for an advanced tech packages applied to that vehicle for MY2025. For example, rows 9 and 10 are for Vehicle Index 773 (an F150). The effectiveness value of 25.82% shown in Column BU, is calculated from the improvement in the GHG values in Column BT from MY2015 (row 9 = 346.8 g/mi) to MY2025 (row 10 = 257.2 g/mi).

Note that these ALPHA runs were conducted in November for the sole purpose of demonstrating the ability of the LPM to reliably replicate the ALPHA results. The output of these specific runs were used to generate Figure 2.100, and were not used elsewhere in the PD analysis.

Please let me know if you have any other questions.

Best Regards,

Mike

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Director - Light-duty Vehicles and Small Engines Center
USEPA/OTAQ/ASD
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Ann Arbor MI 48105
Tel: +1-734-214-4297
[redacted]
Fax: +1-734-214-4050
olechiw.michael@epa.gov

Message

From: Safoutin, Mike [safoutin.mike@epa.gov]
Sent: 5/17/2017 7:07:58 PM
To: Ahmed, Shabbir [ahmeds@anl.gov]
CC: McDonald, Joseph [McDonald.Joseph@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Dees, Dennis W. [dees@anl.gov]
Subject: RE: Possibly meet during DOE Merit Review

Thanks for the info, Shabbir. I'll plan on getting in touch with you during the AMR to discuss this further. I anticipate that it shouldn't be a problem for me to visit your facility sometime in the next month or two, and I look forward to meeting Paul and Dennis in person. Thanks, and see you at the AMR.

Mike

From: Ahmed, Shabbir [mailto:ahmeds@anl.gov]
Sent: Tuesday, May 16, 2017 3:54 PM
To: Safoutin, Mike <safoutin.mike@epa.gov>
Cc: McDonald, Joseph <McDonald.Joseph@epa.gov>; Olechiw, Michael <olechiw.michael@epa.gov>; Dees, Dennis W. <dees@anl.gov>
Subject: RE: Possibly meet during DOE Merit Review

Hi Mike,
Good to hear from you. I will be at the AMR and we should definitely sit down together to update each other. My cell phone number is [redacted]

Yes, Kevin did join Bosch near the end of last year. It was a good move for him and we miss him here. I have been responsible for BatPaC for the past 3 years and am still learning as we continue to improve the spreadsheet. Paul Nelson is helping me and Dennis Dees is our go-to person on electrochemical matters.

We would really appreciate the opportunity to hear about your use of the model. While I could come and visit you, it would be easier if you could take a day and come visit us, since Paul cannot travel and he would be very interested to hear about your work and his participation in the discussion would be very valuable. Please let me know your availability.

Thanks.
Shabbir

From: Safoutin, Mike [mailto:safoutin.mike@epa.gov]
Sent: Tuesday, May 16, 2017 2:39 PM
To: Ahmed, Shabbir
Cc: McDonald, Joseph; Olechiw, Michael
Subject: Possibly meet during DOE Merit Review

Hi Shabbir,

I just wanted to let you know that I'll be attending the DOE AMR, and wondered if you will also be attending, or if anyone else who is currently working on BatPaC will be there. I think this would be a good opportunity to touch base on where future development stands, as we periodically have done in the past. I also heard a rumor that Kevin Gallagher moved to work at Bosch (I think). If so, could you let me know who comprises the core BatPaC team and management today?

I'd also like to discuss the possibility of getting some feedback in the future on how we are using BatPaC for the battery cost analysis that went into the Midterm Review. For example, when developing the 2017-2025 LD GHG rulemaking in 2011, we sat down with some folks at ANL and briefed them on the way we were proposing to use the model and many of the specific inputs we had developed. Obviously our inputs have evolved a lot since then, as have the pack configurations. I expect to do another modeling run soon, and it may be valuable not only for us but also for your team to see how we are using the model and interpreting its outputs, and see if there is anything new your team can recommend.

Hope to see you in DC - thanks,

Mike

Michael J. Safoutin, Ph.D.
Mechanical Engineer
Assessment and Standards Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency
2000 Traverwood Drive, Ann Arbor, MI 48105
(734) 214-4348
Safoutin.Mike@epa.gov

Message

From: Ahmed, Shabbir [ahmeds@anl.gov]
Sent: 5/16/2017 7:54:16 PM
To: Safoutin, Mike [safoutin.mike@epa.gov]
CC: McDonald, Joseph [McDonald.Joseph@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]; Dees, Dennis W. [dees@anl.gov]
Subject: RE: Possibly meet during DOE Merit Review

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Sent: Tuesday, May 16, 2017 2:39 PM
To: Ahmed, Shabbir
Cc: McDonald, Joseph; Olechiw, Michael
Subject: Possibly meet during DOE Merit Review

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Michael J. Safoutin, Ph.D.

Mechanical Engineer
Assessment and Standards Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency
2000 Traverwood Drive, Ann Arbor, MI 48105
(734) 214-4348
Safoutin.Mike@epa.gov

Message

From: Safoutin, Mike [safoutin.mike@epa.gov]
Sent: 5/16/2017 7:38:41 PM
To: Ahmed, Shabbir [ahmeds@anl.gov]
CC: McDonald, Joseph [McDonald.Joseph@epa.gov]; Olechiw, Michael [olechiw.michael@epa.gov]
Subject: Possibly meet during DOE Merit Review

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Mechanical Engineer
Assessment and Standards Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency
2000 Traverwood Drive, Ann Arbor, MI 48105
(734) 214-4348
Safoutin.Mike@epa.gov

Message

From: traffic [traffic@davidpublishing.com]
Sent: 5/5/2017 3:33:26 AM
To: Olechiw, Michael [olechiw.michael@epa.gov]
CC: JTTE_davidpublishing [JTTE_davidpublishing@yahoo.com]
Subject: [SPAM] Have you received our email? - From Journal of Traffic and Transportation Engineering

From Knowledge to Wisdom
Journal of Traffic and Transportation Engineering
ISSN: 2328-2142 DOI: 10.17265/2328-2142

Dear Michael Olechiw,

This is *Journal of* ***Traffic and Transportation Engineering*** (ISSN 2328-2142), a professional journal published across the United States by David Publishing Company, Valley Cottage, NY, USA.

We have learned your paper **Electrified Vehicles in the 2017-2025 Light-Duty Greenhouse Gas Regulation and the Midterm Evaluation** in **The 2015 Hybrid and Electric Vehicle Technologies Symposium .**

We sent our **CALL FOR PAPER** to you some days ago and we are now wondering whether you have received it or not, since we have got no reply from you. So, would you be so kind to inform us of a receipt? Or do you have the interest to cooperate? Please feel free to let us know.
Eagerly to expect to get your reply!

Best regards,

Linda
Editorial Office
Journal of Traffic and Transportation Engineering,
David Publishing Company

616Corporate Way, Suite 2-4876 Valley Cottage, NY 10989, USA
E-mail: traffic@davidpublishing.com, JTTE_davidpublishing@yahoo.com

Message

From: traffic [traffic@davidpublishing.com]
Sent: 4/24/2017 6:32:11 AM
To: Olechiw, Michael [olechiw.michael@epa.gov]
CC: JTTE_davidpublishing [JTTE_davidpublishing@yahoo.com]
Subject: Call for paper-Journal of Traffic and Transportation Engineering, USA

From Knowledge to Wisdom

Journal of Traffic and Transportation Engineering

ISSN: 2328-2142 DOI: 10.17265/2328-2142

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We have learned your paper **Electrified Vehicles in the 2017-2025 Light-Duty Greenhouse Gas Regulation and the Midterm Evaluation** in **The 2015 Hybrid and Electric Vehicle Technologies Symposium .**

We are very interested in your paper and also would like to publish your other **unpublished papers** in the ***Journal of Traffic and Transportation Engineering***. If you have the idea of making our journal a vehicle for your research interests, please send electronic version of your **papers or books** to us through email attachment in ***MS word format*** or submit it via our Online Submission System, and you are also welcome to check our homepage and latest issue via the quick link as follows:

Homepage Submission

Hope to keep in touch by email and publish some papers or books from you and your friends. As an American academic publishing group, we wish to become your friends if we may.

Best regards,

Linda
Editorial Office
Journal of Traffic and Transportation Engineering,
David Publishing Company

616Corporate Way, Suite 2-4876 Valley Cottage, NY 10989, USA
E-mail: traffic@davidpublishing.com, JTTE_davidpublishing@yahoo.com

Call for Paper

Description

Journal of Traffic and Transportation Engineering is an international, scholarly and peer-reviewed journal (print and online) published monthly by David Publishing Company, USA which was founded in 2001. The journal covers all sorts of researches on railway engineering, road engineering, port and coastal engineering and waterway engineering, engineering management, information management, etc. as well as other issues.

The topics covered in the journal mainly include (but not limit to): Exploration, design, construction and maintenance for railway engineering, road engineering, port and coastal engineering and waterway engineering; Tunneling; layout and construction of the related infrastructures; Traffic information engineering and control; Design and manufacture of transport vehicles; Transportation planning and management..

The journal is published in English. The e-journal provides free and open access to all of its content on our website. Accepted papers will immediately appear online followed by printed in hard copy.

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2. Manuscripts may be 4000-15000 words or longer if approved by the editor, including an abstract, texts, tables, footnotes, appendixes, and references. The title should be on page 1 and not exceed 15 words, and should be followed by an abstract of 100-200 words. 3-5 keywords or key phrases are required.
3. The manuscript should be in MS Word format, submitted as an email attachment to our email address.
4. Authors of the articles being accepted are required to sign up the Transfer of Copyright Agreement form.
5. Author will receive 2 hard copies of the journal containing their articles.
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Address of China Branch: P.O. Box 71613008, Wuhan, Hubei Province, P. R. China. Postal Code: 430071
Email: traffic@davidpublishing.com, shelly@davidpublishing.com

Message

From: Olechiw, Michael [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9F564B92FF96459AB606EB66E5892E2D-OLECHIW, MICHAEL]
Sent: 6/2/2017 7:58:17 PM
To: Rick Gezelle (TMNA) [rick.gezelle@toyota.com]
CC: Bolon, Kevin [bolon.kevin@epa.gov]; Moran, Robin [moran.robin@epa.gov]
Subject: FW: Follow-up from March 28th EPA/Toyota Meeting
Attachments: VehicleDataforComplianceGrid_2017_03_28ToyotaMeeting_rev20170602.xlsx; Meeting with Toyota 28 3 2017_rev20170602.pptx

Rick,

Based on the 4/20 sample file that Kevin sent, we went ahead and prepared the attached Excel file with the vehicle-level detail that underlies the EPA compliance grids presented to Toyota on March 28th. In that file, you will find 14 tabs containing details for each of the 7 steps in the non-CBI and CBI grids.

At the March meeting, Okama-san had asked if we could provide the gram CO2 values for each cell of the compliance grid. We've included those values (in Tg CO2) in the attached update to the March 28 slide deck on Slides 9 and 10. The 'CreditSumbyYear' tab of the Excel file also contains a calculator so you can see how the Tg CO2 values in slides 9 and 10 are derived for car, truck, and combined fleets by year.

For next steps, you had suggested that we consider different assumptions for redesign years. If you have any specific assumptions, we would be able to see what the effects are on the credit grid. Also, if Toyota has any feedback or alternative assumptions for the powertrain efficiency curves, levels of tractive load reduction, or AC and off-cycle credits. In particular, we are interested in Toyota's feedback on the powertrain efficiency curves.

Finally, we would very much like to receive Toyota's materials from our March 28th meeting and if you had feedback on the items that Toyota noted in your comments for the Proposed Determination, it would also be helpful.

Best Regards,

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

- In written comments, Toyota has described plans to provide additional information that would help inform updates to the analyses of the MY2022-2025 standards. Please provide the approximate timing for when this information will be available, and if possible some additional detail about the content. Specifically, in Toyota's December 30, 2017 comments on EPA's Proposed Determination, Toyota cited ongoing technical work and plans to share information as part of the Midterm Evaluation:
    1. "We [Toyota] intend to submit to both EPA and NHTSA updated confidential product and technology information during the first quarter of 2017 as we continue to operate under the original expected midterm review timeline." (cover letter)

2. "We [Toyota] intend to provide technology performance data under a claim of Confidential Business Information (CBI) as part of the ongoing midterm review process, but not until after the 30 day comment period [of the November 2016 Proposed Determination.]" (Attachment I, pg 6)
3. "… plan to submit updated CBI compliance projections during the first quarter of 2017 as we had anticipated under the existing midterm review schedule." (Attachment I, pg 7)

Message

From: Olechiw, Michael [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9F564B92FF96459AB606EB66E5892E2D-OLECHIW, MICHAEL]
Sent: 5/31/2017 8:23:57 PM
To: Rick Gezelle (TMNA) [rick.gezelle@toyota.com]
CC: Bolon, Kevin [bolon.kevin@epa.gov]; Moran, Robin [moran.robin@epa.gov]
Subject: RE: Follow-up from March 28th EPA/Toyota Meeting

Hello Rick,

I needed to refresh my memory on what we owed you. My team send you a sample Excel file on 4/20 and asked if it was representative of what you were looking for. Evidently we did not hear back so we are still in a holding pattern. If you could confirm the file, that would help us meet your request.

On another topic, would it be possible to receive Toyota's materials from our last meeting? Please let me know.

Best Regards,

Mike

From: Rick Gezelle (TMNA) [mailto:rick.gezelle@toyota.com]
Sent: Tuesday, May 23, 2017 1:38 PM
To: Olechiw, Michael <olechiw.michael@epa.gov>
Cc: Moran, Robin <moran.robin@epa.gov>; Bolon, Kevin <Bolon.Kevin@epa.gov>; Barba, Daniel <Barba.Daniel@epa.gov>; Charmley, William <charmley.william@epa.gov>
Subject: RE: Follow-up from March 28th EPA/Toyota Meeting

Mike – Hope all is well.

I'm just checking in to see when we can expect to receive the follow up data we discussed on the Toyota CBI analysis.

I have a meeting later today with colleagues in Japan, and I'm sure this will come up.

Thanks. -Rick

From: Olechiw, Michael [mailto:olechiw.michael@epa.gov]
Sent: Monday, April 03, 2017 4:09 PM
To: Rick Gezelle (TMNA) <rick.gezelle@toyota.com>
Cc: moran.robin epa.gov <moran.robin@epa.gov>; Bolon, Kevin <Bolon.Kevin@epa.gov>; Barba, Daniel <Barba.Daniel@epa.gov>; Charmley, William <charmley.william@epa.gov>
Subject: Follow-up from March 28th EPA/Toyota Meeting

Rick,

Thank you very much the time you and your colleagues took to meet with us last week. We hope that you found meeting to be as valuable as we did.

As a follow up to our meeting we agreed that we would share notes and action items. The list below is our first draft of the follow-up questions and deliverables. Please review the list and provide feedback and updates.

Best Regards,

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

Follow-up to March 28th Toyota-EPA/NTSA/ARB Meeting
April 3, 2017 (draft)
Requests from Toyota

- During the March 28th meeting, Toyota requested additional information regarding the presentation given by EPA on compliance scenarios based on Toyota CBI and non-CBI. Specifically, Toyota requested:
    1. Compliance grids shown in slides 9 and 10, with the values of CO2 credits (Mg) shown for each year.
    2. Compliance grids with additional restrictions placed on the full-redesign timing for each vehicle (i.e. no redesigns allowed during MYs 2016 and 2017.)
        - Alternatively, Toyota could supply a redesign schedule for EPA analysis
    3. Can EPA provide the incremental effectiveness for individual technologies?
        - We would like additional background on this request: Purpose, baseline, which technologies, order of application of technologies
        - *EPA would like to suggest that we provide the base engine maps used in our analysis and modelled by ALPHA to avoid the potential for non-representative comparisons.*

Requests to Toyota

- EPA would like to receive feedback on the powertrain efficiency curves shown in the EPA presentation.
    1. Are the CBI curves representative of the information Toyota provided and if not, what would Toyota curves look like?
    2. Is the non-CBI curve representative of Toyota's TNGA engine, improved 8/10 speed transmissions and start/stop? If not, would Toyota provide an alternative curve?
- In written comments, Toyota has described plans to provide additional information that would help inform updates to the analyses of the MY2022-2025 standards. Please provide the approximate timing for when this information will be available, and if possible some additional detail about the content. Specifically, in Toyota's December 30, 2017 comments on EPA's Proposed Determination, Toyota cited ongoing technical work and plans to share information as part of the Midterm Evaluation:
    1. "We [Toyota] intend to submit to both EPA and NHTSA updated confidential product and technology information during the first quarter of 2017 as we continue to operate under the original expected midterm review timeline." (cover letter)
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Message

From: Olechiw, Michael [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9F564B92FF96459AB606EB66E5892E2D-OLECHIW, MICHAEL]
Sent: 5/3/2017 11:58:06 AM
To: Olechiw Family Ex. 6 - Personal Privacy
Subject: FW: Administrator Pruitt letter to California Governor Brown on May 2, 2017
Attachments: Gov Brown MTE 5-2-172017-05-02-154130.pdf; Brown CA 3.15.17_Letter_to_EPA.PDF

Ex. 6 - Personal Privacy

This is not a great way to start a Tuesday morning.

Mike

From: Charmley, William
Sent: Wednesday, May 03, 2017 7:49 AM
To: Moran, Robin <moran.robin@epa.gov>; Olechiw, Michael <olechiw.michael@epa.gov>; Orlin, David <Orlin.David@epa.gov>; Kataoka, Mark <Kataoka.Mark@epa.gov>
Cc: Simon, Karl <Simon.Karl@epa.gov>
Subject: Administrator Pruitt letter to California Governor Brown on May 2, 2017

Dear Mike and Robin,

I know it will be hard to read the messages in this letter from the Administrator, but it is what it is. In this letter the Administrator indicates that the Draft TAR, in addition to the EPA Proposed Determination and Final Determination, because of the time frame in which it was released. I don't understand the linkage between those two beliefs, but the overall message appears to be that the Administrator is distancing himself from each step taken within the MTE thus far, not just the EPA Proposed and Final Determination, which we know several stakeholders have concerns with the timing associated with those two steps, but also with the Draft TAR.

No one in OTAQ received a draft of this letter, and this signed letter, which we received late yesterday, is what we have.

My understanding is this letter is written in response to the March 15, 2017 letter from Governor Brown to the Administrator, which I have also attached.

Please let me know if either of you would like to discuss this, and if you want to discuss what messages you will want to share with the team. I think you should share both of these documents with the MTE team this morning, as I would guess it will be in the public domain in the near future.

Thanks
Bill

OFFICE OF THE GOVERNOR

March 15, 2017

The Honorable Scott Pruitt
Administrator, U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

Dear Administrator Pruitt:

President Trump's decision today to weaken emission standards in cars is an unconscionable gift to polluters. Once again, you've put the interests of big oil ahead of clean air and politics ahead of science.

And these actions have very bad consequences.

In fact, your agency's own analysis shows that over the lifetime of these cars, the 2022-25 vehicle emission standards would:

- Save consumers more than $1,650 per vehicle.
- Reduce oil consumption by nearly 40 billion gallons of refined gasoline and diesel fuel.
- Decrease greenhouse gas emissions by 540 million metric tons.

I have attached three separate reports produced by scientists, engineers and other experts analyzing the feasibility of the standards in question. All three reports demonstrate that America is on track to meet these standards. The technology is advancing and costs are coming down.

If Washington continues down this road, California will take the necessary actions to preserve current standards and protect the health of our people and the stability of our climate. We can't stand by while cases of lung disease and asthma needlessly increase and families get gouged at the pump.

When Richard Nixon established the Environmental Protection Agency in 1970, he noted that: "The Congress, the Administration and the public all share a profound commitment to the rescue of our natural environment, and the preservation of the Earth as a place both habitable by and hospitable to man."

Now is not the time to turn our back on that commitment.

Sincerely,

Edmund G. Brown Jr.

GOVERNOR EDMUND G. BROWN JR. • SACRAMENTO, CALIFORNIA 95814 • (916) 445-2841

January 18, 2017

California's Advanced Clean Cars Midterm Review

Summary Report for the Technical Analysis of the Light Duty Vehicle Standards

California Environmental Protection Agency
Air Resources Board

Executive Summary

In 2012, the California Air Resources Board (ARB or the Board) adopted the Advanced Clean Cars (ACC) program, a comprehensive set of standards for new vehicles in California through model year 2025. The components of the ACC program are the Low-Emission Vehicle III (LEV III) regulations that reduce criteria pollutants and greenhouse (GHG) emissions from light- and medium-duty vehicles for model years 2015 through 2025 and the zero-emission vehicle (ZEV) regulation, which acts as the focused technology-forcing piece of the ACC program by requiring manufacturers to produce increasing numbers of pure ZEVs (that is battery electric and fuel cell electric vehicles) and plug-in hybrid electric vehicles (PHEV) in the 2018 through 2025 model years.

When adopting these standards, the Board directed staff to conduct reviews specific to the California standards: the ZEV regulation, the 1 milligram per mile (mg/mi) particulate matter (PM) emission standard, and a general review of the format of the GHG standards, and to return with staff's review no later than December 2016. This document and its associated appendices reflect the staff assessment in response to the Board. Table ES.1 displays summaries of the Board direction to staff from the adopted Board resolution. Additionally, the Board also committed to participating in a joint-agency review with the United States Environmental Protection Agency (U.S. EPA) and the National Highway Traffic Safety Administration (NHTSA) of the 2022 through 2025 model year GHG vehicle standards.

Table ES.1. Key Board Direction in 2012 Advanced Clean Cars Resolution

Program	***Board Resolution Direction***
GHG	Participate in a joint-agency midterm evaluation with the U.S. EPA and NHTSA of the federal passenger vehicle GHG standards and corporate average fuel economy (CAFE) standards for the 2022 through 2025 model years
	Monitor consumer purchasing trends and California's fleet mix to evaluate any potential shift in vehicle footprint to larger, higher polluting vehicles and the reclassification of cars as trucks
PM	Re-examine the measurement methods, stringency, and timing of the adopted 2025 model year 1 mg/mi PM emission standard
ZEV	Monitor consumer acceptance of PHEVs and report on expected volumes in the ZEV program
	Analyze in-use data for range extended battery electric vehicles (BEVx) and PHEVs, and propose appropriate modifications as needed

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Technology Progress since 2012

A significant part of the review focused on progress in technology since the original analysis and adoption of the standards in 2012. Advancements have already occurred in the vehicle and engine technologies being introduced by vehicle manufacturers to reduce GHG and criteria pollutant emissions including PM. ZEV technology has also seen significant development that, in many cases, is beyond what was envisioned just four years ago.

GHG Emission Control Technology Developments

- Manufacturers have successfully employed a variety of technologies that reduce GHG 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 GHG requirements[1] and are offering various vehicles on the road today that are already able to comply with the GHG standards for later model years. For example, of the more than 1,300 conventional vehicle model configurations available in 2016, 23 truck configurations,[2] 23 sport utility vehicle (SUV) configurations,[3] and 26 passenger car configurations[4] meet 2020 or later GHG standards with a conventional gasoline powertrain. An additional 78 model variants comprised of hybrid electric vehicles (HEVs), PHEVs, and BEVs also meet the 2020 or later standards.

PM and Criteria Pollutant Emission Control Technology Developments

- In response largely to the ZEV regulation, manufacturers have been marketing passenger cars and SUVs meeting the 2025 LEV III criteria pollutant fleet average requirement of super ultra-low emissions vehicles (SULEV30) for over a decade. Sixteen manufacturers certified 74 vehicle models to the SULEV30 standards in 2016, including mainstream models like the Honda Civic, Chevrolet Impala, Nissan Altima, and Jeep Cherokee. The technology to meet this stringent requirement is well defined and manufacturers have significant lead time to incorporate it across their fleets.
- Testing data confirms that newer gasoline direct injection (GDI) vehicles have significantly lower PM emissions than earlier generation GDI vehicles and are readily capable today of meeting the upcoming 3 mg/mi standard with typical emission rates from 1.2-1.5 mg/mi.
- These significant advances in PM control from GDI engines position manufacturers well to make the final refinements in control towards the 1 mg/mi PM standard.

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[1] EPA 2015a. 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. https://nepis.epa.gov/Exe/ZyPDF.cgi/P100O5TH.PDF?Dockey=P100O5TH.PDF

[2] Some variants of the F-150 meet the 2024 GHG standards while some variants of the Ram 1500 and the Chevrolet Silverado meet the 2021 GHG standards

[3] Such as the Subaru Outback, the Nissan Rogue, and the Honda CR-V. Includes minivans and station wagons classified as trucks.

[4] Such as the Mazda 6, the Hyundai Sonata, and the Honda Civic

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ZEV Technology Developments

- Through August 2016, nearly 230,000 ZEVs and PHEVs have been registered in California, with an additional 62,000 in nine Section 177 states that have adopted California's ZEV regulation. These contribute towards the more than half a million ZEVs and PHEVs in the U.S. and the expected 2 million ZEVs and PHEVs around the world by year's end.
- Battery technology has improved and battery costs (as well as other component costs) have fallen dramatically (largely due to reduced material costs, manufacturing improvements, and higher manufacturing volumes), leading to an increase from 25 PHEV and BEV models offered today to manufacturer announcements of more than 70 unique models to be released over the next 5 model years.
- ZEV electric infrastructure in California and Section 177 ZEV states has grown with substantial investments in the past several years, and accelerated investments are expected as new infrastructure developments emerge. Over 17,000 Level 2 and 2,100 direct current fast charger (DCFC) connectors have been deployed across California and the nine Section 177 ZEV states.
- California's current programs enabled by important legislation (most prominently Assembly Bill 8[5]) are launching the first major FCEV market and hydrogen fueling network in the U.S. Three FCEVs are currently for sale in California while 25 retail hydrogen refueling stations are open in California with an additional 20 stations already in development. Toyota and Honda have also announced partnerships with private companies for financial support of additional stations in California and the Northeast.

This summary report and its 13 appendices encompass ARB's technical analysis for the midterm review of the adopted LEV III GHG and PM emission standards and ZEV requirements. The findings from this analysis support the following recommendations.

Findings and Recommendations:

2022 through 2025 model year GHG emission standards

Continue California participation in the National Program by maintaining the "deemed to comply" provision allowing for compliance with the adopted U.S. EPA GHG standards for 2022 through 2025 model years. The extensive multi-year joint-agency work summarized in the draft 2016 Technical Assessment Report (2016 TAR) showed clearly that the current national 2022 through 2025 model year GHG 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. The 2016 TAR analysis did not include several other new advanced vehicle technologies being introduced by vehicle manufacturers in the next few years that may provide significant benefits at similar or lower costs. Accordingly, after consideration of public comments received on the 2016 TAR, U.S. EPA released a Proposed Determination for public comment on November 30, 2016 that the national GHG standards currently in place for 2022-2025 model years remain appropriate under

[5] Assembly Bill No. 8 (Perea, Statutes of 2013, Chapter 401)

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the Clean Air Act and do not need to be amended. After considering additional public comments received on the Proposed Determination, U.S. EPA released a Final Determination on January 13, 2017 affirming that the national GHG standards for 2022-2025 model years would remain as adopted.

The updated national vehicle forecast shows that changes in vehicle fleet composition due to increased truck sales are now projected to result in a slightly higher 2025 model year fleet average CO_2 level. Similarly updated analysis for California, however, found that the originally projected California GHG benefits will still be achieved. An analysis specific to the California car/truck fleet mix projects the 2025 model year fleet average to be the same or lower than originally projected. Despite a similar trend as seen nationally in increased truck sales, the updated analysis projects the equivalent CO2 fleet average in California will be between 153 and 167 grams per mile CO2 compared to the original 2012 ARB projection of 166 grams CO_2 per mile, largely due to the actual share of passenger cars in the fleet mix being much higher than originally estimated. As such, the deemed-to-comply provision adopted by ARB to allow compliance with national GHG standards that preserved the GHG-reduction benefits of the California-specific GHG standards still puts California on track to achieve the projected GHG reductions from the 2025 model year fleet. 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.

These findings on the benefits to California are based on an analysis assuming the existing national GHG standards. If the stringency of the national GHG standards were substantially changed, despite the Final Determination by U.S. EPA based on a comprehensive record demonstrating that the existing standards should be maintained, these findings would likely be different. In that event, California could revisit whether it would have to conduct a new analysis to determine whether compliance with a new National Program would be an appropriate approach under California's LEV III program to address California's unique air quality challenges and its mandates to achieve aggressive GHG reductions to protect public health and the environment.

<u>1 milligram per mile particulate matter emission standard</u>

As previously reported to the Board in 2015, maintain the existing PM emission gravimetric measurement method for the 1 mg/mi standard. In responding to Board direction regarding examination of the tailpipe emission measurement capability at 1 mg/mi PM levels, staff reported to the Board in October 2015 that the gravimetric method for determining PM emissions is appropriate for measuring low PM emission levels and that the method will remain the approved procedure for determination of compliance with ARB's LEV III PM emission standards. This decision was based on extensive emission testing and research of

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laboratory methods conducted by ARB and published in the peer-reviewed literature.[6] The agency's research was conclusive with respect to the applicability of the gravimetric method, but also included several PM measurement alternatives such as counting particles and, while the work showed that none of the alternatives were equivalent to the current gravimetric method of determining PM mass, it revealed some potential benefits of several of the alternatives. Thus, the agency is committed to track further developments to ensure ARB's measurement capabilities remain at the forefront of PM emission metrology and technology.

Maintain the stringency and implementation schedule of the adopted 1 mg/mi PM emission standard applicable in 2025 model year. To respond to the Board's additional direction regarding reassessing stringency and implementation of the 1 mg/mi PM standard, additional emission testing and a review of vehicle PM emission control technology was conducted and is included in this report (Appendices J and K). This work determined that compliance with the 1 mg/mi emission standard by 2025 model year is feasible and that manufacturers are on track to meet this standard. The findings also support that the currently provided lead time is necessary to ensure manufacturers can incorporate broadly the knowledge gained from the in-use operation of newer, 3 mg/mi compliant, GDI systems into normally scheduled engine redesigns to optimize for PM control at little to no added cost. Test data and analysis shows that, although vehicle manufacturers have achieved significant PM emission reductions over the last engine redesign cycle, some are not yet controlling PM emissions well enough to consistently maintain the 1 mg/mi limit across all applicable operating conditions and over all vehicle models. In particular, further improvements are needed for gasoline direct injection (GDI) vehicles to meet a 1 mg/mi standard with a sufficient compliance margin, but manufacturers and suppliers appear to be on track to achieve control within the current lead time provided by the adopted regulation. Thus, earlier implementation than 2025 model year of the 1 mg/mi PM standard is not supported by this analysis as the reduced lead time would jeopardize the ability of manufacturers to ensure robust solutions that can be incorporated into scheduled engine redesigns and would likely lead to reliance on more costly, interim solutions such as gasoline particulate filters (GPF) to comply. On the other hand, the GPF is a viable solution, albeit at a higher cost, available to manufacturers now for meeting the most stringent 1 mg/mi PM limit.

Develop more comprehensive PM emission standards to phase-in with the 1 mg/mi standard in 2025 model year to ensure manufacturers implement robust control strategies that result in low PM emissions in the real world. The most recent set of emission test results suggests that additional regulatory requirements are needed to better ensure that when the 1 mg/mi Federal Test Procedure (FTP) standard is phased-in, it results in robust in-use PM control over a broader spectrum of driving conditions than encountered in the FTP. To this end, ARB plans to develop a more stringent US06 cycle PM emission standard, which would verify PM is well-controlled over more aggressive in-use driving conditions, as well as consider PM emission standards for other test cycles and ambient conditions as necessary to ensure in-use PM emissions are minimized.

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[6] ARB 2015a. California Air Resources Board. "An Update on the Measurement of PM Emissions at LEV III Levels". October 2015. https://www.arb.ca.gov/msprog/levprog/leviii/lev_iii_pm_measurement_feasibility_tsd_20151008.pdf

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California's ZEV regulation

Strengthen the ZEV program for 2026 and subsequent model years to continue on the path towards meeting California's 2030 and later climate change and air quality targets. Set new requirements to target credit provisions and regulatory structure adjustments in order to increase certainty on future vehicle volumes, technology improvement, and PHEV qualifications and other factors to maximize GHG and criteria pollutant reductions. For the first time since the initial adoption of the regulation, the Board adopted increased ZEV credit requirements in 2012. This action, in concert with the development of strong comprehensive complementary policies to support infrastructure deployment and consumer awareness, led to the advancement of ZEV technology and growth in ZEV sales. Since the adoption of the 2018 through 2025 model year standards, manufacturers have been exceeding the annual requirements of the ZEV regulation and expanding the market nationwide by delivering ZEVs and PHEVs in states which have not adopted California's ZEV regulation. Thus, committing now to a strong set of post-2025 requirements reinforces current progress and encourages manufacturers to continue advancements to electrify their fleets.

Modeling to meet the 2030 GHG targets established by SB 32 in the ARB Mobile Source Strategy report, released in May 2016, indicates approximately three million additional ZEVs and PHEVs will be needed in 2026 through 2030. To reach these volumes with any certainty, the new regulation will need modifications that provide a more direct connection to vehicle volumes and require vehicle characteristics that best ensure market success. For such significant revisions to the regulation to be successful, however, it would require greater market acceptance, more technology advancements, and lower technology costs than is known with certainty today. In PHEVs alone, the product offerings and architecture variations are increasing in diversity and it is too early to determine which combinations will be appealing to consumers while providing maximum GHG and criteria pollutant benefits. For BEVs, a step change is occurring with multiple offerings expected with 200+ miles of range at prices closer to mainstream conventional vehicles (even before state and federal incentives), with the first of these being launched within weeks of this report's release. Additionally, substantial changes to the regulatory structure will impact vehicle manufacturer product and compliance planning and necessitate sufficient lead time and stability to implement successfully while minimizing disruption to research, investment, and design cycles. Development of future new ZEV requirements needs to be done in concert with additional GHG (and potentially criteria pollutant) fleet-wide emission reduction requirements as was previously done in the 2012 ACC program. This coordinated approach ensures the regulations of multiple pollutants benefit from the synergistic effects and result in a single integrated policy to help meet California's air quality and GHG goals. To this end, ARB intends to continue to collaborate on a technical basis with its federal partners such as the U.S. Department of Energy (DOE), U.S. EPA, and NHTSA to research, develop, and promote advancement of vehicle technologies including ZEV technologies necessary for California's long term goals.

Maintain the current ZEV stringency for California through 2025 model year including the existing regulatory and credit structure. In 2012, the Board strengthened the ZEV regulation, nearly tripling the credit requirements for pure ZEVs in 2025 model year, and shifting

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away from a stair-step approach (where requirements remained the same for three years at a time) to a simpler, linear annual increase in the requirements. Since then, the regulation has been achieving the goal of accelerating development of ZEV technology towards commercialization in California as demonstrated by the clear growth in the ZEV market, the introduction of more capable and longer range vehicles than originally projected, and earlier reduction in battery costs than anticipated. The 2012 Board action has resulted in over 215,000 ZEVs and PHEVs being placed in California over the last five years and an expansion from 25 models offered today to over 70 unique ZEV and PHEV models expected in the next five years. As a result of the vehicle technology advancements evident in the market, new minimum compliance scenarios were developed that project approximately 1.2 million cumulative sales of ZEVs and PHEVs by 2025 in California. While this revised compliance picture reflects a lower volume of vehicles than originally projected in 2012, the resultant improvements in ZEV and PHEV attributes, such as all-electric range and vehicle price, are expected to further broaden the appeal of these vehicles beyond the initial consumers and help achieve necessary future market expansion. Simply put, the market is seeing the introduction of better ZEVs. Outside of California, ZEV markets are expanding in the U.S. as well as globally, indicating that the industry is beginning a significant shift towards greater electrification.

Despite these successes, it is widely recognized that the ZEV and PHEV market is still in the early stages of development. While the market is rapidly changing with nine BEV and PHEV models already discontinued since their introduction, it is also unknown how many of the 70 announced models will succeed in the market. The current market has benefited from multiple purchase incentives that have substantially discounted ZEVs and PHEVs such that their prices are more aligned with those of conventional vehicles. But, between 2018 and 2025, these and other incentives are expected to phase out. While decreased reliance on incentives is essential for building a self-sustaining market, it is unclear what consumer response will be without purchase and other incentives (like high occupancy vehicle (HOV) lane access). Consumer awareness of ZEVs is still low and top motivations like saving money on fuel are less influential as gasoline prices remain low. Given the market uncertainties that still exist in these early years, regulatory stability of the 2018 through 2025 model year standards can help ensure a continued path of increasing, but achievable, ZEV volumes.

Maintain the existing flexibilities, including as amended in 2014, for intermediate volume manufacturers (IVMs). Regarding the ZEV requirements applicable to IVMs, this analysis found that a further reduction in the requirements is not warranted at this time. The Board adopted a number of flexibilities in the original rulemaking in 2012 and in an additional rulemaking in 2014 to help ease the transition of the IVMs into the more stringent requirements starting in model year 2018. While smaller than other manufacturers, to their credit, these manufacturers do have competitive products in the market and generally agree that there is a need to develop and introduce ZEV technologies to remain competitive into the future. All five current IVMs have clear and concrete plans to bring ZEVs to market in the next few years, with relevant announcements for two of the five as recently as November 2016. Additionally, as shown in the revised compliance scenario analysis, there are sufficient credits, both in their own banks and in the market, available for IVMs to help bridge any interim compliance gaps.

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Maintain the existing credit structure and use caps for PHEVs through the 2025 model year. PHEVs will continue to play a role in the electrification of transportation for long-term emission reduction targets. The adopted standards are consistent with ARB's long-term modeling scenarios and already recognize PHEVs not only can help consumers and manufacturers transition to pure ZEVs but that they also can continue to be a significant share of the vehicle market. Based on in-use data from PHEVs, emission testing, and analysis of electric use conducted by ARB, PHEVs can generate significant benefits over conventional vehicles but do not generally result in GHG or criteria pollutant emission reductions equal to pure ZEVs. Given this and even more importantly, the technology-forcing goals of the ZEV regulation, the current regulation appropriately awards more credits to the longer range pure ZEV vehicles.

Further, as shown in the updated compliance scenarios, PHEVs are projected to make up more than 60 percent of all ZEVs and PHEVs on the road by 2025 even with the current use caps on PHEV credits. This indicates the current regulatory structure already provides sufficient flexibility as the ZEV market is developing to determine the role PHEVs will ultimately play. The new analysis does not support more flexibility for PHEVs at this time such as allowing manufacturers to comply with ZEV requirements with more PHEVs than currently allowed. And, while strong electric drive capability PHEVs with significant all-electric range and minimal engine starts are very encouraging, the analysis in this report finds that their benefits do not match or exceed those of pure ZEVs and, hence, PHEVs are appropriately credited less than pure ZEVs in the existing regulation. Furthermore, allowing for more credits per PHEV such that fewer total vehicles are needed to comply does not result in additional emission benefits or furtherance of the technology-forcing goals of the ZEV regulation.

Continue efforts by ARB and other stakeholders to accelerate and expand non-regulatory complementary policies that have been identified as successful in building market demand and removing remaining barriers to ZEV adoption. Irrespective of any regulatory action, appropriate complementary policies will need to be in place to support the expansion of the ZEV market as the market share will need, at a minimum, to approximately triple in the next nine years. ARB and other stakeholders will need to accelerate and expand non-regulatory and complementary actions that have been identified as successful to continue to enhance market demand for ZEVs and remove the remaining barriers to ZEV adoption. Examples of such policies include consumer rebates and tax credits, carpool lane access, availability of public charging infrastructure, parking incentives, and others.

<u>ZEV regulation requirement for Section 177 ZEV states</u>

Maintain the adopted flexibilities for the Section 177 ZEV states. Through Section 177 of the Clean Air Act, several states have previously adopted various California vehicle regulations to help achieve their air quality or GHG targets. In particular, nine states have adopted California's ZEV regulation, collectively requiring that 25 percent to 30 percent of all new vehicles sold in the U.S. be subject to ZEV regulation requirements. California and its Section 177 ZEV state partners have embraced a strong collaboration for supporting ZEVs, entering into

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a multi-state Memorandum of Understanding (MOU) in 2013 to help facilitate successful market development especially in the areas of non-regulatory complementary policies.

Recognizing the market development in the Section 177 ZEV states was not yet as far along as California's, the Board adopted additional regulatory flexibilities and lead time to create a ramp into the 2018 and subsequent model year requirements for the states. Despite current lower sales in the Section 177 ZEV states, increased product offerings coming for the states, expiration of regulatory flexibilities that may have discouraged past sales efforts in the states, and more comprehensive complementary policies provide sufficient support for manufacturers to meet the increasingly stringent ZEV requirements in the Section 177 ZEV states. Additionally, credits both created in the Section 177 ZEV states and generated through the travel provision in the California market will help manufacturers who need more time to build a market for their vehicles between 2018 and 2025 model years.

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Summary Report: California's Mid-term Review of the Adopted LEV III GHG, PM, and ZEV Standards

Introduction

What is the Advanced Clean Cars program?

In 2012, the California Air Resources Board (ARB) adopted the Advanced Clean Cars (ACC) program, a comprehensive set of standards for new vehicles in California through model year 2025. This historic program, developed in coordination with the United States (U.S.) Environmental Protection Agency (EPA) and National Highway Traffic Safety Administration (NHTSA), combined the control of smog-causing (criteria) pollutants and greenhouse gas (GHG) emissions into a single coordinated set of requirements for model years 2015 through 2025 and assured the development of environmentally superior passenger cars and other vehicles that will continue to deliver the performance, utility, and safety vehicle owners have come to expect all while saving the consumer money through significant fuel savings. The components of the ACC program are the Low-Emission Vehicle III (LEV III) regulations that reduce criteria pollutants and GHG emissions from light- and medium-duty vehicles and the zero-emission vehicle (ZEV) regulation, which requires manufacturers to produce an increasing number of pure ZEVs (meaning battery electric and fuel cell electric vehicles) and plug-in hybrid electric vehicles (PHEV) in the 2018 through 2025 model years. When fully implemented, new vehicles are expected to emit 34 percent fewer GHG emissions and 75 percent fewer smog-forming emissions than today's vehicles.

Vehicles and transportation fuels are the dominant sources of carbon emissions in California. ACC is an integral part of California's ambitious long-term requirements to reduce the State's impact on climate change and improve ambient air quality. The vehicle programs are a critical measure in the State Implementation Plan[7] (SIP) for achieving national ambient air quality standards in the South Coast and San Joaquin Valley. They are also an integral part in ARB's Scoping Plan to achieve the GHG reduction goals that were established through California legislation and Executive Orders.[8] This year, GHG reduction targets in Executive Order B-30-15 were codified with the passage of Senate Bill (SB) 32 (Statutes 2016, Chapter 249, Pavley), which expanded the California Global Warming Solutions Act of 2006, by directing ARB to ensure that statewide GHG emissions are reduced to at least 40 percent below the 1990 level by 2030. Also in 2016 California enacted Assembly Bill (AB) 197 (Statutes 2016, Chapter 250, Garcia). AB 197, among other provisions, declares that continuing to reduce GHG emissions is critical for the protection of all areas of the state, but especially for the state's most vulnerable

[7] ARB 2016a. California Air Resources Board. Proposed 2016 State Strategy for the State Implementation Plan. May 17, 2016. https://www.arb.ca.gov/planning/sip/2016sip/2016statesip.pdf

[8] Executive Orders S-3-05 (Schwarzenegger, 2005) and B-30-15 (Brown, 2015) establish long term GHG emission reductions of the state of 80% and 40% below 1990 levels by 2050 and 2030 (respectively).

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communities, as those communities are affected first, and most frequently, by adverse impacts of climate change.

Although significant strides have been made toward improving California's air quality, health-based state and federal ambient air quality standards continue to be exceeded in major regions throughout California. To achieve the 1997 8-hr ozone standard by the attainment date in 2023, oxides of nitrogen (NOx) emissions in the greater Los Angeles region must be reduced by an additional two thirds beyond reductions from all of the control measures in place today. Furthermore, to achieve the more stringent 75 parts per billion (ppb) 2008 8-hr ozone standard by 2031 will require an 80 percent reduction in NOx from 2012 levels. ARB is working with the local air quality management districts to prepare SIPs informed by ARB's Mobile Source Strategy.[9] The plans for attaining the most recently adopted 70 ppb ozone standard have not begun, but are expected to have to rely heavily on significant and on-going progress towards zero and near-zero mobile source emissions in California. The third generation "LEV III" regulations, adopted as part of the ACC program, build upon the requirements of the earlier LEV regulations and continue to reduce emissions from the light- and medium-duty fleet through the 2025 model year.

What is the midterm review (MTR), and how is California's review different from the joint-agency national midterm evaluation?

The primary differences between state and federal actions are in the scope of the different reviews. While the national midterm evaluation was solely focused on a review of the federal GHG (and associated fuel economy) standards, ARB's MTR is required to review California's PM standard and ZEV regulation in addition to a review of the GHG standards. When adopting the current ACC program standards, the Board committed to participating in a joint-agency review with U.S. EPA and NHTSA of the 2022 through 2025 model year GHG tailpipe standards, first in a letter written the summer before the rulemaking,[10] and later when adopting the ACC standards in its January 2012 Resolution.[11] The Board also directed staff to conduct reviews specific to the California standards: the ZEV regulation, the 1 mg/mi particulate matter (PM) emission limit, and a general technical review relative to the format of the adopted GHG standards, the use of vehicle footprint as a key attribute, and reliance on the federal corporate average fuel economy or CAFE car/truck definitions. The Board also directed staff to return with its review no later than December 2016. Resolution 12-11 specified areas for staff to consider for its review as shown in Table 1 below.

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[9] ARB 2016b. California Air Resources Board. ARB Mobile Source Strategy. May 2016. https://www.arb.ca.gov/planning/sip/2016sip/2016mobsrc.pdf

[10] Nichols, 2011. Chairman Mary Nichols (California Air Resources Board.) Commitment Letter. July 2011.

[11] ARB 2012a. California Air Resources Board. Resolution 12-11. Available: http://www.arb.ca.gov/regact/2012/zev2012/res12-11.pdf, Accessed August 24, 2016

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Table 1 - 2012 Advanced Clean Cars Resolution Direction

Program	*Board Resolution Direction*
GHG	Participate in a midterm review with the U.S. EPA and NHTSA of the federal passenger vehicle GHG standards and corporate average fuel economy (CAFE) standards for the 2022 through 2025 model years
	Continue collaboration with U.S. EPA and NHTSA during finalization and review of the federal standards to minimize potential lost GHG benefits from differences in how upstream emissions for electricity and hydrogen fueled vehicles are accounted for in the federal standards as compared to the California regulation
	Monitor consumer purchasing trends and California's fleet mix to evaluate any effect of a potential shift in vehicle footprint to larger and more polluting vehicles and the reclassification of cars as trucks that deviates from the fleet size and category mix projected in the approved amendments
PM	Re-examine the measurement methods, stringency, and timing of the adopted 2025 model year 1 mg/mi PM emission standard
ZEV	Monitor consumer acceptance of PHEVs and report on expected volumes in the ZEV program
	Analyze in-use data for range extended battery electric vehicles (BEVx) and PHEVs, and propose appropriate modifications as needed
	Conduct a study of the potential effects of adding an additional category of vehicles to the ZEV regulation for "BEV XX" vehicles that would be allowed greater use of an internal combustion engine than allowed for vehicles approved as "BEV X" vehicles in this action, where such BEX XX vehicles would only be applied to 25 percent of a manufacturer's pure ZEV requirement

In addition to the above Resolution direction, staff also monitored the evolution of the ZEV market and evaluated the effectiveness of the ZEV regulation as adopted in 2012, both in California and in the other states that have adopted California's ZEV regulation. Staff received additional direction at the July 2016 Board Hearing to examine the ZEV credit banks, the treatment of credits for ZEVs and PHEVs within the regulation, and to explore ways to ensure that the market is growing in the appropriate timeframe to meet the long-term air quality and GHG emission reduction goals expressed in the regulation.[12]

What was the review process of the ACC program?

Extensive Consultation with Stakeholders

Over the past four years, staff has held numerous and extensive consultation sessions and technical discussions with experts representing all of the major automakers and other leading technical stakeholder groups with an interest in the ACC standards on each of the three aspects of ARB's midterm review. These discussions involved consideration of auto manufacturer market plans for technology development and examination of the most recent and relevant evidence concerning trends for technology and costs as noted in the 2016 TAR. In 2015, ARB

[12] ARB 2016c. California Air Resources Board. July 2016 Board Transcript. July 21, 2016 http://www.arb.ca.gov/board/mt/2016/mt072116.pdf

participated in systematic joint-agency (along with U.S. EPA and NHTSA) discussions with manufacturers regarding the evaluation of the GHG standards, which fed into the 2016 TAR described below. In 2016, ARB held separate discussions with most manufacturers to consider confidential business approaches for upcoming product and compliance plans for the ZEV and PM reviews.

Extramural Research

Research for generation of new knowledge is a key aspect of the agency analysis in support of this MTR. ARB has sponsored or co-sponsored six extramural research projects to support the mid-term review. Three projects have been completed to date. These projects, along with a short description are listed in Table 2 below.

Table 2 - Advanced Clean Cars Midterm Review Extramural Research Projects

Research Contract Title	Author	Project Status
Technical Analysis of Vehicle Load-Reduction Potential for Advanced Clean Cars[13]	Gregory Pannone, Control Tec (now Novation Analytics)	Complete
New Car Buyer's Valuation of Zero-Emission Vehicles[14]	Dr. Kenneth Kurani, University of California, Davis	Complete
Very low PM measurements for light-duty vehicles (E-99)	Dr. Heejung Jung, University of California, Riverside	Complete
The dynamics of plug-in electric vehicles in the secondary market and their implications for vehicle demand, durability, and emissions	Dr. Gil Tal, University of California, Davis	On-going
Examining Factors that Influence ZEV Sales in California	Dr. J.R. DeShazo, University of California, Los Angeles	On-going
Advanced Plug-In Electric Vehicle Usage and Charging Behavior	Dr. Tom Turrentine, University of California, Davis	On-going

Research findings from the "Technical Analysis of Vehicle Load-Reduction Potential for Advanced Clean Cars" and "New Car Buyer's Valuation of Zero-Emission Vehicles" have been presented and published. These seminars are webcast and archived.[15] Completion of the remaining projects is underway and ARB expects to make use of those findings in subsequent technical analyses, including those informing new post-2025 regulatory policies.

Annual Board Informational Updates

Beginning in October 2013, staff provided three annual informational updates on the ACC program to the Board, each emphasizing different aspects of staff's review.[16] Staff's 2013 update focused on the general plan for the conduct of the midterm review, as well as various complementary policies and initiatives. The 2014 update related an in-depth examination of

[13] Pannone 2015. Pannone, G., *Technical Analysis of Vehicle Load-Reduction Potential for Advanced Clean Cars.* Contract 13-313. Control-Tec, LLC. 2015. http://www.arb.ca.gov/research/apr/past/13-313.pdf

[14] Kurani 2016. Kurani, K. *New Car Buyers Valuation of Zero Emission Vehicles.* Contract 12-332. University of California, Davis. 2016. https://www.arb.ca.gov/research/apr/past/12-332.pdf

[15] Access all archived research seminar webinars: https://www.arb.ca.gov/research/seminars/seminars.htm

[16] Staff's annual updates can be accessed at the following link: https://www.arb.ca.gov/msprog/acc/acc-mtr.htm

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charging and fueling infrastructure needs, development of charging and fueling infrastructure networks in California, and provided detailed information about other on-going studies and research related to this MTR. In 2015, the first part of the PM review was presented to the Board on the topic of PM emission measurement feasibility and general laboratory practices. Additionally, staff presented information on consumer purchasing attitudes regarding ZEVs and PHEVs.

The Joint-Agency Draft 2016 Technical Assessment Report
The results of an extensive multi-year study are presented in the recently published 2016 *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* (referred to as the 2016 TAR throughout this report).[17] The 2016 TAR represents the culmination of new technology assessments, vehicle emission testing, and modeling work and updated analyses of the feasibility, costs and potential pathways to meeting the adopted national GHG standards for model years 2022 to 2025. In the development of the 2016 TAR, the three agencies drew from multiple sources of information ranging from stakeholders such as vehicle manufacturers and vehicle component suppliers to extensive in-house research at U.S. EPA's National Vehicle and Fuel Emissions Laboratory. ARB staff provided an overview of the information presented in the 2016 TAR at the July Board Hearing.

Advanced Clean Cars Symposium: The Road Ahead
In September, 2016 ARB held a two-day technical ACC Symposium "The Road Ahead" in Diamond Bar, California at the South Coast Air Quality Management District headquarters.[18] Over 100 participants and agency staff attended the symposium over the two days, and more participated via webcast. The first day featured presentations made by representatives from industry and academia on various groundbreaking trends in ZEV technologies, including the latest in battery technology, wireless charging, and ARB's analysis of manufacturer provided plug-in electric vehicles (PEV) in use data and emissions testing of PHEVs. The second day 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 and could help meet the adopted GHG and PM standards.

California's Final Report – The Midterm Review of the Adopted Standards
This report is a compilation of four years of staff work on each aspect of the midterm review. The thirteen appendices (labeled A through M) attached to this summary document will present the staff analyses:

[17] EPA 2016. U.S. EPA, NHTSA, ARB. July 2016. 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. July 2016. https://nepis.epa.gov/Exe/ZyPDF.cgi/P100OXEO.PDF?Dockey=P100OXEO.PDF
[18] Agendas and presentations made at the September 26 and 27 Symposium are found here: https://www.arb.ca.gov/msprog/acc/acc-symposium.htm

A. Analysis of Zero Emission Vehicle Regulation Compliance Scenarios

Analysis of ZEV regulation compliance scenarios with updated inputs, ZEV calculator, and credit bank analysis.

B. Consumer Acceptance of Zero Emission Vehicles and Plug-in Hybrid Electric Vehicles

Analysis of California and Section 177 ZEV state ZEV and PHEV market development since the adoption of ACC, as well as a look at the potential for further market growth.

C. Zero Emission Vehicle and Plug-in Hybrid Electric Vehicle Technology Assessment

A review of the current status of ZEVs (both BEV and FCEV) and PHEV technology trends and summary of incremental vehicle costs.

D. Zero Emission Vehicle Infrastructure Status in California and Section 177 ZEV States

A review of the current status, station counts, technology trends, and costs of charging and hydrogen fueling infrastructure in California and Section 177 ZEV states.

E. Zero Emission Vehicle Complementary Policies in California and Section 177 ZEV States

A summary of complementary policies (apart from those covered under Appendix D) that are helping to spur the ZEV market in California and the Section 177 ZEV states.

F. Scenario Planning: Evaluating impact of varying plug-in hybrid electric vehicle (PHEV) assumptions on emissions

Analysis of sensitivities for increased electric vehicle miles traveled (eVMT), increased on-road PHEV numbers, and increased fuel economy on ARB's latest long-term emissions reduction plans presented earlier in 2016 in the Mobile Source Strategy.

G. Plug-in Electric Vehicle In-Use and Charging Data Analysis

Analysis of manufacturer provided driving and charging data from eleven different PEV models.

H. Plug-in Hybrid Electric Vehicle Emissions Testing

Description and summary of testing completed in ARB's Haagen-Smit Laboratory on blended PHEVs to analyze criteria pollutant emissions.

I. Alternative Credits for Zero Emission Vehicles and Plug-in Hybrid Electric Vehicles

In accordance with the Board's 2012 resolution, a summary of various alternative ZEV regulation credit structures based on data from Appendix G.

J. Vehicle PM Emission Control Technology Assessment

Assessment of currently available PM emission control technologies, which could be employed on gasoline vehicles to meet the 1 mg/mi standard.

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K. PM Emission Testing Results

Description and summary of results from testing at ARB's Haagen-Smit Laboratory of vehicles with advanced gasoline GHG technologies and their ability to comply with the 1 mg/mi PM standard.

L. Emissions Impact Assessment for the 1 mg/mi standard

Background of the PM emission standard and updated emissions inventory analysis for implementing the 1 mg/mi PM standard earlier than in model year 2025.

M. California GHG technology trends

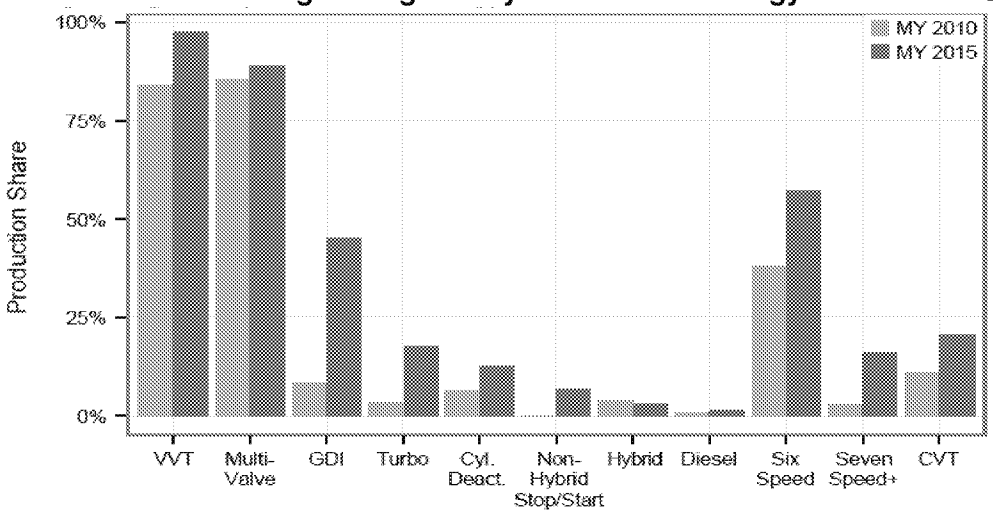
Analysis of trends in the California's light-duty vehicle (LDV) fleet to assess the car/truck split and vehicle footprint effects since the adoption of the ACC regulations.

Greenhouse Gas Emission Standard Review

How have conventional vehicle technologies progressed since the adoption in 2012 of the GHG fleet average standards?

Since adoption of the GHG and fuel economy standards in 2012, manufacturers have employed a variety of technologies that reduce GHG emissions and increase fuel efficiency, many at a faster rate of deployment than was originally projected. According to U.S. EPA's 2015 trends report (Trends Report),[19] large changes in advanced engine and transmission penetration rates have taken place across the industry in the last five years, as shown in Figure 1. As expected, the penetration rate for individual technologies varies between manufacturers.

Figure 1 - Five Year Change in Light-Duty Vehicle Technology Penetration Share



Source: U.S. EPA's *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2015 Trends Report*

[19] EPA 2015b. United States Environmental Protection Agency. *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2015 Trends Report* November 2015. https://www.epa.gov/fuel-economy/download-co2-and-fuel-economy-trends-report-1975-2015

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What were the main findings of the 2016 TAR?

Independent and parallel analyses were conducted by U.S. EPA and NHTSA, with some input from ARB, thereby resulting in complementary conclusions and identifying multiple possible pathways to comply with the 2022 through 2025 model year GHG and augural fuel economy standards. In support of these analyses, information from multiple sources was used such as new vehicle certifications, full vehicle simulation modeling conducted by the agencies, extensive reviews of the published technical literature and technical conference information, vehicle manufacturer and supplier information and focused discussions, and the 2015 National Academy of Science report "Cost, Effectiveness and Deployment of Fuel Economy Technologies for Light-Duty Vehicles."[20] In general, the analyses confirm that the original estimates of the effectiveness of technologies in terms of efficiency and GHG performance examined in the 2012 Final Rulemaking (FRM) remain appropriate.

Technology Penetration

The agencies found the 2025 model year GHG standards can be met at approximately the same or lower cost, predominantly with advanced gasoline engines and transmissions. Light-weighting, improved aerodynamics, and better tires also provide additional GHG reductions. As shown in Table 3, compliance with the national standards is not expected to prompt automakers to rely on large quantities of ZEVs, PHEVs, or conventional hybrid electric vehicles (HEV). Increased use of such technologies would enable additional GHG emissions reductions but it would also increase projected vehicle costs.

Table 3 - 2025 Model Year Vehicle Technology Fleet Penetrations

2025 Model Year Vehicle Technologies		
	U.S. EPA Analysis	**NHTSA Analysis**
Turbocharged and Downsized Gasoline Engines	33%	54%
Higher Compression Ratio, Naturally Aspirated Gasoline Engines	44%	<1%
8 speed and other Advanced Transmissions	90%	70%
Mass Reduction	7%	6%
Stop-Start	20%	38%
Mild Hybrid (48 Volt)	18%	14%
Full Hybrid	<3%	14%
Plug-in Hybrid Electric Vehicle*	<2%	<1%
Battery Electric Vehicle*	<3%	<2%

* U.S. EPA's modeling includes compliance with ZEV regulatory requirements in the reference fleet. Consequently, 3.5% of the fleet is projected to be an electric vehicle or a plug-in hybrid electric vehicle in the 2022 through 2025 model year timeframe due to the adoption of the ZEV regulations in California and Section 177 ZEV states. The NHTSA modeling does not include ZEV regulatory compliance in the reference fleet.

[20] NRC 2015. National Research Council. Effectiveness and Deployment of Fuel Economy Technologies for Light-Duty Vehicles June 18, 2015.

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Projected Vehicle Fleet Mix and Associated Emission Benefits

Additional key findings in the 2016 TAR relate to projected benefits and costs. The new analysis relies on updated assumptions of the mix of cars and trucks, which show that nationwide, people are purchasing more trucks and fewer cars than was projected in the 2012 Final Rule of the national program. The future projection of vehicle fleet mix is based on the U.S. Energy Information Administration's 2015 Annual Energy Outlook (AEO) that factors in projected fuel prices with current trends and regulatory requirements. Because trucks are required to meet higher (less stringent) CO_2 standards than cars, the updated projected national fleet average for the 2025 model year is 175 grams per mile versus the original 163 grams per mile projection in the national standard. The corresponding projected fuel economy is 50.8 mpg nationally instead of 54.5 mpg. These updated projections assume that the stringency of the 2022 through 2025 model year GHG standards does not change.

Table 4 - 2025 Model Year Projected National Fleet Mix

MY 2025 Fleet Mix	Original Projection	New Projection
% Car	67%	52%
% Truck	33%	48%
Combined gCO_2e/mi	163	175
Combined mpg	54.5	50.8

Incremental Vehicle Costs and Payback Period

Finally, the 2016 TAR and the updated analysis used for the Final Determination project that the average incremental cost per vehicle to comply with the GHG standards in model year 2025 will be about the same or lower than the original projections used in the rulemaking. The payback period, however, has increased relative to the original estimate. This is because current and future fuel prices, as forecast by the 2015 and 2016 AEO, are lower now than what was projected back in 2012 during the original rulemaking. The revised longer estimate for the payback period is still well within the lifetime of the vehicle and operation of the vehicle beyond the payback period will result in additional consumer savings in the form of lower fueling costs.

Table 5 - 2025 Model Year Incremental Vehicle Costs and Payback Period

	Incremental Cost* per Vehicle in MY 2025	Payback Period
2012 Rulemaking	$ 1,163	3.2 years
2016 TAR:		
U.S. EPA Analysis	$ 910	5 years
NHTSA Analysis	$ 1,148	6 years
2016 Final Determination	$ 875	5 years

* All values adjusted to 2015$ per the United States Department of Labor Consumer Price Index inflation calculator. For reference, the 2012 rulemaking reported $1,070 (in 2010$) and the 2016 TAR reported $894 and $1,128 (in 2013$) for the U.S. EPA and NHTSA analysis, respectively.

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What comments were submitted by stakeholders during the federal midterm evaluation?

On July 27, 2016, a "Notice of Availability of Midterm Evaluation Draft Technical Assessment Report for Model Year 2022–2025 Light-Duty Vehicle GHG Emissions and CAFE Standards" was published in the *Federal Register*, opening up a 60-day comment period during which interested parties were requested to submit comments to the agencies for consideration in the proposed determination of the standards. On September 26, 2016, the public comment period for the 2016 TAR closed. Since that time, ARB has worked with the federal agencies to review and address specific comments and generally agrees with the responses in U.S. EPA's Proposed Determination that was released on November 30, 2016. Public comments for the Proposed Determination were due by December 30, 2016 and were subsequently considered by U.S. EPA before release of a Final Determination on January 13, 2017 that affirmed the existing GHG standards for 2022-2025 model years would remain as adopted. The technical comments are summarized below.

ARB received comments from the Alliance of Automobile Manufacturers, the Global Automakers as well as individual vehicle manufacturers, and component and material suppliers. Comments were also submitted by environmental organizations and fuel advocates.

The manufacturers' comments are grouped into five categories; 1) numerous flaws in the modeling approaches used by the agencies result in over-estimation of the efficiencies of the technologies evaluated, which in turn leads to under estimation of compliance costs, 2) the agencies failed to adequately address consumer acceptance and employment impacts of the requirements, 3) harmonization of regulatory requirements for the GHG and fuel economy program is needed to assure a coherent and single national program, 4) the GHG and fuel economy credit structures should be streamlined and harmonized, and 5) the 2016 TAR fails to account for the impact on costs from the California ZEV program.

The environmental organizations either supported affirmation of the standards or urged an increase in stringency. They also raised concerns regarding the different modeling approaches used by the agencies. In general, these organizations commented that they felt U.S. EPA's analysis was more appropriate than NHTSA's approach, in part because U.S. EPA used more recent engine and transmission data in the modeling and a modeling methodology that kept vehicle performance neutral as technologies were added as well as because it included compliance with ARB's ZEV regulation in the reference fleet.

The fuel advocates comments can be grouped into four main categories: 1) octane requirements for commercial fuel should be increased to enable the development and use of high efficiency internal combustion engines, with some advocating greater use of ethanol as a fuel additive, 2) flex-fuel credits should be restored, 3) the 2016 TAR fails to consider natural gas as a near-term, cost-effective approach to reducing carbon emissions, particularly for larger trucks. In addition, they argued renewable natural gas offers significant advantages over electrification in achieving life-cycle CO_2 benefits, and 4) the American Petroleum Association commented that credits and multipliers for "Advanced Technology Vehicles" should be

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eliminated since they distort the marketplace and ignore the life-cycle emissions of these technologies.

One question of particular interest to California is whether the cost of compliance with the ZEV program should be attributed to the cost of compliance with the GHG regulations. As mentioned in the footnote for Table 3, U.S. EPA's modeling includes compliance with ZEV regulatory requirements in California and the Section 177 ZEV states in the reference fleet, while the NHTSA analysis does not. By including it in the reference fleet, the U.S. EPA analysis neither includes the GHG benefits from ZEVs to lower the fleet average closer to the final standards nor includes the costs from ZEVs required by the California regulation. Inclusion of compliance with the ZEV regulation is consistent with past practice by U.S. EPA and it's "Guidelines for Preparing Economic Analyses"[21] to consider compliance with all other relevant finalized vehicle regulations when assessing the impact of any one program. The ZEV regulation exists independently from the GHG regulations. Consequently, the costs of compliance with the ZEV regulations will not change regardless of the stringency or even the existence of the national GHG regulations. It is, therefore, not appropriate to attribute ZEV regulatory compliance costs to compliance with the national GHG program. California fully accounted for compliance costs in California with the increased ZEV requirements in the economic analysis that supported the 2012 ACC rulemaking. The program also included the costs of compliance for both the LEV III criteria pollutant regulations and the LEV III GHG regulations. Likewise, the states that subsequently adopted the ZEV regulation, as allowed by Section 177 of the Clean Air Act, followed the specific requirements of their individual state to legally adopt such requirements including any relevant economic and cost analysis.

Which other advanced gasoline technologies should ARB consider that were not evaluated in the 2016 TAR?

While the 2016 TAR and updated analysis in the Proposed Determination examined a range of technologies to reduce GHG emissions, some promising technologies under development by the manufacturers were not assessed due to their late stage of development. Among these technologies are variable compression ratio engines and skip-fire cylinder deactivation. These technologies were discussed at the recent ARB "Technology Symposium, Advanced Clean Cars: The Road Ahead," held on September 27-28, 2016. ARB staff is tracking this and other technology for consideration in future clean vehicle policies.

Downsized, turbocharged gasoline direct injection engines play a prominent role in the 2016 TAR due to their significant efficiency gains over conventional non-turbocharged gasoline engines. However, the amount of boost that can be employed in a given engine design is generally limited to prevent pre-ignition under engine high load operation. While this can be mitigated through the use of cooled exhaust gas recirculation and direct injection, the governing factor in limiting boost is the fixed compression ratio inherent in conventional engine designs.

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[21] EPA 2014. National Center for Environmental Economics, Office of Policy, United States Environmental Protection Agency *Guidelines for Preparing Economic Analyses*, December 17, 2010 (updated May 2014). https://yosemite.epa.gov/ee/epa/eerm.nsf/vwAN/EE-0568-50.pdf/$file/EE-0568-50.pdf

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As a result, a compromise must be made between engine performance at low and high load operating conditions, limiting the efficiency gains offered by turbocharging.

One approach to maximizing efficiency gains from turbocharging is to vary the compression ratio. Nissan Motor Corporation has announced a new production ready 2.0 liter variable compression ratio turbocharged engine (VC-T).[22] The VC-T engine can vary its compression ratio between 8:1 (for high power) to 14:1 (for efficiency), depending on engine speed and load demand. In addition, the VC-T runs on the Atkinson cycle at all times providing additional efficiency gains relative to the conventional Otto-cycle operation. The VC-T engine also uses both port fuel injection and direct injection to control emissions during cold-start (particularly PM emissions) and maximize power. Nissan cites a 30 percent efficiency improvement for the 2.0 liter VC-T over a non-turbocharged 3.5 liter V6.

Cylinder deactivation offers efficiency improvements by reducing engine pumping losses during low load operation. Current systems are typically limited to deactivating one half of the engine's cylinders to address noise, vibration, and harshness (NVH) issues and provide up to an 8 percent improvement in engine efficiency. Tula Technology, Inc. has developed a more refined version of cylinder deactivation called Dynamic Skip Fire (DSF),[23] whereby engine cylinders can be deactivated on a continuously variable basis. The decision to fire or skip a cylinder is made before each cylinder event allowing for an immediate response to driver torque demand. The system proactively manages the engine firing sequence, maintaining benchmark NVH characteristics. Other features of the DSF include eliminating catalyst refueling penalties by completely shutting off all cylinders during deceleration, and fast torque control which reduces or eliminates spark retard during transmission shifts. Testing on a 6.2 liter V8 engine has demonstrated a 17 percent reduction in CO_2 emissions.

Variable compression ratio engines and DSF cylinder deactivation are two examples of applications which show how the automobile industry is rapidly improving the efficiency of the internal combustion engine even beyond the technologies evaluated in the 2016 TAR. These recent developments, along with technologies evaluated in the 2016 TAR, are expected to provide automakers with an ever-increasing list of options for improving vehicle efficiency in a cost effective manner, while maintaining consumer appeal and vehicle performance.

Why does ARB think that the 2022 through 2025 model year GHG standards are appropriate?

The analysis in the 2016 TAR and updated in U.S. EPA's Proposed Determination confirmed that the 2022 through 2025 model year GHG standards can be met predominantly with lower

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[22] Nissan 2016. Fujimoto, Yutaka, Nissan Technical Center N.A., "Introduction of Variable Compression Turbo Engine" (Presented at Technology Symposium, Advanced Clean Cars: The Road Ahead, September 28, 2016). https://www.arb.ca.gov/msprog/consumer_info/advanced_clean_cars/vct_engine_technology_yutaka_fujimoto.pdf

[23] Tula 2016. Younkins, Matthew, Tula Technology, "Tula Technology's Dynamic Skip Fire" (Presented at Technology Symposium, Advanced Clean Cars: The Road Ahead, September 28, 2016). https://www.arb.ca.gov/msprog/consumer_info/advanced_clean_cars/potential_benefits_of_cylinder_deactivation_matthew_younkins.pdf

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cost technology improvements than were originally projected in the 2012 rulemaking. The updated costs and technology mix projections confirm there are more cost-effective technology options than originally thought and result in a slightly lower overall estimated cost to comply. Furthermore, not all GHG reducing technologies that manufacturers are already planning for production were included in the 2016 TAR leaving additional technology paths for manufacturers to use for compliance.

The analysis concludes that minimal usage of ZEV technology will be needed in the national fleet to meet the GHG standards in model year 2025, with less than 5 percent of LDVs taking the form of a BEV or PHEV, as shown in Table 3 above. Given the ZEV market share in California was already at 3 percent in 2015, manufacturers seem adequately positioned to achieve this level of nationwide electrification in another 10 years especially with manufacturer product plans to more than triple the number of ZEV models available in the next five years and with battery costs declining faster and earlier than previously anticipated.

It is also encouraging to note that historically, manufacturers have frequently outpaced projections by the agencies in terms of increasing the capability of a technology to meet the requirements, using additional technologies unforeseen in the original projections, and doing so at lower costs than expected. The automotive market is extremely competitive and manufacturers and suppliers have significant expertise in developing and deploying innovative solutions to meet regulatory standards. The 2016 TAR recognizes this is already happening with technologies like Atkinson cycle engines, 48 Volt mild hybrids, and continuously variable transmissions now projected to have a larger role than what was imagined just four years ago.

Accordingly, this analysis confirms 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.

What is the status of the treatment in the federal program of upstream emissions due to electricity and hydrogen generation for use in vehicles?

Board direction to staff included continuing to collaborate with U.S. EPA and NHTSA in the development and midterm evaluation of the national standards to minimize the chance for a reduction in GHG benefits from the different regulatory treatment of upstream emissions in the California and Federal programs. At the time of that direction, the California GHG standards included provisions to assign GHG emissions to alternative fuel vehicles like BEVs, PHEVs, and FCEVs to account for any incremental increase in GHG emissions needed to produce the electricity or hydrogen relative to producing gasoline. The federal GHG standards similarly accounted for upstream emissions but a provision was being considered at the time to temporarily waive that requirement and the Board expressed concern that such an action would result in a slight decrease in the cumulative GHG benefits. The final federal standards did ultimately include a temporary exemption from that provision for all BEVs, PHEVs, and FCEVs through the 2021 model year and a more limited exemption through the 2025 model year for a maximum number of vehicles per manufacturer.

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Based on the latest projections, a few manufacturers would be expected to exceed the maximum vehicle limits and be required to start accounting for upstream emissions before the 2025 model year. Thus, ARB will continue to work with the federal agencies to track and address this policy issue.

Meanwhile, a number of programs both specific to California and nationwide have evolved that are relevant to the assessment of upstream emissions for electricity generation and hydrogen fuel production. These include California's Low Carbon Fuel Standard (LCFS), which requires a carbon intensity reduction in gasoline and diesel (which can be partly met with alternative fuel credits), and Renewables Portfolio Standard (RPS) which requires a renewable supply for electricity. Both of these rules directionally require reductions in GHG emissions associated with the production of vehicle fuels including electricity and hydrogen. Federally, the Clean Power Plan (CPP) adopted in 2015 could result in substantial reductions in GHG emissions from electricity generation nationwide yet there is significant uncertainty regarding the future of CPP given the current legal challenges. California, however, continues to vigorously defend the CPP and will continue to press U.S. EPA to fulfill its duties to control stationary source GHG emissions. Given these clean fuel programs have progressed beyond what ARB assumed in the 2012 rulemaking, it appears that upstream emissions for PHEVs, BEVs and FCEVs are being addressed.

Have consumer purchasing trends and California's fleet mix shifted in vehicle footprint to larger and higher polluting vehicles or resulted in the reclassification of cars as trucks that would deviate from the projected fleet in staff's original 2012 analysis?

The final question that the Board wished to examine concerning the LEV III GHG regulations was the question of a shift in California's fleet mix to larger vehicles and the reclassification of cars as trucks that deviates from what was projected in the original rule and the impact on the expected benefits of these regulations. As discussed in the 2016 TAR, the current and projected future mix of new vehicle sales has shifted to more trucks and fewer cars than was originally projected in 2012 for the nationwide fleet. However, in terms of the California fleet, as discussed in Appendix M, the trends are similar but the overall result is different because of a larger fraction of car sales in California's market.

With respect to footprint, the California and national fleets are showing a very slight increase in the sales weighted footprint of the combined fleet. However, it is not yet clear if the construct of the GHG standards are the determining factor influencing this trend. In its Trends Report, U.S. EPA looked at the average footprint for new cars and trucks sold nationwide for the 2008 through 2015 model years.[24] That analysis, summarized in Table 6 below, shows the average footprint of a new car has increased by 0.8 square feet (approximately 1.8 percent) and the average footprint of a new truck has increased by 1.5 square feet (approximately 2.8 percent) within this time period.

[24] EPA 2015b

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Table 6 - Average New Car and Truck Footprint for model years 2008 through 2015

Model Year	Car Footprint (square feet)	Truck Footprint (square feet)
2008	45.3	54.0
2009	45.1	54.0
2010	45.4	53.8
2011	46.0	54.4
2012	45.7	54.5
2013	45.9	54.7
2014	46.1	55.0
2015 (preliminary)	46.1	55.5

Source: U.S. EPA's *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2015 Trends Report*

When combined with the increasing share of the market from truck sales, the slight increase in average footprint does result in an overall increased nationwide car/truck fleet average relative to what was originally projected. The largest influence appears to be a higher share of truck sales that generally have a larger footprint than cars rather than a significant increase in the average footprint within the car or truck segment itself. However, given the substantial lead time necessary to redesign base vehicle platforms including parameters that determine the footprint, it is probably too early to determine the impact of standards adopted only four years ago. Accordingly, the agencies will continue to monitor trends in the national and California-specific fleet and should there be an indication that the footprint based structure of the regulation is resulting in a loss of GHG reductions, ARB can consider options to fill the shortfall in future rulemakings.

On the question of reclassification of cars as trucks, there has been an increase in the share of trucks in new vehicle sales and the 2015 AEO projections noted earlier also predict a larger share of trucks in 2025 than originally projected. However, a shift to more trucks is not necessarily an indication of manufacturers making changes to reclassify vehicles that were formerly considered cars. U.S. EPA looked at national trends associated with the classification of small sport utility vehicles or SUVs (inertia weights of 4,000 pounds or less) as either cars or trucks between model years 2000 and 2015. SUVs of this size are classified as cars if they have 2-wheel drive and as trucks if they have 4-wheel drive and meet other design criteria. Based on the trends shown in Figure 2, it does not appear that a reclassification of small SUVs from cars to trucks is occurring at this time.

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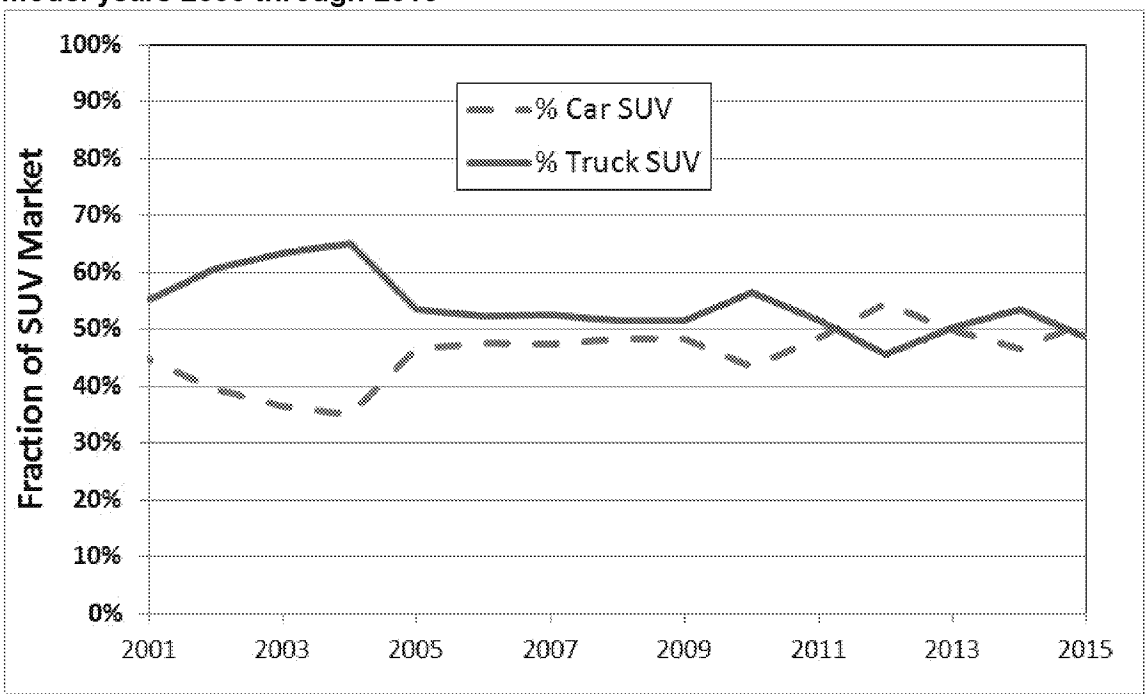
Figure 2 - Car-Truck classification of SUVs with inertia weights of 4,000 lbs or less for model years 2000 through 2015



Source: U.S. EPA's *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2015 Trends Report (EPA 2015b)*

Observations to date largely confirm a change in consumer preference from sedans to crossover and small utility vehicles that are not related to a reclassification of an existing model from a car to a truck. For example, Toyota has indicated the RAV4 SUV is poised to displace the Camry sedan as the company's top selling model in the U.S.[25] resulting in increased truck sales not because Toyota is reclassifying a vehicle from a car to a truck but because consumers are choosing to buy a different vehicle. However, as noted with respect to vehicle footprint, it has only been four years since the GHG standards were adopted and vehicle redesigns that would be necessary to change a vehicle's classification from car to truck can require significant lead time.

In the California fleet, preliminary data for the 2012 through 2014 model years are generally consistent with the trends observed nationwide although California has a significantly higher share of car sales than the nationwide fleet and the California vehicle footprints are slightly different for both the car and truck fleets. Similar to nationwide, the California car/truck mix is shifting towards higher truck sales but, unlike the national fleet where cars and trucks are expected to be about equal shares by 2025 in the 2015 AEO projections, cars are still expected to remain the larger share of the California fleet in 2025. Staff expects that further changes to car/truck sales mix and average footprint in the California fleet will likely be similar to trends happening nationwide as projected by the more recent 2016 AEO and has developed its

[25] Toyota 2015. Toyota Motor Corporation. Bob Carter. Quoted in Bloomberg article December 3, 2015, http://www.bloomberg.com/news/articles/2015-12-03/toyota-says-rav4-small-suv-will-dethrone-camry-as-its-top-seller

analysis by applying the same growth trends in the nationwide 2016 AEO to the California-specific fleet.[26] The reader can refer to Appendix M for further details.

When considered in total, the newer and more accurate information regarding footprint and car/truck share in the California fleet does result in a different projection of GHG benefits than originally projected for ARB's 2012 rulemaking. The original California projection included a conservative assumption that cars represented only 63 percent of the California market and that this fraction would essentially remain unchanged through model year 2025. For footprint, the original assumption was a constant 45.1 and 52.3 square feet for cars and trucks, respectively through 2025 model year. These assumptions resulted in a projected combined new car/truck fleet average of 166 grams per mile (g/mi) CO_2 in the 2025 model year in California. From actual sales data, it is now known that cars represented approximately 73 percent of the California fleet in 2012 and, despite a shift to more trucks since then, the car sales share is still above 69 percent today. It is also known that the actual footprint was about 1 percent higher and the truck footprint was about 5 percent higher than originally estimated.

The higher fraction of car sales results in lower (more stringent) emission targets for those years relative to the original assumptions, but the larger footprints mostly offset those reductions such that the overall emission targets remained essentially the same as the original 2012 projections for the 2012 through 2015 timeframe. Beyond the 2015 timeframe, however, the new projections based on the 2016 AEO generally show increased reductions (more stringent target standards) than originally projected primarily because the car share remains higher than originally thought. Accordingly, the combined new car/truck fleet average in California for 2025 is now projected to be between 153 and 167 g/mi CO_2 when using the AEO scenarios and footprint growth sensitivities analyzed by staff including the AEO reference, high fuel price, and low fuel price scenarios as illustrated in Figure 3 below. Only in the sensitivity case using the AEO reference, coupled with a continued footprint growth, does the combined new car/truck fleet average exceed what was estimated in the 2012 ARB rulemaking (167 vs. the original 166 g/mi CO_2).

[26] 2016 TAR utilized data from the 2015 AEO report as the 2016 AEO report wasn't published until Sept 2016

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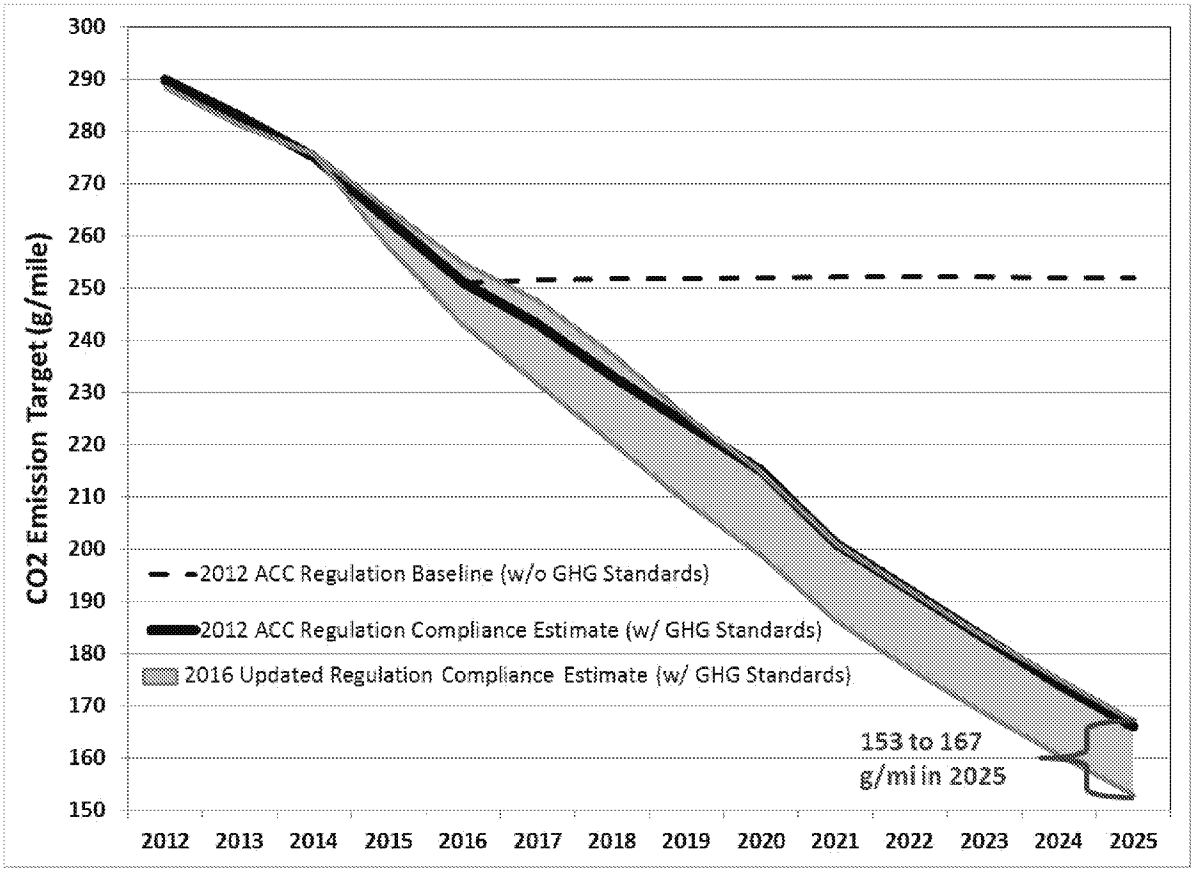
Figure 3 - Updated estimates of combined new car/truck fleet average in CA (gCO_2/mi)



Particulate Matter Emission Standard Review

What are the LEV III particulate matter emission standards?

PM emissions from light- and medium-duty vehicles are regulated as part of the LEV program. Under LEV III, the PM emission standard for passenger cars, light-duty trucks, and medium-duty passenger vehicles was lowered from 10 mg/mi to 3 mg/mi starting with 2017 model year vehicles. The 3 mg/mi PM standard is phased-in incrementally with full implementation by model year 2021. LEV III lowers the PM standard even further to 1 mg/mi starting with 2025 model year vehicles and also phases-in incrementally, with full implementation attained by model year 2028. In the long term, the 1 mg/mi PM standard will be an effective backstop to retain the progress in PM emission reductions achieved by today's gasoline car fleet in California and further reduce the health impacts associated with exposure to PM emissions. It will also help ensure the continued development of low-PM engine technology.

Mitigation of the impact of PM emissions on public health is of paramount concern to ARB. Consequently the Board directed staff to explore the feasibility of implementing this standard earlier than the scheduled 2025 model year implementation. This required a re-evaluation of

both the emission measurement feasibility and the technological feasibility of the 1 mg/mi PM standard based on the best available information available today.

What emission reductions are expected from implementation of the 1 mg/mi PM standard?

The relationship between PM exposure and health effects is well documented in that increased exposure leads to cardiopulmonary disease and several other adverse health outcomes. In general, lower PM standards will help reduce ambient PM2.5 emissions levels statewide, in the San Joaquin Valley (SJV), and near busy roadways. The implementation of the adopted 1 mg/mi standard is projected to reduce PM in 2035 by 0.33 tons per day (TPD) statewide and by 0.03 TPD in the San Joaquin Valley.

The black carbon fraction of PM emissions is a recognized short lived climate pollutant with a strong global warming potential (GWP), between 900 and 3200 times more powerful than CO_2, making even small reductions in black carbon directionally beneficial to meeting California's GHG reduction goals. The climate change benefit in 2035 from the black carbon reduction associated with the 1 mg/mi standard is 70,000 and 270,000 metric tons CO_2-equivalent annually for 100-year and 20-year GWP, respectively, which is small but appreciable.

Is the gravimetric PM mass measurement method appropriate for the 1 mg/mi standard?

In October 2015, staff presented a technical review of the feasibility of low PM mass emission measurement to the Board.[27,28] This review was conducted by ARB researchers, in collaboration with U.S. EPA, industry, and other stakeholders and was based on extensive studies, testing, and laboratory evaluation of PM emissions at 1 mg/mi and below.

As a result of these studies, staff concluded that the existing gravimetric method prescribed for the Federal Test Procedure (FTP) driving cycle and specified in the 40 Code of Federal Regulations, Parts 1065 and 1066 in conjunction with appropriate laboratory practices is sufficient for precise measurement of PM emissions at and below 1 mg/mi. These studies also revealed that, at very low PM emission levels, the correlation of PM mass to various alternative measurement metrics such as solid particle number emissions or black carbon emissions varied for different test cycles and engine technologies resulting in a determination that these methods were not equivalent to the gravimetric method in determining PM mass but still yielded useful information in understanding vehicle PM emissions.

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[27] ARB 2015b. California Air Resources Board. Staff Presentation. October 22, 2015. http://www.arb.ca.gov/board/books/2015/102215/15-8-7pres.pdf
[28] ARB 2015a.

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Is technology available today that enables manufacturers to meet a 1 mg/mi PM standard?

While the core necessary technologies exist today, this new assessment suggests that additional refinement prior to vehicle portfolio-wide deployment is needed to ensure a robust solution to meet the standard. Advanced GDI technology, the fuel injection technology preferred by auto manufactures for its GHG benefit, coupled with appropriate in-cylinder improvements such as software or engine hardware modifications can be used to meet the 1 mg/mi PM standard. In-cylinder improvements are primarily aimed at reducing or eliminating fuel impingement on combustion chamber surfaces and other localized rich combustion areas that lead to incomplete combustion and high PM emissions. If cases exist where in-cylinder control is not sufficient or the manufacturer prioritizes other design considerations, aftertreatment devices such as gasoline particulate filters (GPFs) represent a viable alternative to meet the 1 mg/mi emission limit. These compliance options are explained further below.

Manufacturers can use a variety of software improvements to control PM emissions including optimized injection timing, precise fuel metering, and multiple injections per combustion event. These strategies, combined with engine hardware improvements, help to reduce fuel impingement on combustion chamber surfaces, the major contributor to PM emissions. This is particularly critical during cold start operation when the combustion chamber surfaces are cold and PM emissions are at their highest.

Improvements to engine hardware include improvements to the fuel injection system, combustion chamber design, and thermal management. Fuel injection system improvements include injector designs with shaped spray patterns to minimize or eliminate fuel impingement on combustion chamber surfaces, increased fuel system pressures to reduce fuel droplet size and improve atomization, and improved injector tip design to reduce coking, which can lead to increased PM formation as the system ages. Improvements to the combustion chamber and intake port designs include changes to the shape of the piston top to reduce fuel impingement, thermal management of the injector tip and piston top to facilitate rapid evaporation of liquid fuel, and intake port design to increase tumble and reduce wall wetting while improving the air/fuel mixture. Many of these changes require extensive engine hardware re-design.

Manufacturers can also employ aftertreatment changes to reduce PM emissions. Cold-start catalyst light-off strategies to rapidly heat up the catalyst and catalyst design can indirectly reduce PM emissions. Changes to the catalyst layout including the use of a more closely coupled catalyst to the exhaust manifold can reduce catalyst light-off time thereby limiting the duration of a catalyst light-off combustion strategy that temporarily increases engine-out PM emissions. PM emissions can also be directly controlled with a GPF. GPFs are placed in the exhaust to trap PM emitted by the engine regardless of vehicle operational mode. The GPF can be integrated into the existing emission control configuration as a catalyzed substrate that replaces a portion of the three-way catalyst system or as a separate non-catalyzed device that

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is added downstream from the existing catalyst(s). GPFs have been reported to have low backpressures such that the adverse effect on GHG emissions is insignificant or minimal.[29] While the costs of adding a GPF may be higher than in-cylinder PM control solutions that can be incorporated during a scheduled re-design, they provide manufacturers with a robust alternative strategy for reducing PM emissions.

Are vehicles capable of meeting the 2025 model year 1 mg/mi PM emission standard while complying with the stringent GHG and NMOG+NOx tailpipe standards?

Effective PM emission control balances GHG, hydrocarbon (HC), and NOx emissions against PM reductions. This is particularly critical during cold-start emissions when up to 90 percent of criteria pollutant emissions occur. Some manufacturers have indicated that optimal fuel injection strategies for PM control during cold-start operation can significantly affect HC and NOx emissions. Accordingly, manufacturers must be careful when implementing new control strategies to maintain control of HC, NOx, and GHG emissions.

The test data and analysis presented in this report shows that vehicle manufacturers have achieved significant PM emission reductions over the last redesign cycle and are on track to meet the 1 mg/mi PM emission standard in the required timeframe even as they implement advanced technologies to reduce GHG, HC, and NOx emissions. A key aspect of this assessment is the ability of manufacturers to incorporate necessary in-cylinder 'best-practices' for PM control into scheduled engine updates or redesigns. As noted in Appendix K, recent testing of vehicles using engine technologies representative of likely future low GHG-emitting vehicles has shown considerable reductions in PM emissions in anticipation of the upcoming 3 mg/mi standard with most vehicles already emitting below 1.5 mg/mi. This is substantially lower than earlier generation GDI equipped engines and a direct result of the recent redesigns that most of the tested engines have had in anticipation of upcoming PM emission standards. As noted earlier, the ACC program was designed to ensure that manufacturers fully considered criteria pollutant requirements (including PM emissions) in concert with the increasingly stringent GHG standards as they developed GHG technologies for future vehicles but also factored in engineering and laboratory resource constraints that manufacturers face. These considerations resulted in the longer lead time provided for the phase-in of the 1 mg/mi PM emission standard.

What are the results from ARB's PM test program?

ARB staff procured and tested commercially available vehicles that use low-GHG internal combustion engine technologies that are projected to be commonly used on light-duty vehicles between model years 2022 and 2025. These vehicles are described in Appendix K. Given the

[29] Brezny 2016. Dr. Rasto Brezny. MECA. "Particulate Control Experience with GDI and GPFs." (Presented at Technology Symposium, Advanced Clean Cars: The Road Ahead, September 28, 2016). https://www.arb.ca.gov/msprog/consumer_info/advanced_clean_cars/gasoline_direct_injection_particulate_control_experience_with_gasoline%20_particulate_filters_for_gasoline_vehicles_rasto_brezny.pdf

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scheduled PM standard phase-in, none of the test vehicles were designed to meet the 1 mg/mi standard and none of the GDI equipped vehicles were yet certified to the 3 mg/mi standard (although the results indicate several were likely designed knowing that certification with the 3 mg/mi standard would be required in the next few years). The test program found that, although some vehicles emitted below the 1 mg/mi standard, the majority did not meet the standard with an adequate margin of compliance to account for variability and emission increases that can occur over the full useful life of a vehicle. The low-GHG internal combustion engine technologies that were tested mostly rely on in-cylinder controls that are likely solutions for compliance with the 3 mg/mi PM standard. Among the vehicles ARB tested to evaluate PM emissions include several that meet the stringent LEV II SULEV standards. These results show the potential of vehicles to simultaneously meet the future GHG and low criteria pollutant emission standards including PM standards.

According to staff's analysis presented in Appendix J, there is still opportunity for further improvement of PM control relative to current GDI vehicles. Many of the vehicles ARB tested, presented in Appendix K, emit at levels that would readily comply with the 3 mg/mi PM emission standard with emissions from 1.2 – 1.4 mg/mi on the FTP cycle. This is consistent with manufacturers' assertions that because of variability, uncertainty, and durability requirements for the full vehicle useful life of 150,000 miles, the target emission rate is about half the standard for vehicles certified to the 3 mg/mi PM standard. The data also indicate that controlling PM emissions to meet the 3 mg/mi standard does not necessarily lead to emission rates below 1 mg/mi and, for most vehicles, further work will be necessary to ensure compliance with a 1 mg/mi standard. Given the progress already seen with lower PM levels in anticipation of the 3 mg/mi standard, manufacturers should have sufficient time to incorporate further improvements in fuel system and engine design, controls, and calibration to reduce PM levels below the 1 mg/mi standard.

However, the test results shown in Table 7 below also revealed that some vehicles that exhibit good control of PM emissions on the FTP cycle have notably higher emissions on the US06 cycle, which is representative of high speed and acceleration driving conditions. As indicated by these test results, low FTP PM emissions do not necessarily correspond with low US06 emissions. This is of concern because the FTP and US06 standards are used by ARB to ensure robust in-use emission control over the spectrum of typical real-world driving conditions. Under the LEV III regulations, the FTP PM emission standard drops to 1 mg/mi in 2025, but the US06 standard remains at 6 mg/mi indefinitely. The test program results confirm that the current US06 standard may not ensure a sufficient level of emission control. Further, high emissions during the US06 cycle may relate to higher near-roadway emission levels and subsequent exposures, which can have a disproportionate impact on low income and sensitive populations who may reside, work, or spend significant time near busy roadways.

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Table 7 - PM FTP and US06 Test Results

Vehicle	Emission Category	FTP	US06
		Average Mass (mg/mi)	Average Mass (mg/mi)
2012 Lexus IS350	LEV II ULEV	5.6	1.3
2013 Chevy Volt	LEV II SULEV	0.3	0.1
2013 Toyota Prius PHEV	LEV II SULEV	0.1	0.3
2014 Ford Fiesta	LEV II ULEV	1.4	1.4
2014 Mercedes CLA	LEV II ULEV	0.3	0.3
2014 Mini Cooper S	LEV II ULEV	0.4	1.2
2015 Mazda 3	LEV II SULEV	1.5	0.6
2015 Subaru BRZ	LEV II ULEV	1.0	3.1
2016 Honda Accord	LEV III SULEV	0.9	1.7
2016 Hyundai Sonata PHEV	LEV III SULEV30	1.2	2.3
2016 Toyota Prius	LEV III SULEV30	0.1	0.3
2016 Toyota Tacoma	LEV III ULEV70	0.4	2.3
2016 VW Jetta TSI	LEV II ULEV	0.3	1.0

Staff also tested prototype gasoline particulate filters (GPFs) for controlling PM emissions on two newer GDI engines that had gone through a partial redesign cycle, but would not yet readily meet the 3 mg/mile standard. The emission reductions from GPF testing are shown in Table 8. On the FTP, an 88% reduction was observed for both vehicles and brought emissions to a level below 1 mg/mi. The effectiveness of the GPFs on the US06 was somewhat lower, reducing PM emissions by 72% and 54% respectively for the F-150 and Malibu. The results from both vehicles show that GPFs are an effective control technology to meet future 1 mg/mi PM standards, even for particularly challenging engines.

Table 8 – PM GPF Test Results

	FTP		US06	
Vehicle	Average Mass (mg/mi)	GPF Effectiveness (%)	Average Mass (mg/mi)	GPF Effectiveness (%)
2015 FORD F150	5.5		3.9	
2015 FORD F150 W/GPF	**0.6**	**88%**	**1.1**	**72%**
2016 CHEV MALIBU	7.0		2.1	
2016 CHEV MALIBU W/GPF	**0.8**	**88%**	**0.9**	**54%**

Should the 1 mg/mi PM emission standard be phased-in earlier based on the new analysis?

As discussed earlier, given manufacturers' progress to date it is reasonable to expect that with a similar effort over the next design cycle(s), all future vehicles will be able to meet the 1 mg/mi FTP standards as projected in the 2012 LEV III ISOR.[30] However, accelerating implementation of the 1 mg/mi PM standard would jeopardize the ability of the manufacturers to incorporate the next round of necessary PM refinements across their entire vehicle offerings and within scheduled engine design updates. Less time to engineer and innovate robust solutions would reduce the ability of manufacturers to validate their current round of PM improvements and determine if these improvements are sufficiently durable to ensure low emissions throughout the 150,000 mile useful life of LEV III vehicle standards.

While there are other technologies that are near production ready such as even more advanced injection control systems or GPFs that could be used prior to model year 2025 to meet the 1 mg/mi standard, such technologies would likely result in an increased cost to comply than originally projected and divert testing and development resources from manufacturers that are focused on achieving other required reductions in the same timeframe. Further, these new technologies are still evolving and additional time is needed to ensure they are ready for wide-scale deployment, have sufficient durability, and the implications of their use relative to other emission requirements such as on-board diagnostic systems is understood.

Because of the necessary time to incorporate robust solutions to further reduce PM, implementing the 1 mg/mi PM standards substantially sooner than model year 2025 would likely entail increased costs to manufacturers (through unscheduled redesigns or increased reliance on GPFs) and have limited additional emission benefit. For ambient air quality, the projected incremental PM benefit associated with earlier implementation of the 1 mg/mi standard would be 0.06 TPD statewide and 0.007 TPD in the SJV in 2035. Accordingly, staff is not recommending pursuit of a regulatory action at this time to require earlier implementation of the 1 mg/mi PM emission standard.

What is staff's recommendation with respect to PM standards?

Staff's updated analysis has confirmed that compliance with the 1 mg/mi FTP standard by 2025 is feasible and manufacturers are on track to meet the standard. And, as noted above, staff is not recommending earlier implementation of the 1 mg/mi standard. However, the same research and testing in support of this midterm review has revealed concerns regarding the robustness of PM control under broader in-use driving conditions than the FTP represents.

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[30] ARB 2012b. California Air Resources Board. *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*. December 7, 2011. https://www.arb.ca.gov/regact/2012/leviiighg2012/levisor.pdf

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Accordingly, staff recommends pursuing a new regulatory update to ensure that, when the 1 mg/mi standard is phased-in, it results in robust PM control over the broad spectrum of driving conditions encountered in-use. Thus, staff recommends that the Board direct staff to: (a) pursue an increase in stringency of the US06 PM standard to ensure a similar level of PM emission control in conjunction with the 1 mg/mi FTP standard; and (b) to investigate adoption of additional standards and procedures applicable to other test cycles and ambient conditions that will ensure more comprehensive control of PM emissions under all operating conditions. These actions will also ensure that any future PM standards achieve meaningful and sustained in-use reductions.

ZEV Review

Are ZEVs and PHEVs still necessary for meeting California's long term air quality and GHG goals?

The LDV sector accounts for nearly 30 percent of the state's GHG emissions, making further reductions necessary in order to meet significant 2020, 2030, and 2050 GHG emission reduction targets in the future. In 2009, staff's modeling found "... [pure] ZEVs will need to reach 100 percent of new vehicle sales between 2040 and 2050, with commercial markets for ZEVs launching in the 2015 to 2020 timeframe."[31] More recently, the ARB Mobile Sources Strategy report, released in May 2016, confirmed the essential role electrification will need to play in the LDV sector to meet California's long term emission reduction goals. The updated VISION scenarios in the Mobile Source Strategy show that PHEVs can remain a permanent fraction of the market, providing more flexibility for manufacturers. However, as shown in Figure 4 the combined sales of pure ZEVs and PHEVs for light-duty vehicles will still need to achieve 100 percent by 2050. A recent American Lung Association analysis confirms the importance of a long-term, full electric transformation to reduce health based and social costs.[32] The study estimates health based impacts in 2015 from passenger vehicles in California and the Section 177 ZEV states to be $24 billion, but that the cost could decline to $3 billion by 2050 under a scenario where sales of ZEVs and PHEVs reach 100 percent by 2050.

[31] ARB 2009, California Air Resources Board. November 25, 2009. "2009 White Paper: Summary of Staff's Preliminary Assessment of the Need for Revisions to the Zero-Emission Vehicle Regulation" November 25, 2009. https://www.arb.ca.gov/msprog/zevprog/2009zevreview/zevwhitepaper.pdf

[32] ALA 2016, American Lung Association. "Clean Air: Health and Climate Benefits of Zero Emission Vehicles" October 2016. http://www.lung.org/local-content/california/documents/2016zeroemissions.pdf

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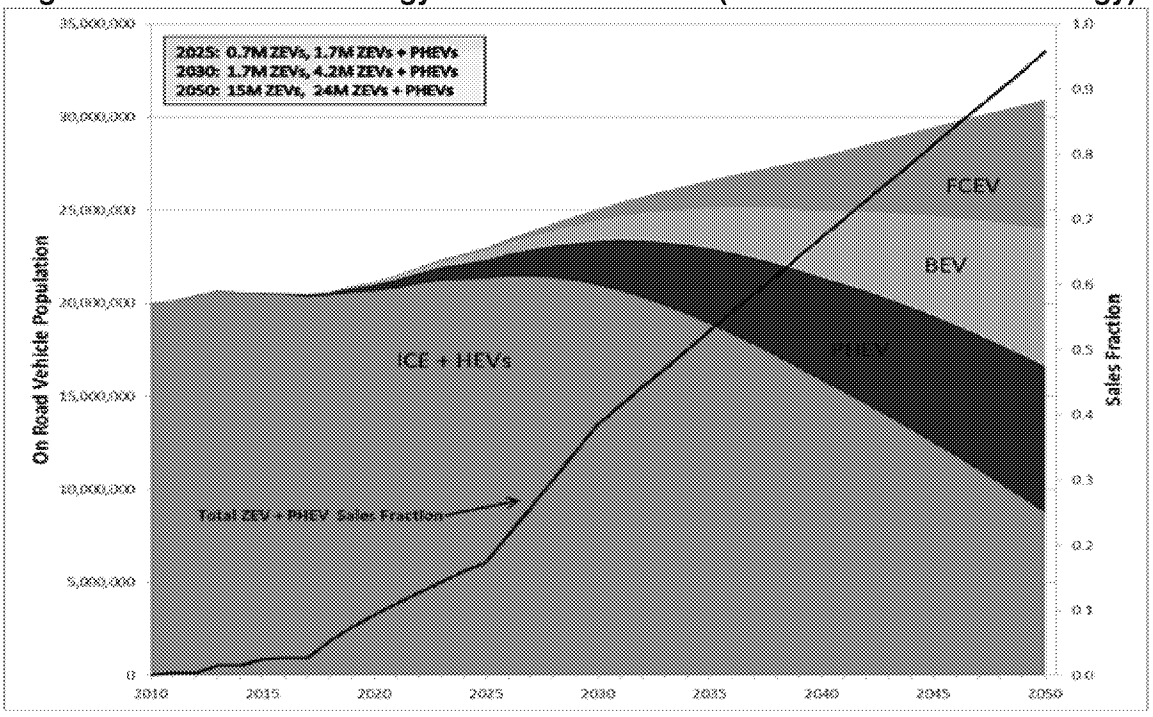
Figure 4 - Cleaner Technology and Fuels Scenario (2016 Mobile Source Strategy)



Do PHEVs provide equal or greater environmental benefit than BEVs?

Since 2014, manufacturers have used data from the U.S. Department of Energy (U.S. DOE) EV Project to support a position that PHEVs with substantial electric range could provide greater or equal environmental benefit than BEVs.[33] This assertion along with the Board's direction in 2012 led staff to assess how PHEVs are being used (in comparison to BEVs) and their overall emission impact.

A significant portion of PHEV miles can be attributed to grid powered energy (typically called a vehicle's electric vehicle miles travelled or eVMT). This correlates well with the PHEV's GHG emission benefit. However, eVMT does not provide a complete picture of how "ZEV-like" a PHEV is. One intrinsic benefit of a ZEV is its criteria pollutants emission reduction; zero engine starts mean ZEVs are an ideal solution to reducing criteria pollutant emissions. In this regard, staff analyzed two metrics to evaluate a PHEV's criteria pollutant benefit using data provided by manufacturers: electric only trips (e-trips) and zero-emission vehicle miles traveled (zVMT). e-Trips are trips when the vehicle's engine is not used at all (thus, an avoided engine start), whereas zVMT is the sum of miles from all e-Trips. Table 9, shown below is a summary of staff's analyses; further details can be found in Appendix G.

[33] Honda 2013. Robert Bienenfeld. "Honda's Testimony at the California Air Resources Board's Advanced Clean Car Hearing" October 24, 2013. Available: http://www.arb.ca.gov/lists/com-attach/21-zev2013-UCJVPFc0VWNVIQN3.pdf

Table 9 - Summary of eVMT and zVMT

Type of Vehicle	VMT – Annual Miles	eVMT – Annual Miles (% of VMT)	zVMT - Annual Miles (% of VMT)
Toyota Prius (PHEV)	15,283	2,304 (15%)	589 (4%)
Honda Accord (PHEV)	15,221	3,246 (21%)	1,471 (10%)
Ford C-Max Energi (PHEV)	13,920	4,574 (33%)	2,525 (18%)
Ford Fusion Energi (PHEV)	15,076	4,776 (32%)	2,368 (16%)
Chevrolet Volt (PHEV)	12,403	8,924 (72%)	7,313 (59%)
BMW i3 (BEVx)	9,063	8,387 (93%)	N/A
BMW i3 (BEV)	7,916	7,916 (100%)	7,916 (100%)
Ford Focus Electric (BEV)	9,741	9,741 (100%)	9,741 (100%)
Honda Fit (BEV)	9,789	9,789 (100%)	9,789 (100%)
Nissan Leaf (BEV)	10,294	10,294 (100%)	10,294 (100%)
Tesla Model S (BEV)	13,494	13,494 (100%)	13,494 (100%)

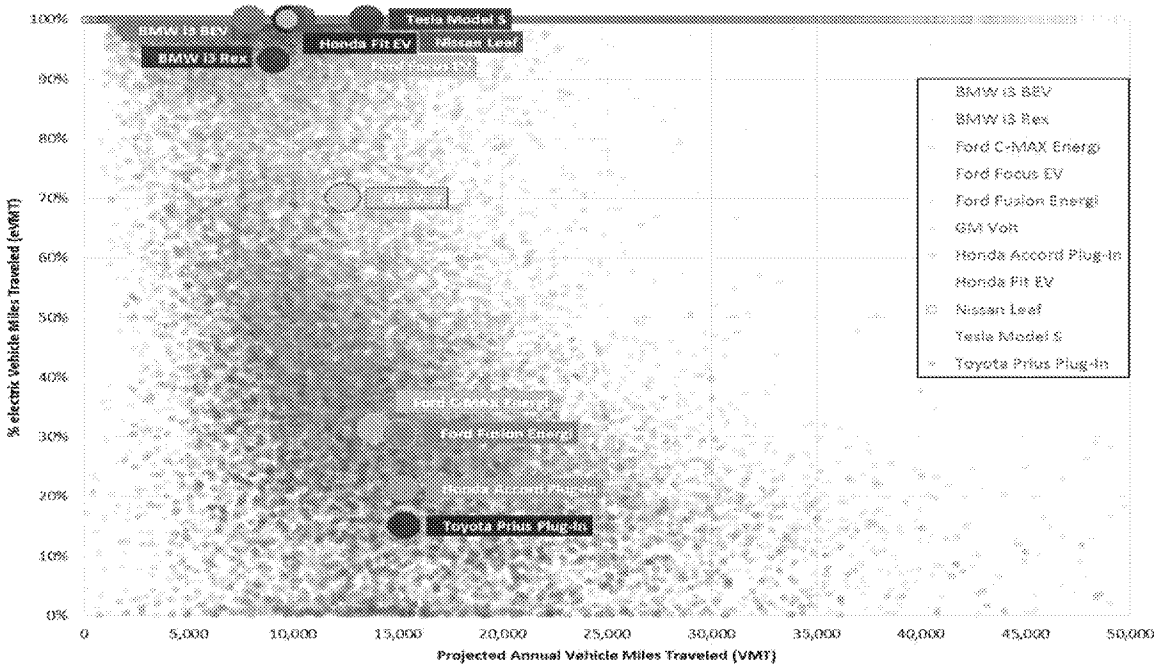
Each average presented in Table 9 represents a set of drivers in a given time.[34] However, driving data from the same vehicle model can vary widely dependent on when and under what driving conditions the data were collected. As an example, this can be seen when looking at data from the Chevrolet Volt. According to data from U.S. DOE's EV Project, total Volt VMT is ~12,400 miles on average. Approximately 72% of these miles are driven electrically, and are referred to as the vehicle's eVMT fraction. However, according to a 2016 General Motors press release based on a larger data sample of Volt drivers, Volts drive only 60% of their miles on grid-powered energy.[35] This difference could be due to the fact that EV Project participants

[34] Each manufacturer provided data set is fully described in Appendix G, Section II.
[35] GM 2016a. General Motors. Press Release. August 1, 2016. http://www.gm.com/mol/m-2016-aug-080116-volt.html

were a limited set of very early adopters and were given no-cost Level 2 charging equipment for home installation.[36]

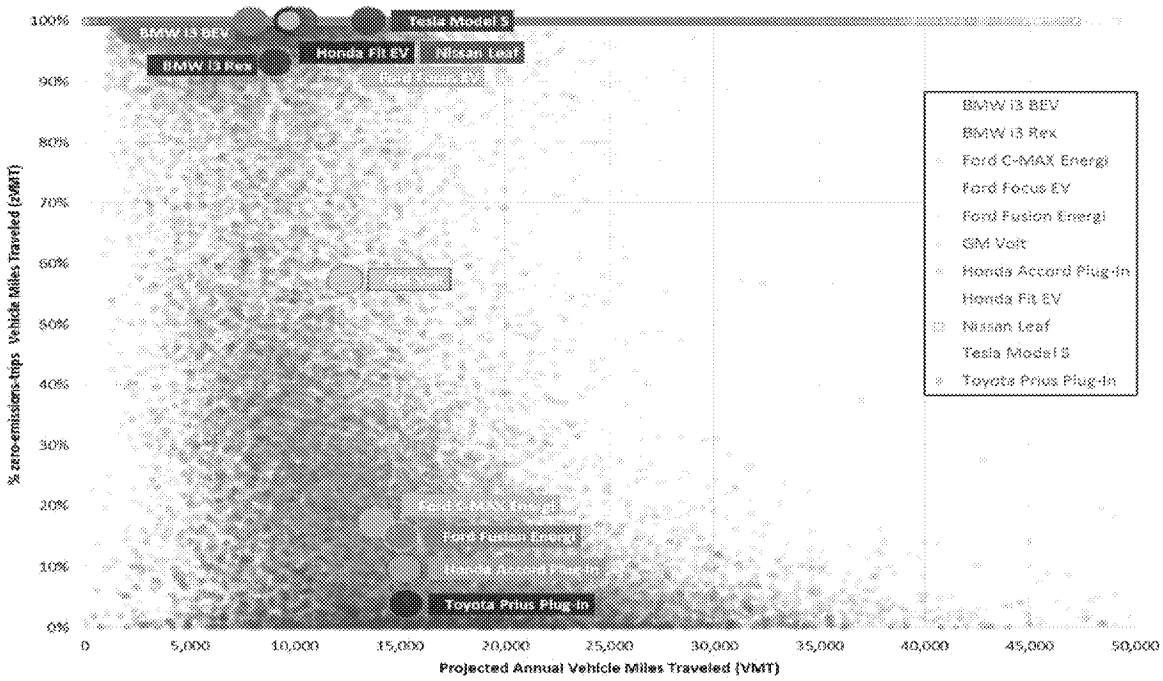
Table 9 shows average eVMT and zVMT for each PEV analyzed in staff's analysis. Averages, however, do not fully capture the model's potential environmental benefit or impact. These factors (both eVMT and zVMT) are highly driver dependent and based on daily trip distance, daily trip count, and electric charging accessibility and region, just like all VMT for conventional or advanced technology cars. Shown below in Figure 5 and Figure 6, vehicles with similar electric ranges have varied eVMT and zVMT. Even among the BEVs with a 100 to 120 mile urban dynamometer drive schedule (UDDS) electric range, there is significant variance in total VMT, while Tesla's Model S with well over 200 miles of range shows an even wider array of VMT across its single platform.

Figure 5 - eVMT variation across PEVs



[36] For a complete description of U.S. DOE of Energy EV Project and staff's full analysis, see Appendix G.

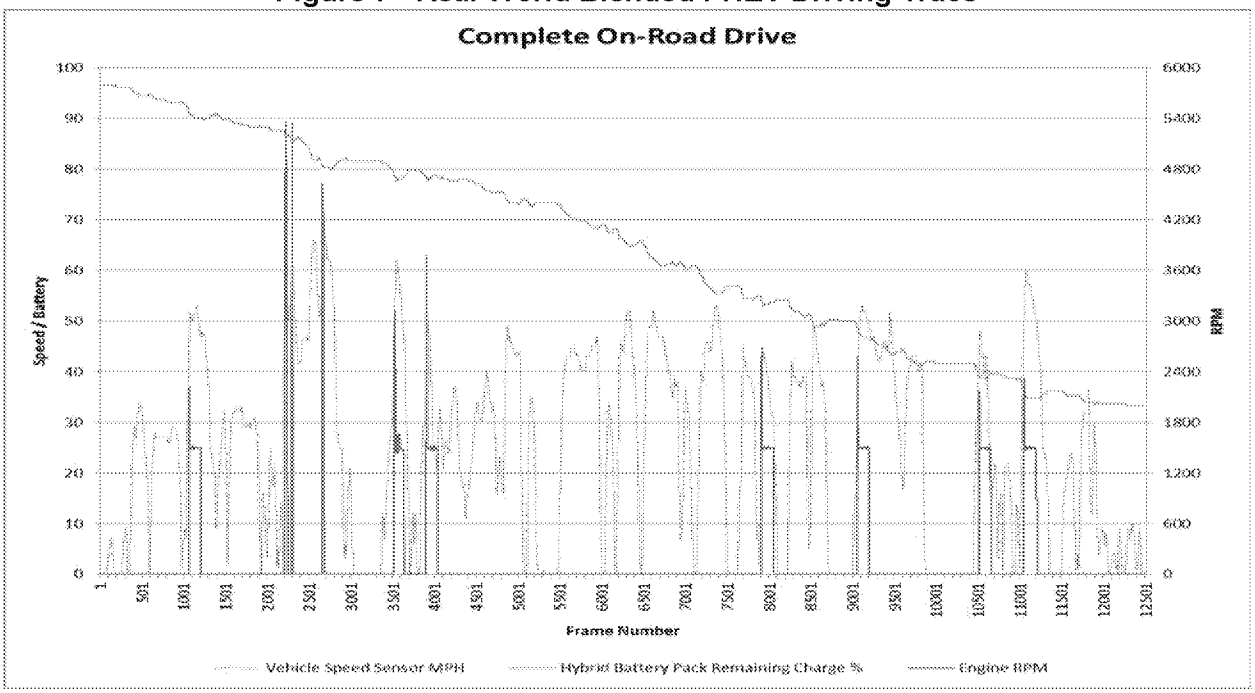
Figure 6 - zVMT variation across PEVs



Looking further into PHEVs criteria pollutant emission impacts, staff evaluated the cold start emissions of three blended PHEVs believed to be representative of currently available PHEVs and the results are presented in Appendix H.

For blended PHEVs, both grid energy and the internal combustion engine (ICE) can be used simultaneously to power the vehicle during charge-depleting (CD) operation. Generally this occurs when the vehicle power demand is higher than what the electric only propulsion system can provide and the vehicle starts the engine to combine the electric and ICE power to meet the vehicle demand. As a result, blended PHEV CD operation introduces a unique driving condition where the initial engine start of a trip occurs at a time where there is an immediate need for the engine to provide significant power and torque to help propel the vehicle. Such starts, referred to here as "high-power" cold-starts, can have different emission characteristics relative to the initial engine start of a conventional vehicle which typically occurs with the vehicle stopped, in park/neutral, and with a very low immediate torque demand. Figure 7 below shows a drive near ARB's Haagen-Smit Laboratory where a blended PHEV was operated through various roadway conditions to understand the types of conditions that cause these high-power engine starts before the battery has been fully depleted.

Figure 7 - Real-World Blended PHEV Driving Trace



The testing confirms that cold-start emissions can be significantly higher under high-power demand conditions relative to more traditional engine start conditions.[37] Staff will conduct further testing and has begun discussions with the vehicle manufacturers to discuss emission control strategies and alternatives that may provide for more robust emission control in these conditions. It is also important to note that all of the vehicles tested are first generation PHEVs and most manufacturers are expected to introduce more capable second generation PHEVs in the near future. To the extent future blended PHEVs have stronger electric propulsion systems and longer electric range, those vehicles should be able to reduce the frequency of trips with an engine start including those with a high-power engine start. As one example, the Prius Prime is Toyota's second generation PHEV and is designed to primarily operate as a non-blended PHEV, thereby potentially eliminating most high-power engine starts. However, as more manufacturers enter the PHEV market and PHEVs are introduced on larger and heavier vehicle platforms, blended PHEVs will likely continue to play a significant role and warrant continued evaluation to ensure in-use start emissions are controlled as robustly as possible.

Based on in-use data from PHEVs, emission testing, and analysis of electric use conducted by ARB, PHEVs can generate significant benefits over conventional vehicles but do not generally result in GHG or criteria pollutant emission reductions equal to pure ZEVs.

Could California meet its long term goals predominantly with PHEVs?

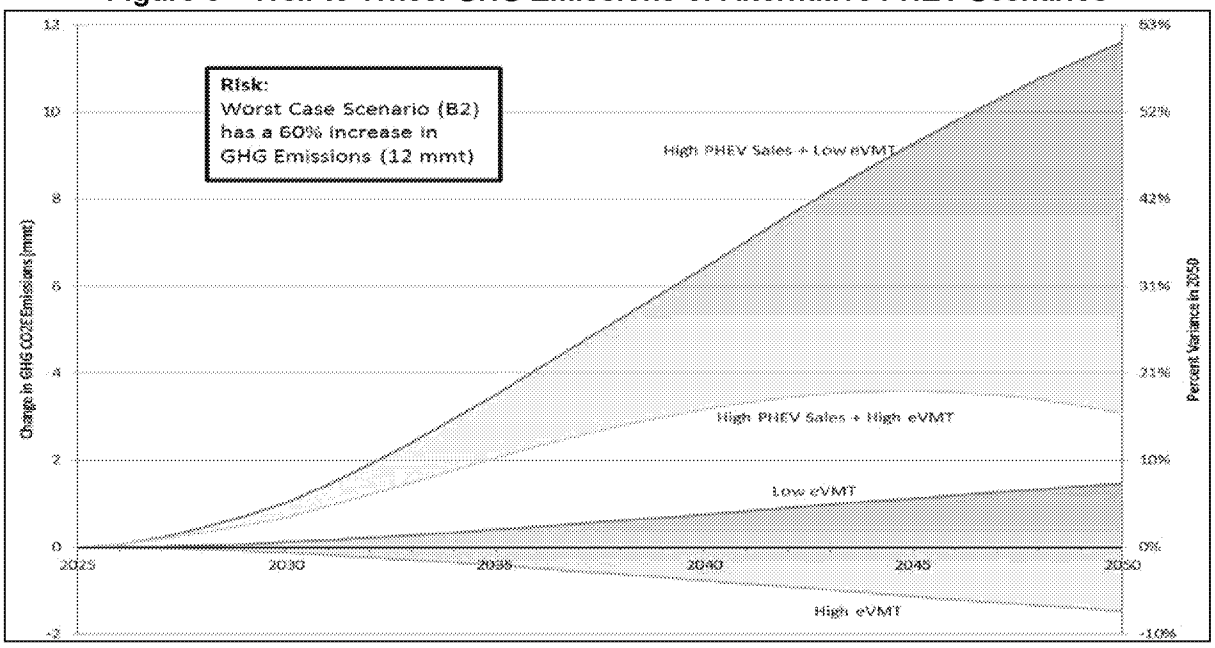
ARB's latest long-term scenario released in the Mobile Source Strategy (called the Cleaner Technologies and Fuels, or CTF, scenario) showed PHEVs could be a significant share of the

[37] Appendix H describes staff's in-house PHEV testing.

fleet (see Figure 4 above), and the light-duty vehicle sector would still be on track to meeting its share of emission reductions for the 2030 and 2050 GHG goals. This is due in part to aggressive assumptions in the vehicle sector including PHEVs achieving higher proportions of their miles on electricity, all gasoline vehicles having significant gains in fuel efficiency over time, increases in renewable energy usage, and slower growth in vehicle miles traveled (VMT) from all passenger vehicles. Allowing PHEVs to have a larger role in the future fleet helps to provide additional technology pathways toward meeting California's long term goals. However, as explained in staff's analysis of manufacturer-provided data and in-house testing, emission benefits from PHEVs are not only affected by vehicle range and architecture but are highly driver dependent, leading to significant uncertainty in future projections.

In order to assess the potential impacts of changes in PHEV parameters and higher PHEV sales fractions, staff developed several PHEV-focused VISION scenarios to assess how the presence of PHEVs in the LDV fleet may affect California's ability to meet its statewide GHG and criteria pollutant emission targets in the future. When using the CTF scenario PHEV sales trajectories, higher and lower eVMT growth rates show a modest sensitivity of less than ±7.5 percent change in projected GHG emissions by 2050. When combined with higher PHEV sales trajectory, however, the projected impact from the eVMT sensitivity ranged from a 16 percent to 60 percent increase in GHG emissions showing a much greater sensitivity to how the PHEVs are used in the fleet. Similar trends are found for criteria pollutants, further explored in Appendix F.

Figure 8 – Well-to-Wheel GHG Emissions of Alternative PHEV Scenarios

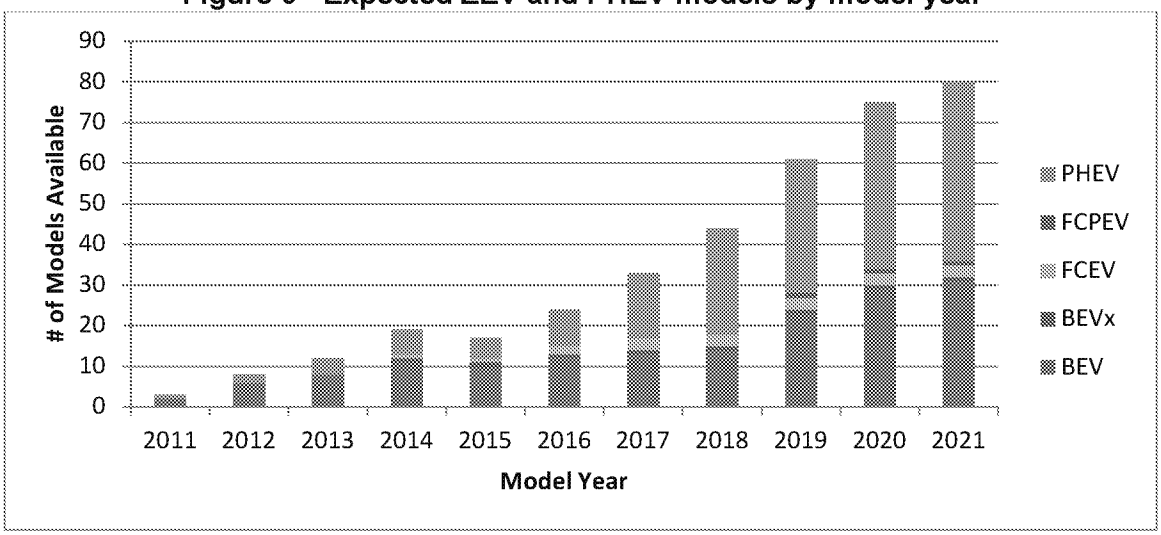


This suggests that, though PHEVs can be a significant share of the future fleet, there are limitations that make it necessary to still pursue substantial BEV and FCEV volumes and that there is additional risk associated with PHEVs dependent on user behavior due to their flexible nature.

How has ZEV technology progressed since 2012?

Technology has progressed faster than staff anticipated during the development of the 2012 rulemaking. Manufacturers are announcing longer range, more capable BEVs and PHEVs on widely diverse platforms, and within segments with high overall sales (i.e., cross-overs, mid-size cars). The most expensive components are also developing quickly and improving in most ways: they are safer, cheaper, and more energy dense resulting in higher energy content battery packs. This has led to the announcement of 80 ZEV and PHEV offerings over the next five model years, shown below.

Figure 9 - Expected ZEV and PHEV models by model year



BEVs and PHEVs

In 2012, BEVs were expected to be primarily small vehicles, with no more than 100 miles test range capability. Given the Tesla Model S, even at the $66,000 or higher price point, is the highest selling ZEV (or PHEV) in 2016 MY thus far and is a full size sedan with a real-world range of over 200 miles, manufacturers are quickly responding to the demands in the market. Most notably, lower priced longer range BEVs reached dealer lots within weeks of this report's release.[38] These range improvements at lower prices come from various improvements, but predominantly from reduced battery costs and improved battery technology. Battery technology development is achieving higher energy density resulting in longer range from the same physical size battery pack.

In addition to improvements in the battery, manufacturers are announcing BEVs that will be equipped with higher powered fast charging[39]. This will help lessen charge times for the expected longer range BEVs. Additionally, the emerging car and ride sharing market, and

[38] GM 2016b. General Motors. Chevy Bolt EV Website. http://www.chevrolet.com/bolt-ev-electric-vehicle.html Accessed October 25, 2016

[39] Porsche 2015. Porsche AG, "World premiere for Porsche Mission E," Porsche AG, 14 September 2015. [Online]. Available: https://newsroom.porsche.com/en/products/iaa-2015-porsche-mission-e-mobility-all-electrically-concept-car-11391.html

development in connected and autonomous vehicles (CAV), provide a nexus with PEVs in future years as a way to reduce emissions.[40]

FCEVs

Since the 2012 ACC rulemaking, Hyundai introduced the Tucson FCEV, the first mass-produced FCEV made available for retail lease in California. Toyota followed with the purpose built Mirai, which is offered for lease or sale to consumers. Additionally, Honda has released the Clarity for lease.[41] It is expected that two more manufacturers will release purpose built FCEVs over the next three model years.[42,43] While current costs remain high, projections based on U.S. DOE cost modeling for FCEVs indicate future reductions. At annual production volumes of 100,000 FCEVs (as are expected with further roll out of hydrogen infrastructure throughout California), the fuel cell system could be near $6,000 for a 100 kW stack and balance of plant similar to those that have been incorporated into the sedans and crossover utility vehicles currently on the market.[44] This marks the potential for roughly a 50 percent reduction in cost from today, based solely on economies of scale. Further cost reductions are expected due to technology development by the time annual production rates reach 100,000 FCEVs per year.

Electric Motors and Power Electronics

Applicable for all three of the technologies discussed above, manufacturers are looking ahead to improved electric motors and power electronics and reduced costs in attempts to meet the U.S. Drive targets. Manufacturers are bringing motor costs down by decreasing the total amount of rare earth metals used. General Motors, Honda, and BMW have all found ways to decrease rare earth metal usage in current products. In the case of General Motors, with the second generation Volt, rare earth metals were completely removed from one of their motor/generators in the powertrain system while still making the total powertrain more efficient and powerful for the customer.[45]

Manufacturers are also finding ways to better package power electronics to reduce part counts and complexity, and increase power density. On board chargers are increasing in total power capability and efficiency. Wide bandgap materials, like silicon carbide are currently being tested and developed by companies like Toyota with their hybrid Camry test fleet. Those materials will

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[40] Gardner 2016. Greg Gardner. USA Today. "Lyft will be first to get breakthrough Chevrolet Bolt EV." September 28, 2016. http://www.usatoday.com/story/money/cars/2016/09/28/lyft-first-get-breakthrough-chevrolet-bolt-ev/91238266/

[41] Honda 2016. American Honda Motor Corporation. Clarity Fuel Cell Website. http://automobiles.honda.com/clarity Accessed December 27, 2016

[42] Daimler, 2016. Daimler Global Media. "Under the microscope: Mercedes-Benz GLC F-Cell: The fuel cell gets a plug," http://media.daimler.com/marsMediaSite/en/instance/ko/Under-the-microscope-Mercedes-Benz-GLC-F-CELL-The-fuel-cell-.xhtml?oid=11111320 Accessed September 26, 2016.

[43] Reuters 2016. Reuters.com "Hyundai Motor to launch new fuel cell car in early 2016: exec" May 18, 2016. http://www.reuters.com/article/us-hyundai-motor-fuel-cell-idUSKCN0Y90VI Accessed January 11, 2017

[44] EPA 2016

[45] Brooke 2014. L. Brooke, SAE International. "GM unveils more efficient 2016 Volt powertrain," 29 October 2014. http://articles.sae.org/13666/ Accessed October 4, 2016

enable even smaller, more efficient, and more power dense electronics on vehicles with lower cooling loads that will enable lower costs and longer ranges.[46]

Incremental Costs

Battery costs have come down from what was assumed in the 2010 TAR and 2012 rulemaking. Comparing the 2010 TAR with the 2016 TAR assumptions, battery costs have been reduced between 20-35% depending on the application and size of battery pack, which can be seen comparing the 2011 BEV100 to the 2016 BEV75 in Table 10 below. However, staff is now expecting to see longer range BEVs on the road in future model years. This means that, compared to the 2012 ARB rulemaking which assumed a 100 mile electric range BEV (BEV100), incremental costs are slightly higher than would have been expected for high volume, fully learned out costs in MY2025 due to the expected increase in on board energy storage requirements (BEV200). Table 10 below compares the previous (2011) cost estimates to the updated 2016 TAR cost estimates.

Table 10 - Incremental Costs (2025 ZEV compared to 2016 ICE vehicle, 2013$)

2013 $	2011 ISOR (ACC Rulemaking)			2016 TAR (EPA, NHTSA, ARB) **			
	BEV100	PHEV40	FCEV	BEV75***	% Diff	BEV200	PHEV40
Subcompact	$ 11,804	$ 11,182	$ 8,189	$ 7,505	36.4%	$ 12,001	$ 9,260
MdC / SmMPV	$ 12,591	$ 12,037	$ 10,174	$ 8,183	35.0%	$ 13,422	$ 10,554
Large Car	$ 14,566	$ 15,685	$ 14,613	$ 11,355	22.0%	$ 16,746	$ 13,991

* *ISOR Table 5.4 adjusted to 2013$ with 1.09 CPI factor*[47]

** *EPA OMEGA EV based on "label" range, ARB is UDDS. "Diff" = EPA BEV75 to ARB BEV100 Label vs. Test adjustment: 0.70*

*** *15% weight reduction package*

How has the overall ZEV and PHEV market developed in California and the Section 177 ZEV states since 2012?

Beginning in 2010, there was only one regulated manufacturer with a single product on the market: the Chevrolet Volt.[48] Since that time, the market has grown to a total of 25 models offered by 14 manufacturers. With the exception of the GM "TBD" FCEV and the Mitsubishi Outlander PHEV[49], every model shown in the 2011 ZEV ISOR (released in preparation for the ACC rulemaking) has been released in the U.S. market. Seven additional models were released that were not anticipated prior to the 2012 ACC rulemaking.

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[46] GreenCar, 2015. Green Car Congress, "Toyota beginning on-road testing of new SiC power semiconductor technology; hybrid Camry and fuel cell bus", 29 January 2015. http://www.greencarcongress.com/2015/01/20150129-toyotasic.html [Accessed October 17, 2016].)

[47] ARB 2011. California Air Resources Board. Initial Statement of Reasons: 2012 Proposed Amendments To The California Zero-Emission Vehicle Program Regulations. http://www.arb.ca.gov/regact/2012/zev2012/zevisor.pdf

[48] The Tesla Roadster was available in very limited quantities. In 2010, Tesla was not regulated under the ZEV regulation.

[49] The Mitsubishi Outlander is currently available outside of the U.S. but expected to launch in the U.S. in 2017.

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California accounts for approximately 48 percent of cumulative ZEV and PHEV sales in the U.S. from 2011 to June 2016, with approximately 50 percent of total U.S. BEV sales and 47 percent of total U.S. PHEV sales. While the absolute number of ZEV and PHEV sales grew by approximately 5.2 percent from 2014 to 2015, the overall market share has remained at approximately 3 percent of statewide LDV sales for 2015 and the first half of 2016.

The Section 177 ZEV States have accounted for approximately 10 percent of cumulative ZEV and PHEV sales in the U.S. from 2011 to June 2016, 11 percent of cumulative U.S. ZEV sales and 18 percent of cumulative PHEV sales. Sales of ZEVs and PHEVs in the Section 177 ZEV states grew rapidly in the first three years, but remained flat at approximately 0.5 percent of total LDV vehicle sales from calendar year 2013 through 2015. During that same time period, ZEV sales increased slightly to 0.2 percent of Section 177 ZEV state LDV sales. By contrast, PHEV sales, which started around 0.3 percent in 2013, fell to around 0.2 percent of Section 177 ZEV state LDV sales in 2015. Despite these past trends, sales of ZEVs and PHEVs are up to 0.6 percent in the Section 177 ZEV states for the first half of 2016, the highest level ever.[50]

ZEV infrastructure in California and Section 177 ZEV states has grown with substantial investments in the past several years, and accelerated investments are expected as new infrastructure efforts emerge. Over 17,000 Level 2 and 2,100 direct current fast charger (DCFC) connectors have been deployed across California and the nine Section 177 ZEV states.[51] Section 177 ZEV state infrastructure has outpaced vehicle deployment, with a higher connector per vehicle ratio than that found in California (refer to Appendix D for details). PEV infrastructure will continue to proliferate due to coordinated efforts through the ZEV Multi-State Task Force in the Section 177 ZEV states, and through California's Public Utility Commission (CPUC) implementation of Senate Bill (SB) 350 (Statutes 2015, 44258.5 section, De Leon author). California's current programs (most prominently legislation such as Assembly Bill 8, Statutes 2011, Section 41081, Perea author)) are enabling growth of the first major FCEV and hydrogen fueling markets in the U.S. Major policy and technical hurdles have been overcome in recent decades thanks to the coordinated efforts of State and industry partners. This substantial progress addresses issues of launching a new technology market. At the same time, stakeholders are also keenly aware of, and are addressing, new challenges in order to move FCEVs and hydrogen fueling into the mass-market.

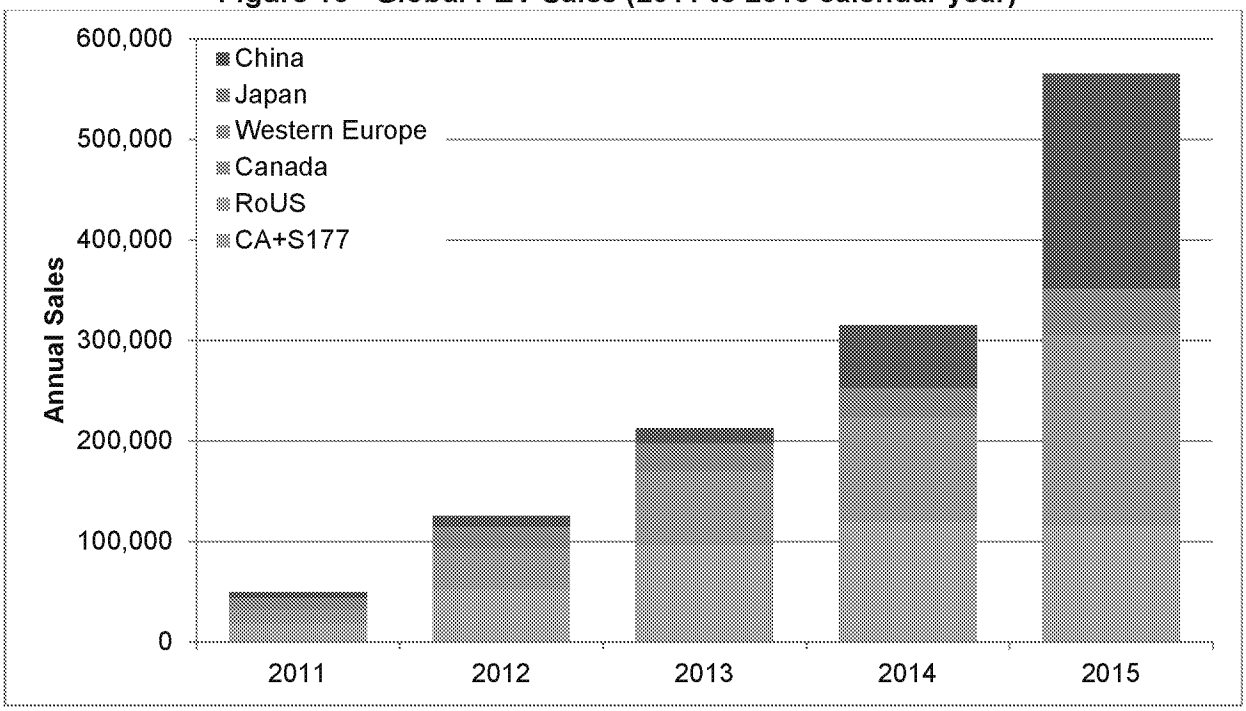
Where does California and Section 177 ZEV states fit into a growing global ZEV market?

The global PEV market has increased steadily since 2011, reaching over 500,000 annual units in 2015, with many nations proposing increased regulatory pressure to reduce carbon emissions from vehicles. It is expected that the total global PEV market will surpass a cumulative 2 million

[50] These sales data were calculated using "Dashboard Data", fully described in Appendix B, Section VII
[51] AFDC 2017. U.S. DOE Alternative Fuels Data Center, data as of 01/10/ 2017 http://www.afdc.energy.gov/fuels/electricity.html

vehicles by the end of this year (2016).[52] However, as shown in Figure 10 this growth recently has been concentrated in regions outside of the U.S., though cost reductions from economies of scales occur regardless of location. In 2015, China had the highest PEV sales followed closely by Western Europe; California with the Section 177 ZEV states most recently ranks as the third largest PEV market, surpassing the volumes in Japan and Canada combined.

Figure 10 - Global PEV Sales (2011 to 2015 calendar year)[53]



Why have sales in the U.S. stagnated in recent model years?

Fleet transformation to PHEVs and pure ZEVs requires not only auto manufacturers to develop and produce such vehicles, but also consumers to demand and ultimately purchase these products. Demand will be dependent on consumer awareness of the vehicles being offered as well as their characteristics – most notably vehicle price, available incentives, driving range, and infrastructure available for recharging/refueling – and how consumers value these attributes. In order for a consumer to purchase or lease a ZEV, they must first be aware that these vehicles are available in the market today. However, the results of independent studies all reveal a low level of ZEV awareness and confusion in California and the rest of the U.S. among the different ZEV technologies. In a 2016 UC Davis survey of new car buyers, over 34 percent of respondents across the U.S. could not name a single BEV available in the market.[54] Similarly,

[52] Carrington 2016. Damian Carrington. The Guardian Web Article. "Electric cars set to pass 2m landmark globally by end of 2016" https://www.theguardian.com/environment/2016/oct/13/electric-car-sales-set-to-pass-2m-landmark-globally-by-end-of-2016

[53] ANL 2016. Argonne National Laboratory. DOE Fact of the Week. March 28, 2016. http://energy.gov/eere/vehicles/fact-918-march-28-2016-global-plug-light-vehicle-sales-increased-about-80-2015

[54] Kurani 2016.

fewer than half of those polled in 2015 for an NREL study could name a PEV.[55] Looking at other factors, according to Californians surveyed, PHEV and BEV<200 consumers (BEVs with less than 200 mile range) seem dissatisfied with the electric range of their vehicle. The most common changes PHEV and BEV<200 owners would make to their vehicles is to increase the electric range for a higher price (48 percent and 57 percent) and to give up performance (power/acceleration) for higher electric range (25 percent and 33 percent).[56]

Additional factors, such as dealership availability and readiness or product diversity may also influence the rate at which market shares may grow. Although consumer choices for PHEVs and ZEVs are steadily increasing, they are still far outnumbered by a wide array of conventional technologies that may offer additional appealing characteristics such as lower prices, greater vehicle range, increased cargo and/or passenger capacity, and more attractive vehicle styling. Even for existing BEV drivers of all battery sizes, vehicle range ranked as their top concern during the shopping process, followed by vehicle price or availability of public charging infrastructure. While incentives and other policies may help consumers to overcome some of these concerns, others require further technological advances to satisfy customer requirements within acceptable price points.

However, eliminating barriers is not sufficient for growing a market as consumers also need to be persuaded to select a PHEV or ZEV. Among PEV drivers in California, Connecticut, and Massachusetts, saving money on fuel was the most common primary motivation for all PHEV and BEVx drivers as well as for BEV<200 drivers in California.[57] These results are consistent with sentiments from non-PEV drivers in a 2015 UC Davis survey of new car buyers that fuel savings, as well as other factors, would be one of their motivations for purchasing a PHEV or ZEV. Therefore, current relatively low gasoline prices create a challenging landscape, especially if utilities are not offering supportive discounts for vehicle charging or consumers are not aware of or opting into these reduced electricity rates. As a result, some consumers may actually spend more money today to operate their PEVs than they would an HEV or ICE.

Finally, an illustrative analysis of dealer inventories of PEVs and comparable vehicles shows there to be disproportionately more PEVs available on dealer lots in California than in Section 177 ZEV states. Whether these inventories reflect sales rates in those areas or automakers producing limited quantities of first generation products cannot be distinguished by evaluating this data.[58] Regardless, limited dealer inventories will reduce consumers' exposure to these vehicles and may contribute at least partially to the lower sales rates in the Section 177 ZEV States.

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[55] NREL 2016. National Renewable Energy Laboratory. Consumer Views on Plug-in Electric Vehicles – National Benchmark Report. January 2016. http://www.nrel.gov/docs/fy16osti/65279.pdf
[56] See Appendix B, Section VII for description of California's CVRP Ownership Survey 2015 results.
[57] See Appendix B, Section VII for description of California's CVRP Consumer Survey 2015, Massachusetts 2016 MOR-EV Rebate Survey, and Connecticut's 2016 CHEAPR Rebate survey results
[58] See Appendix B, Section II for staff's analysis of dealer availability, based on data collected from Edmonds.com

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Does staff believe sales will improve in the future?

Historically, there has been no single factor that is solely correlated to increased PEV sales. Rather, continued activity and progress from all parties – government at all levels, industry, and advocacy organizations – on a range of measures will each play a role in supporting, cultivating and expanding consumer interest to enable further market growth of ZEVs and PHEVs.

PEV owners are satisfied with their vehicle as over 92 percent of respondents in California would probably or definitely recommend their specific PEV model. Virtually all of the BEV200+ consumers (99.9 percent) would probably or definitely recommend their vehicle, as would 96 percent of PHEV and 93 percent of short range BEV consumers. As vehicle technology has matured, PHEV and BEV consumers become more likely to definitely recommend their specific PEV model. For example, the percentage of Nissan Leaf owners that would definitely recommend their vehicle jumped from 44 percent for those who purchased in 2012 to 66 percent for those who purchased in 2014.[56]

Already over 10 percent of recent PEV buyers (or lessees) are repeat buyers. Given the large proportion of leases, many consumers will be returning to the market within two to three years and among all current PEV drivers, more than 90 percent would replace their current PEV with a ZEV or PHEV. These existing, satisfied PEV consumers also serve an important function in educating other consumers in the market. According to survey results of recent California rebate recipients[59], another PEV driver is one of the most influential information sources for new buyers to choose a PHEV or BEV. So the greater the number of drivers coupled with other outreach initiatives, the faster consumer awareness will grow about these vehicles. When asked to design their next vehicle, 25-40 percent of new car buyers (almost exclusively conventional vehicle drivers) chose a PHEV, BEV, or FCEV.[60] Although these results do not represent a market forecast, they do serve as a measure of market potential that could be realized with the necessary complementary actions to eliminate barriers. Notably, there is no clear evidence that future market growth would only come from previous hybrid electric vehicle (HEV) buyers. From 2015-2016, about 80 percent of the PEVs in California are being sold to consumers with no prior PEV ownership, and among this group only 8 percent are either replacing an HEV or have an HEV as another vehicle in their household.[59]

Consumers cite a variety of factors that prevent their selection of a ZEV or PHEV, that are expected to diminish with time. The majority of all new vehicles sold in the United States start at a base price of less than $25,000, though with additional option packages the average retail selling price of all vehicles in 2015 was $33,000.[61] However, about half of the ZEVs and PHEVs sold in 2016 start at a base price over $35,000 before factoring in federal and state purchase incentives, while additional subsidies from auto manufacturers may reduce the price further still. Manufacturing developments and global economies of scale will facilitate cost reductions, while

[59] See Appendix B, Section VII for description of California's CVRP Consumer survey data.
[60] Kurani 2016.
[61] NADA 2016. National Automobile Dealers Association. Alternative Powertrains: Analysis of Recent Market Trends & Value Retention. April 2016. http://img03.en25.com/Web/NADAUCG/%7B49f71c70-31ef-4af9-870b-aeac4c6245bd%7D_201604_Alternative_Powertrains.pdf

continued government incentives can also help to offset the remaining incremental costs. Limited driving range, particularly of BEVs, as well as related infrastructure for charging or hydrogen refueling are also barriers to consumer adoption.[59,60] As more auto manufacturers introduce additional options, though, in different vehicle segments with increasingly greater electrification, consumers will be more likely to have an option that meets their needs, and within their budgets. Governments at multiple levels as well as some auto manufacturers are also working to deploy more PEV and FCEV fueling infrastructure to support these vehicles.[62] Concerns about long charging times are also anticipated to be resolved as auto manufacturers and suppliers have already announced advancements on charging speeds and energy storage that will soon be incorporated into product designs.[63]

What challenges lie ahead for ZEV market growth to continue?

While the market potential exists for increasing market shares of ZEVs and PHEVs, converting consumer interest into actual sales will still have challenges. The current market has benefited from a host of incentives which are set to expire eventually. These incentives have been effective in offsetting some of the incremental costs, and cost parity between ICEs and ZEVs or PHEVs for a self-sustaining market is not anticipated before 2025. The phase out of the largest of these incentives, the federal tax credit, will be staggered with the tax credit for FCEVs expiring on December 31, 2016 and the tax credit for PEVs phasing out for each manufacturer when it reaches 200,000 vehicles nationwide. Based on historic U.S. sales rates, at least four manufacturers would reach this threshold prior to 2025. Leading manufacturers General Motors and Nissan would reach first in 2022 followed by Ford and Tesla, though increasing sales of existing vehicles and introduction of new products would likely accelerate this timeline.[64] In California, sufficient funding for the state purchase rebate remains an annual uncertainty and recent modifications by the legislature to limit which consumers and vehicles qualify for a rebate may affect market growth. Incentive programs in Section 177 ZEV States have also faced funding shortages at times, and required increased funding.[65] Additionally, high-occupancy vehicle (HOV) lane access by single-occupancy ZEVs and PHEVs has been an effective incentive in many states; however, in California, current state law sunsets this access in 2019.

The high proportion of leased PEVs and FCEVs has accelerated the development of a secondary PEV market. Although analysis of used vehicle transactions and auction data shows limited net migration of PEVs between states, used vehicle prices of early model PEVs tended to be lower than HEVs but higher than ICEs.[66] Among the small number of low or moderate income participants in California's Enhanced Fleet Modernization Program purchasing PEVs, PHEVs and HEVs prices were similar, but an average of $7,000 more than the BEVs that were

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[62] See Appendix D for staff's infrastructure assessment.
[63] See Appendix C for staff's technology assessment.
[64] Calculated from historical sales trends discussed in Appendix B, Section III.A.2.c.
[65] MassEEA 2016. Massachusetts Department of Energy and Environmental Affairs. Press Release. "Baker-Polito Administration Increases Funding for Electric Vehicle Rebate Program by $2 Million" January 15, 2016 http://www.mass.gov/eea/pr-2016/increased-funding-for-electric-vehicle-rebate-program.html
[66] Based on analysis of Manheim Auction data. See Appendix B, Section VII for a complete description of Manheim Auction data.

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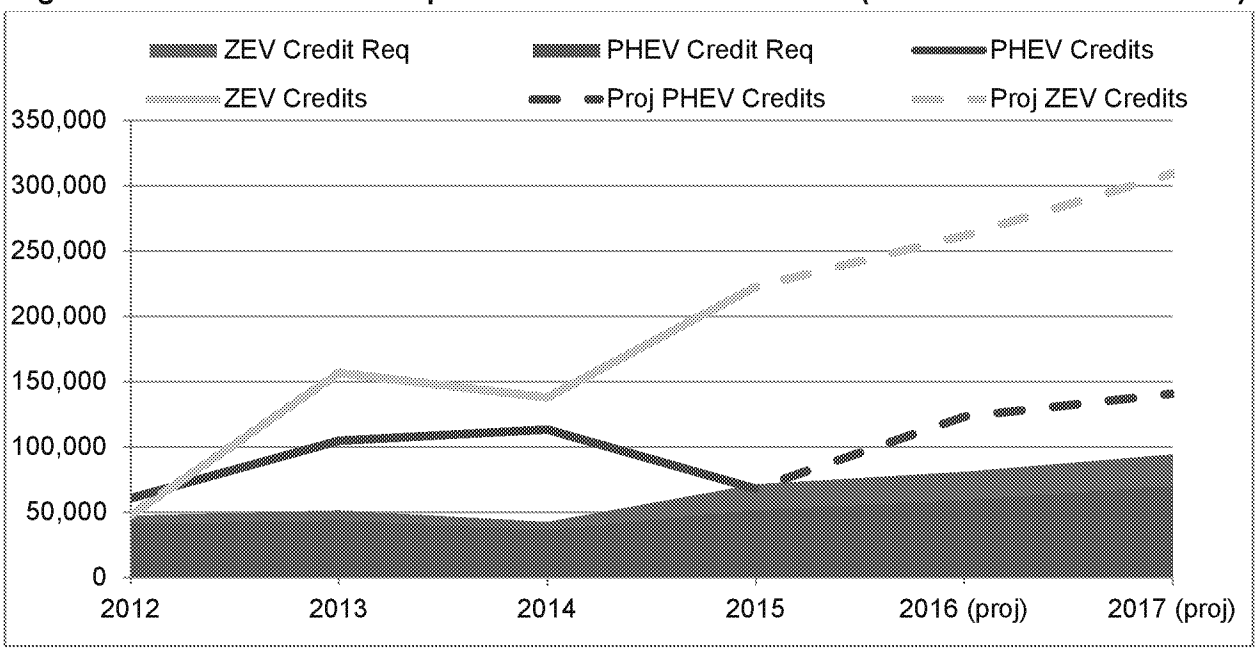
purchased. For the broader market, though, lower PEV prices seem to be correlated to selling at faster rates, suggesting that used vehicle sellers are still developing optimal pricing strategies.[67]

How have manufacturers complied with the ZEV regulation since the ACC 2012 rulemaking?

Since the 2012 ACC rulemaking, manufacturers have been over-complying with the ZEV regulation requirements as illustrated in Figure 11 by producing more ZEVs and PHEVs than needed. Likely, this is in preparation for the higher requirements set by the Board for 2018 and subsequent model years. However, this production of vehicles, and subsequent banking of credits has created some controversy, not unlike past reviews of the ZEV regulation. This topic will be discussed further in the following sections.

Figure 11 - Manufacturer Compliance Since 2012 Model Year (California and Section 177)



How have regulatory compliance scenarios changed as a result of the midterm review of the adopted standards?

The latest analysis has taken into consideration technology advancements, manufacturer compliance trends, ZEV regulation credit banks, and future product announcements and resulted in updated minimum regulation compliance scenarios. Compliance scenarios are intended to explain the potential effect various flexibilities and developing technology has on the overall number of vehicles expected from the regulation. These scenarios are "minimum

[67] Lee 2016. iSeeCars.com, Thomas Lee. Fastest-Selling Used Cars. July 18, 2016. http://blog.iseecars.com/2016/07/18/fastest-selling-used-cars/

compliance scenarios", which emphasizes the main goal of the ZEV regulation: to set a floor to ensure pure ZEV technology is being produced to help the technology reach commercialization. The question that these scenarios answer is how much could be expected (at a minimum) from the ZEV regulation in any given model year. These scenarios are not a market forecast of what actual total sales may be or will likely be in any given model year, but rather are regulatory compliance projections using the best available information at the time of this review.

Each new compliance scenario results in fewer vehicles than the expected compliance scenario prepared for the 2012 Board Hearing and a summary of staff's analysis can be found in Appendix A. Lower vehicle numbers are due mostly to longer electric range BEVs and PHEVs in every scenario, meaning each vehicle is earning more credit (in some cases twice as much) than originally projected. As pure ZEVs generally earn more credits per car than PHEVs, this change in assumptions directionally resulted in higher ZEV penetration, lower PHEV penetration, and lower overall ZEV and PHEV combined volumes in the new scenarios.

In the new minimum compliance scenarios, the analysis takes into consideration historical credits, a change from past compliance scenarios. To address the issue of credits more directly, credits exist in manufacturers' credit banks due to vehicles being produced. Historically, the majority of manufacturers have carried a two to three year compliance margin from one year to the next. This factor is reflected in the updated compliance scenarios. A "credit balance" assumption was developed for each compliance scenario based on the number of credits manufacturers would leave in their banks relative to what would be needed for 2026 and subsequent model year compliance. Previously earned ZEV credits in excess of this assumed balance would be spread out evenly across the 2018 to 2025 model years to reduce the manufacturer's obligation for those years. The other assumptions made for each compliance scenario followed general themes related to the pace of technology development and market uptake. Below is a summary of each compliance scenario staff developed for this assessment.

Table 11 - Staff ZEV Regulatory Compliance Scenario Themes

Scenario	Theme
Mid-Range ZEV-Technology Case	Continued advancement in ZEV technology leads to balance of new sales of improved capability ZEVs and moderate use of banked ZEV and GHG credits
Slow ZEV-Technology Case	Delayed advancement in ZEV technology leads to higher dependence on banked ZEV and GHG credits to support sales of only slightly improved ZEVs
High ZEV-Technology Case	Aggressive advancement in ZEV technology leads to larger increase in new sales of highly capable ZEVs as dominant mechanism for compliance

Results from the mid-range scenario for California and Section 177 ZEV states are shown in Figure 12 and Figure 13 below for the 2018 through 2025 model years only.

Figure 12 - Sales from mid-range scenario for ZEV regulatory compliance (California)

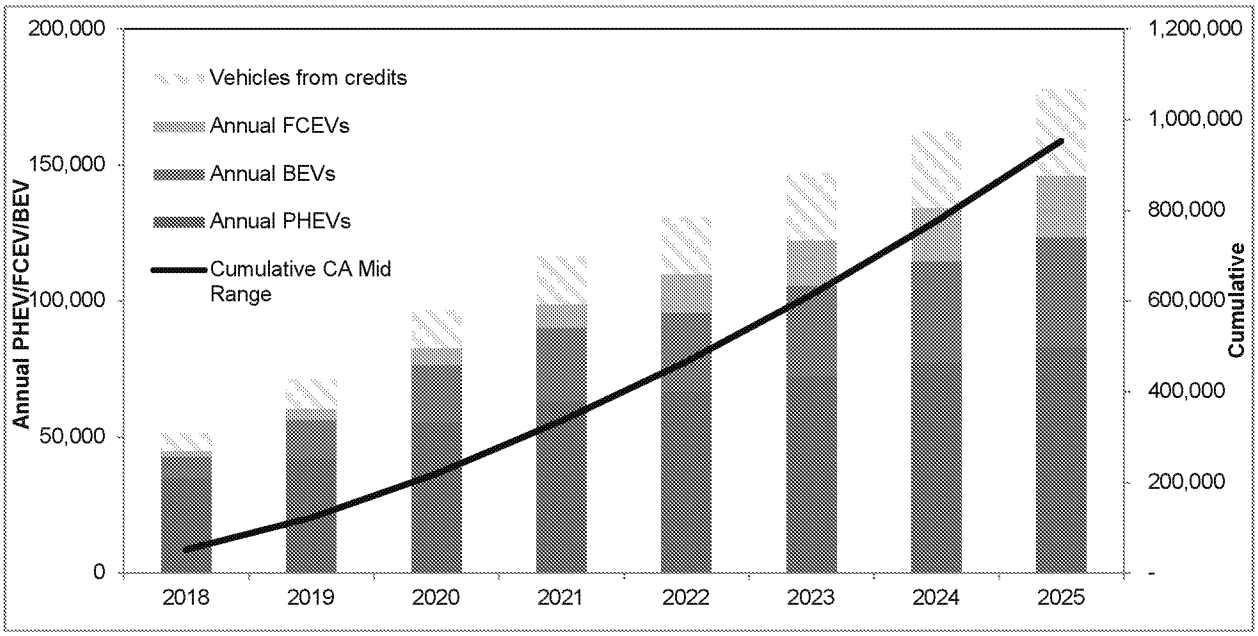
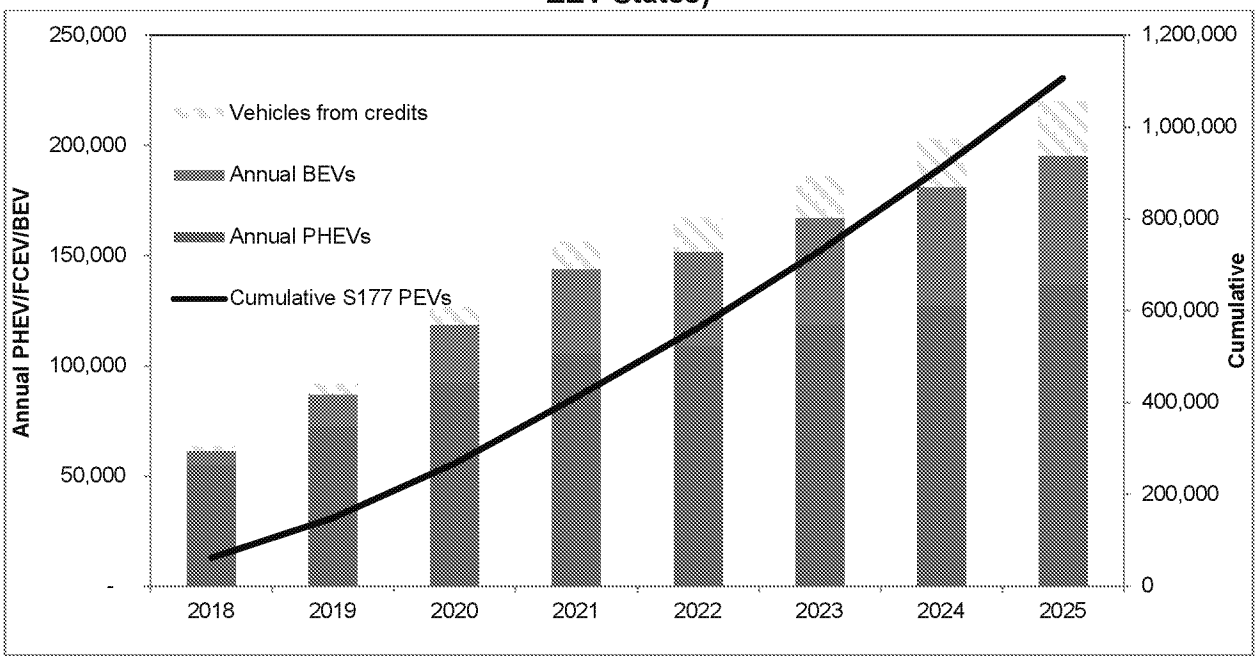


Figure 13 - Sales from mid-range scenario for ZEV regulatory compliance (Section 177 ZEV States)



Through 2015 model year, 182,000 ZEVs and PHEVs have been registered in California, according to Department of Motor Vehicles' registration data. Extrapolating for 2016 and 2017 model years, approximately 165,000 additional ZEVs and PHEVs are expected for the following two model years. Taking these pre-2018 vehicle numbers and adding them to staff's mid-range

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regulatory compliance scenario, nearly 1.2 million cumulative ZEVs and PHEVs can be expected by the 2025 model year.

How will historical ZEV credit banks effect future compliance with the ZEV regulation?

As an industry, manufacturers have been over complying with the ZEV regulation since the early years of the program. There are some manufacturers that have complied early and generated ZEV credits and some have bought credits to meet the requirements. In the early years, the Board awarded a large number of credits to jumpstart a very early technology market. To help manufacturers meet the requirements in the Section 177 ZEV states, the Board adopted the travel provision. These early credits provide insurance to the manufacturers for future requirements.

Starting in 2018 model year, the requirements have a steep ramp in the ZEV credit requirements. Also, during the 2012 rulemaking, staff addressed other concerns regarding credits by simplifying the overall credit structure. For example, the travel provision will no longer be applicable for BEVs, and credits generated per vehicle have been reduced.

Manufacturer credit banks will continue into the future, and in some cases, those banks will be representative of technology and market success. However, what is also certain is that there will be some market failures. Over the past four model years, products have already been released in the market, pulled back, revamped, and re-released due to market response to the technology.[68] It could be argued, though, that credit banks provide space for manufacturers to innovate, and overall the market will benefit from improved products. As ARB re-evaluates the requirements for 2026 model year and beyond, the agency will consider credit structure revisions including taking into account the status of the credit banks at that time and regulatory provisions such as PHEV and BEV qualification criteria, credits per vehicle, credit lifetime, and credit usage limitations.

Is electric vehicle miles traveled (eVMT) or zero-emission vehicle miles traveled (zVMT) an appropriate credit metric for the ZEV regulation?

For 2018 and subsequent model years, PHEVs are credited on a linear scale (between 0.4 and 1.3 credits) based on the certified electric range on the urban dynamometer drive schedule (UDDS). One alternative factor suggested for consideration is electric vehicle miles traveled or eVMT. This is the portion of total vehicle miles that are attributed to electric power instead of gasoline, and therefore correlates with the GHG benefit of such a vehicle.

According to the analysis presented here, eVMT data is highly variable and dependent more on user behavior (driving, charging) than the vehicle itself (its inherent range or motor size).[69]

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[68] Edelstein 2015. Stephen Edelstein. Green Car Reports. "Toyota Prius Plug-in Production to end in June; New One Coming Next Year" May 5, 2015. http://www.greencarreports.com/news/1098145_toyota-prius-plug-in-production-to-end-in-june-new-one-coming-next-year

[69] See Appendix G for more information on staff's analysis of manufacturer provided data from PEVs.

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Though manufacturers have presented average eVMT numbers, data provided by the manufacturers to ARB show increasing overall VMT with unchanging eVMT each year for some models. According to early data received from General Motors[70] during the EV Project, 72 percent of the Volt miles qualify as eVMT. However, according to more recent General Motors data sources,[71] the eVMT percentage for the Volt is actually closer to 60 percent. At this time, there is significant uncertainty as to how this percentage will increase or decrease with increasing infrastructure,[72] increased electric range for 2016 and subsequent Chevy Volts, fluctuating electricity and gasoline prices, or an expanding consumer base including customers who may not be as highly motivated to plug in as the earliest adopters.

Further, eVMT only has a strong correlation to a vehicle's GHG emission benefit, but not to its criteria pollutant emission benefits. In the case of the Volt, according to manufacturer provided data, only 59 percent of a Volt's miles would qualify as zero-emission VMT (zVMT), meaning the percent of total miles from trips without any engine operation (and the associated criteria pollutant emissions such as HCs and NOx). PHEVs with longer ranges and higher motor output power (Chevy Volt) do provide greater criteria pollutant benefits than blended-type PHEVs (Ford Fusion PHEV, Toyota Prius Plug-In). However, as illustrated in Figure 14, all PHEVs have lower zVMT than eVMT suggesting the criteria pollutant benefits relative to a BEV are not as great as the GHG benefits.

According to the analysis in Appendix I, it is not clear how changing to an eVMT (or zVMT) metric would better help California and the Section 177 ZEV states to meet long term criteria pollutant and GHG emission reduction goals than the current credit system. The current UDDS based system for 2018 and subsequent model years lines up well with an eVMT based system, especially when compared to a ~100 mile UDDS certified BEV.[73] And when compared to a zVMT based system, many PHEVs are likely currently over credited. The following Figure 14 shows a comparison of vehicles based on these various metrics.

[70] Data received from GM was from Volts in the EV Project. See Appendix G for more information.
[71] Data based on in-use Volts from the most recent model years.
[72] See Appendix D for more information on electric vehicle infrastructure roll out.
[73] See Appendix I for staff's full analysis on alternative credit structures.

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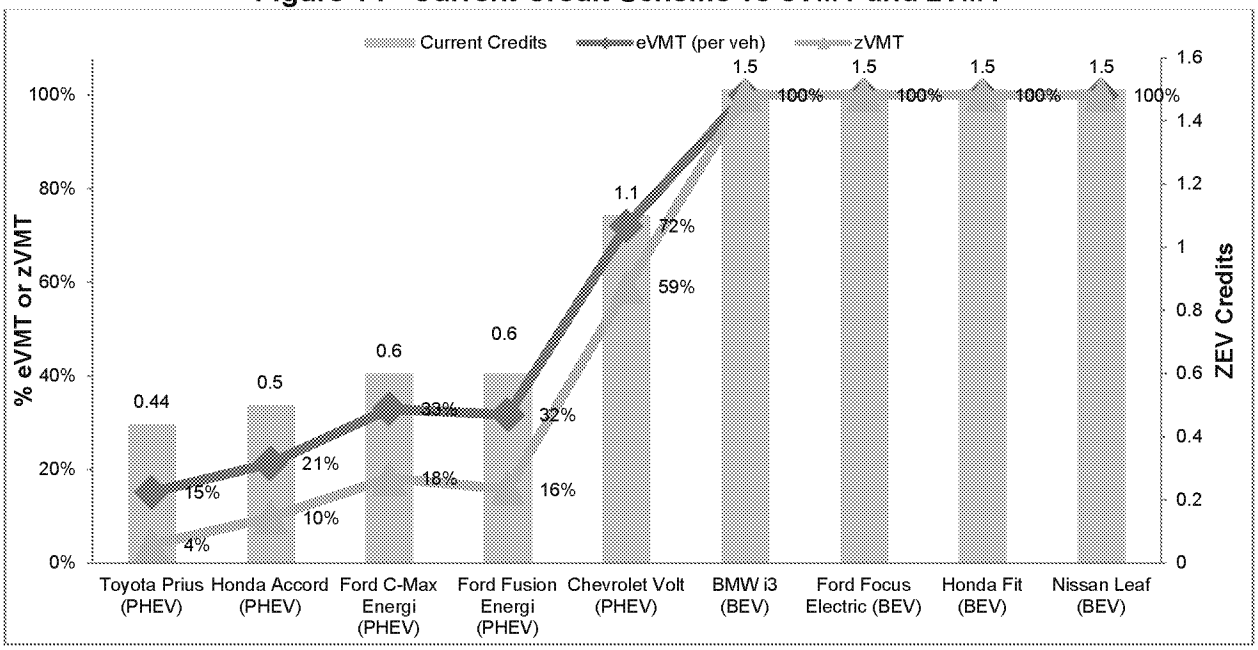
Figure 14 - Current Credit Scheme vs eVMT and zVMT



Range determined over the UDDS cycle does credit what matters to the consumer: the vehicle's electric range. In a 2015 survey of BEV and PHEV drivers, among those responding that they would likely replace their current vehicle with a PHEV, current PHEV drivers indicated an average desired all-electric range of 40-50 miles for their next PHEV while almost all current BEV drivers indicated a desired range of around 80 miles for their future PHEV.[56] Other ARB and U.S. EPA GHG and criteria pollutant standards reward PHEVs for their environmental benefits while the technology-forcing ZEV regulation credits PHEVs based on an attribute that advances technology and supports consumer acceptance and market expansion: all-electric range.

Should manufacturers be allowed to comply with more PHEVs for the 2018 through 2025 model years than already allowed in the regulation?

No. It is often asserted that PHEVs can appeal to a broader population and serve as a transition to pure ZEV technology and, therefore, should be allowed to play a larger role in compliance with annual ZEV requirements. And as noted earlier, the updated VISION scenarios in the Mobile Source Strategy indicated approximately one-third of the total ZEVs could be PHEVs on a path to meeting 2050 targets. However, while the share of PHEVs can undoubtedly be larger than that, the sensitivity analyses presented in Appendix F demonstrate conclusively that there are both GHG and criteria pollutant consequences from a much higher share of PHEVs along with increased risk given the uncertainty in how consumers will use these vehicles. As shown in the new minimum compliance scenarios, PHEVs are projected to make up more than 60 percent of all ZEVs on the road by 2025 even with the current caps on PHEV credits. Further, banking and trading provisions already exist that would allow manufacturers with excess PHEV generated credits to bank them for future use or perhaps trade with other manufacturers that have not fully utilized their PHEV credit allowances. Combined, this provides sufficient flexibility in the current regulatory structure as the ZEV market is developing

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to determine the role PHEVs will ultimately play. Therefore, this new analysis does not support the need for more flexibility for PHEVs at this time such as allowing manufacturers to comply with more PHEVs than currently allowed.

What is the likelihood that the ZEV requirements adopted in 2012 can be met in the Section 177 ZEV states?

Sales of ZEVs and PHEVs in the Section 177 ZEV states lag behind California's market. Many stakeholders point to regulatory flexibilities, such as the travel provision and the existence of banked credits, as part of the cause in holding back sales in the Section 177 ZEV states. These could be factors resulting in lower sales; however, not all states are performing the same. Oregon has a strong ZEV market, just behind California at 2 percent of LDV sales. The market potential for ZEVs and PHEVs in the Section 177 ZEV states exists,[74] and is slowly increasing through a combination of government support, increased awareness, and expanded product offerings. Much of the support for complementary policies in the Section 177 ZEV states has developed within the past 3 years, after the adoption of the Multi-State ZEV Action Plan.[75,76]

Recognizing the market development in the Section 177 ZEV states was not yet as far along as California's, the Board adopted additional regulatory flexibilities and lead time to create a ramp into the 2018 and subsequent model year requirements for the states. These flexibilities include reduced credit obligations in the Section 177 ZEV states, spread out over 6 model years,[77] and the ability to focus regionally on deliveries of PHEVs and ZEVs, rather than state by state.[78] Additionally, credits both created in the Section 177 ZEV states and generated through the travel provision will help manufacturers who need more time to build a market for their vehicles between 2018 and 2025 model years.[79]

Do intermediate volume manufacturers need different treatment in the ZEV regulation?

In 2012, the Board adopted policies that required intermediate volume manufacturers (IVM) to begin electrifying their fleet starting in 2018. These policies redefined many of the mid-sized manufacturers (Daimler, BMW, Hyundai, Kia, and Volkswagen) as large volume manufacturers (LVM), and allowed the remaining IVMs (Subaru, Volvo, JLR, Mitsubishi, Mazda, and Tesla) to meet their 2018 through 2025 model year requirements exclusively with PHEVs. The Board adopted additional flexibilities in 2014 for the remaining IVMs, ensuring these manufacturers would remain defined as IVMs through 2025 model year, and granted more time to comply with

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[74] Kurani 2016.
[75] Action Plan 2014. Multi-State ZEV Action Plan. May 2014. http://www.zevstates.us/about-us/, click on "Multi-state ZEV Action Plan" link
[76] MOU 2013. Memorandum of Understanding. October 24, 2013, Can be accessed and downloaded http://www.zevstates.us/about-us/ , click on "Memorandum of Understanding" link
[77] CCR Section 1962.1(d)(5)(E)3. and 1962.2(d)(5)(E)1.
[78] CCR Section 1962.1(d)(5)(E)3.a and b., and 1962.2(d)(5)(E)1.a.i. and ii.
[79] See Appendix A for staff's analysis of ZEV regulation compliance scenarios

ED_001276_00004660-00057

their ZEV requirements. In Resolution 15-07, the Board directed staff to continue to evaluate the issue of regulatory stringency during its midterm review process.[80]

Consultations were held with all but one IVM (Mazda) during the mid-term review process.[81] Manufacturers confirmed various plans to full compliance with the regulation as adopted, and are pursuing both PHEV and ZEV models, some recognizing it will be almost impossible to meet their obligations exclusively with PHEVs. Many of the flexibilities adopted in prior rulemakings adequately met many of the IVMs' concerns. The following table lists the various flexibilities already available to IVMs for the 2018 through 2025 model year ZEV requirements.

Table 12 - IVM ZEV regulatory flexibilities

Applicable Model Years	IVM Flexibility
2018 and 2019	Allowed to meet full requirements with converted partial zero-emission vehicle (PZEV) and advanced technology PZEV (AT PZEV) credits
2018 and 2019	Additional "revenue test" to be able to qualify as IVM instead of LVM
2018 and subsequent model years	Can meet full requirement with PHEV credits
2018 and subsequent model years	Are allowed 3 model years to make up a credit deficit, and deficit can be fulfilled with PHEV credits
2018 through 2022 model years	Allowed to participate in "pooling" in Section 177 ZEV states
2018 and subsequent model years	If average sales grow above 20,000, are allowed 5 years to transition to LVM requirements

These flexibilities adopted by the Board addressed many concerns raised by the IVMs. More importantly, these manufacturers do have competitive products in the market and generally agree that they will need to develop and introduce ZEV technologies to ensure they remain competitive into the future. All five current IVMs have clear and concrete plans to bring ZEVs to market in the next few years, with relevant announcements for Mazda and Subaru made as recently as November 2016.[82] Additionally, as shown in the new compliance scenarios, there are sufficient credits, both in their own banks and in the market, available for IVMs to help bridge any interim compliance gaps.

[80] ARB 2014. California Air Resources Board. Resolution 15-07. May 21, 2015 https://www.arb.ca.gov/regact/2014/zev2014/res15-7.pdf
[81] Mazda declined to meet with ARB staff regarding the review of the ZEV regulation.
[82] Greimel 2016. Hans Greimel. Automotive News, " Japan's holdouts begin to embrace EVs". November 27, 2016 http://www.autonews.com/article/20161127/OEM/311289914/japans-holdouts-begin-to-embrace-evs

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Are the ZEV requirements in California, as adopted in 2012, appropriate for continuing to help develop the ZEV market?

Yes. The analysis reported here found that maintaining the adopted requirements for California through 2025 model year including the existing regulatory and credit structure is appropriate. In 2012, the Board successfully strengthened the ZEV regulation, nearly tripling the requirements for the 2018 through 2025 model years, and shifting away from stair-step requirements (where requirements remained the same for three years at a time) to annual increases in the requirements. Since then, the regulation has been achieving the goal of accelerating development of ZEV technology towards commercialization in California as demonstrated by the growth in the ZEV market, the introduction of more capable and longer range vehicles than originally projected, and earlier reduction in battery costs than anticipated. The 2012 Board action has resulted in over 215,000 ZEVs and PHEVs being placed in California over the last five model years. The transformation of the light-duty fleet has begun. Not only are manufacturers over-complying with the ZEV regulation in preparation for higher 2018 and subsequent model year requirements, manufacturers are delivering ZEVs and PHEVs in states which have not adopted California's ZEV regulation, indicating that the industry is starting to shift towards greater electrification. Manufacturers are competing with each other for PEV consumers by continually refining the products they offer to suit consumer preferences. When asked, consumers have stated a desire for more electric range and more electric drive capability. Manufacturers have responded with more range and, instead of continuing to make vehicles with limited range and capability that barely meet ZEV regulation requirements, will be offering over 70 unique models over the next five model years, in almost every segment (vehicle size class) as illustrated in Figure 15.[83]

[83] See Appendix C for staff's analysis on future expected model offerings.

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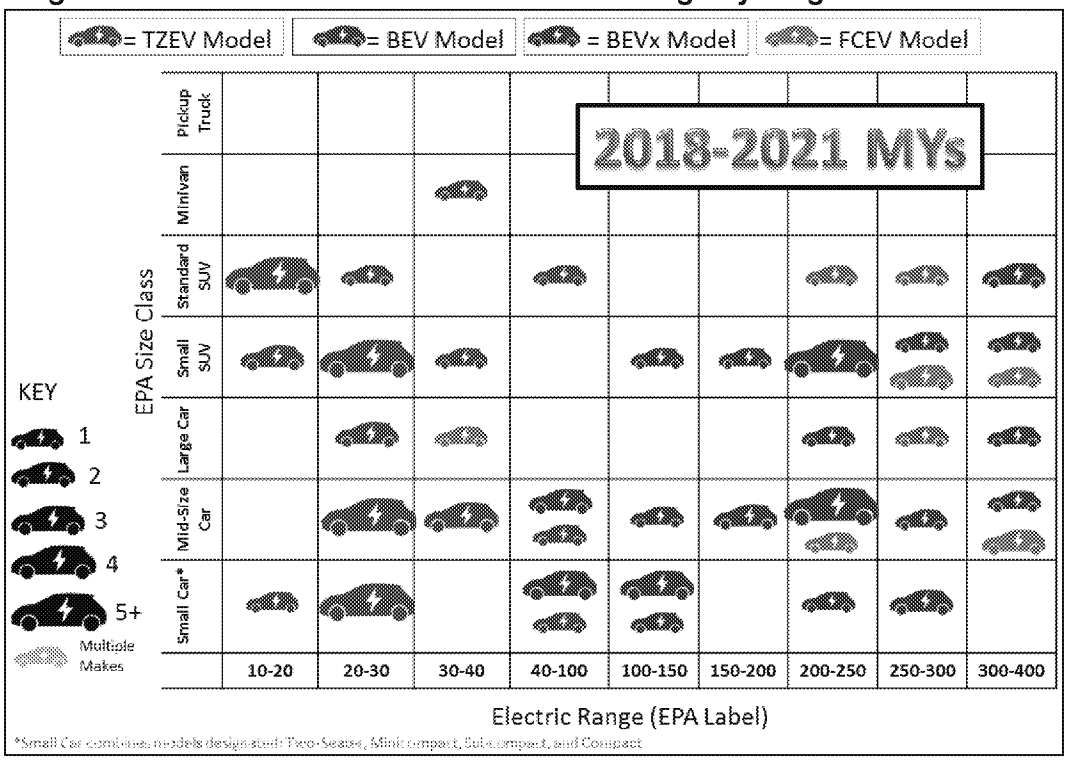
Figure 15 - Future ZEV and PHEV model offerings by range and size class



As a result of these vehicle technology advancements, the updated minimum compliance scenarios project approximately 1.2 million cumulative sales of ZEVs and PHEVs by 2025 in California. While this number might reflect a lower volume of vehicles needed for compliance than originally projected in 2012, the resultant improvements in ZEV and PHEV attributes, such as all-electric range and vehicle price, will be better vehicles expected to further broaden the appeal of these vehicles beyond the initial consumers and help achieve necessary future market expansion.

Despite the noted successes to date, the ZEV and PHEV market is in the early stages of development. The market is rapidly changing with nine BEV and PHEV models already discontinued since their introduction and it is also unknown how many of the 70 unique models will succeed in the market. The current market has benefited from multiple purchase incentives that have substantially discounted ZEVs and PHEVs such that their prices are more aligned with those of conventional vehicles. But, between 2018 and 2025, these and other incentives are expected to phase out. While decreased reliance on incentives is essential for building a self-sustaining market, it is unclear what consumer response will be without purchase and other incentives (like high occupancy vehicle (HOV) lane access). Consumer awareness of ZEVs is still low and top motivations like saving money on fuel are less influential as gasoline prices remain low. Given the market uncertainties that still exist in these early years, regulatory stability of the 2018 through 2025 model year standards can help ensure a continued path of increasing, but achievable, ZEV volumes.

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Based on the midterm review, what ZEV regulatory changes does the new analysis suggest?

For the first time since the initial adoption of the ZEV regulation, the Board adopted increased ZEV credit requirements in 2012. This action, in concert with the development of strong comprehensive complementary policies to support infrastructure deployment and consumer awareness, led to the advancement of ZEV technology and growth in ZEV sales. Building on these strong trends, the new analysis supports a strengthening of the ZEV program for 2026 and subsequent model years to continue on the path towards meeting California's 2030 and later climate change and air quality targets. A rulemaking initiated by 2018 would target credit provisions, the current regulatory structure, and other changes to increase certainty on future vehicle volumes and reconsider PHEV qualifications[84] and credits to ensure maximum GHG and criteria pollutant reductions are achieved. Development of future ZEV requirements would also need to be coordinated with new GHG (and potentially criteria pollutant[85]) fleet-wide emission reduction requirements as was previously done in the 2012 ACC program where all three elements were simultaneously addressed. This comprehensive approach ensures the regulations are complementary and coordinated for the synergistic effects into a new vehicle policy to help meet California's air quality and GHG goals. To this end, ARB intends to continue to collaborate on a technical basis with its federal partners like the U.S. DOE to promote the advancement of ZEV technologies needed for ARB's long term goals and the U.S EPA and NHTSA to evaluate evolving conventional and electrified vehicle technologies to build on the existing GHG standards and pursue continued reductions in the national GHG standards for 2026 and subsequent model years.

Modeling to meet the 2030 GHG targets established by SB 32 in the ARB Mobile Sources Strategy report, released in May 2016, indicates approximately three million additional ZEVs and PHEVs will be needed in 2026 through 2030. To reach these volumes with any certainty, the new regulation will need modifications that provide a more direct connection to vehicle volumes and require vehicle characteristics that best ensure market success. For such significant revisions to the regulation to be successful, however, it would require greater market acceptance, more technology advancements, and lower technology costs than is known with certainty today. In PHEVs alone, the product offerings and architecture variations are increasing in diversity and it is too early to determine which combinations will be appealing to consumers while providing maximum GHG and criteria pollutant benefits. For BEVs, a step change is occurring with multiple offerings expected with 200+ miles of range at prices closer to mainstream conventional vehicles (even before state and federal incentives), with the first of these being launched within weeks of this report's release. Additionally, substantial changes to the regulatory structure will impact vehicle manufacturer product and compliance planning and

[84] For example, California Senate Bill 859 recently revised the PHEV eligibility criteria for consumer rebates (CVRP) to a minimum of 20 miles of electric range rather than the 10 mile minimum range in ARB ZEV regulations necessary to qualify for ZEV credits.

[85] Stronger LEV criteria pollutant fleet emission standards will also be considered as the state implements SIP strategies for the 2031 ambient air quality requirements, in addition to later attainment dates for the new ozone standards.

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necessitate sufficient lead time and stability to implement successfully while minimizing disruption to research, investment, and design cycles.

Since the adoption of the 2018 through 2025 model year standards, manufacturers have been exceeding the annual requirements of the ZEV regulation and expanding the market nationwide by delivering ZEVs and PHEVs in states which have not adopted California's ZEV regulation. Thus, committing now to a strong set of post-2025 requirements reinforces current progress and encourages manufacturers to further advances to electrify their fleets. Stronger post-2025 requirements will inherently influence the last model years before 2025 as manufacturers take actions to stay ahead of the requirements with some compliance margin. In the interim, ARB and interagency efforts should be made to help accelerate infrastructure deployment, increase consumer awareness, improve dealer knowledge, and preserve incentives. Staff will also continue to assess the development of the ZEV and PHEV market, battery and fuel cell technology, PEV and hydrogen infrastructure, the nexus with autonomous and car sharing transportation developments, the proliferation of complementary policies, and the overall environmental and economic impact of this emerging market.

What are some alternative regulatory and non-regulatory changes that the Board could consider prior to 2026 model year?

The analysis of the midterm review fully support the conclusion to focus on substantial new regulatory action for model year 2026 and beyond to increase certainty on future vehicle volumes while maintaining the existing requirements through 2025. As noted earlier, manufacturers are currently producing more vehicles than the regulation requires and, at least in part, it is because of the more stringent requirements starting in 2018 model year. In 2018, changes to the credit structure cause most vehicles to earn fewer credits per car as well as the overall requirement to increase in stringency every year from 2018 to 2025. Likewise, if the changes for 2026 result in increased stringency through structure and/or credit changes as intended, it is logical to assume that manufacturers would be similarly motivated to over-comply, or perhaps 'early-comply', in the years leading up to 2026 model year and result in increased vehicle volumes before 2026.

However, at the July 2016 hearing, the Board requested additional analysis by staff to address concerns around ZEV credits and increasing the number of ZEVs on the road prior to 2026 model year. The alternatives staff has considered include: a) increasing the ZEV requirement percentages for the final year of the current program (2025 model year); b) creating a credit usage restriction that may, for example, require a fraction of any model year's compliance be from vehicles produced in that model year or by that manufacturer; c) increasing the cap on PHEV credits allowed, but requiring additional PHEVs to have increased electric range and electric drive capability; and d) increasing the ZEV requirements for the 2023-2025 model years with a focus on requiring additional pure ZEVs. Given the need to provide sufficient lead time following any formal rulemaking approval, the additional vehicles resulting from these alternatives could be minimal relative to production levels in anticipation of future requirements for 2026 model year and beyond. Furthermore, the flexibility provided by credits, even with

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restrictions, would not necessarily require manufacturers to alter product plans to comply with increased requirements.

Non-regulatory actions will be just as critical as the ZEV regulation requirements in bolstering demand for ZEVs. Studies such as recent International Council on Clean Transportation (ICCT) research[86] highlight historical correlations between existing ZEV sales and current regional market support actions (e.g., infrastructure, consumer campaigns, etc.). However, such relationships will continue to be dynamic and staff intends to evaluate changing market conditions to inform future decisions which may include contracts for external research to support this analysis.

Staff intends to continue to evaluate the market, including the effectiveness of complementary policies, over the next few years to help inform future regulatory proposals and to better quantify what is needed to support further development of the ZEV and PHEV market. The Low Carbon Transportation and Fuels Investments and Air Quality Improvement Program (AQIP) Funding Plan for fiscal year 2016 -2017 discussed potential indicators for assessing a self-sustaining market in accordance with SB 1275. These indicators include: new ZEV and PHEV sales, battery and fuel cell technology advancements and costs, infrastructure development, product diversity, the used market for ZEV and PHEVs, consumer awareness, avoided health impacts, and consumer willingness to pay.[87] Evaluation of these and other indicators, such as consumer purchase motivations, vehicle attributes, energy prices, and cumulative installed battery capacity, will help to assess the overall health and potential of the ZEV and PHEV markets in California and Section 177 ZEV States going forward.

Summary

The electrification of the light-duty fleet has begun. The ACC regulations, as adopted in 2012, continue to push manufacturers to produce more efficient and cleaner vehicles than ever before, and will continue to do so for years to come. Consistent with the draft 2016 TAR and Final Determination, updated analysis confirmed that the technology is available to readily meet, if not exceed, the current 2022 through 2025 model year national GHG emission standards at the same or lower cost than originally projected when the standards were adopted in 2012, predominantly with advanced gasoline engines and transmissions. Building on the staff's 2015 report to the Board on the feasibility of measurement at low PM emission levels, additional emission testing and a review of vehicle PM emission control technology was conducted by staff and determined that compliance with the 1 mg/mi emission standard by 2025 model year is feasible and that manufacturers are on track to meet this standard.

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[86] ICCT 2016, International Council on Clean Transportation. "Sustaining Electric Vehicle Market Growth in U.S. Cities," October 2016. http://www.theicct.org/leading-us-city-electric-vehicle-2016

[87] ARB 2016d. California Air Resources Board. Proposed Fiscal year 2016-17 Funding Plan for Low Carbon Transportation and Fuels Investments and the Air Quality Improvement Program. May 20, 2016 https://www.arb.ca.gov/msprog/aqip/fundplan/proposed_fy16-17_fundingplan_full.pdf

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The ZEV regulation, significantly revised in 2012, continues to play a critical role in transitioning the vehicle fleet to achieve California's long term air quality and GHG goals and has resulted in hundreds of thousands of ZEVs and PHEVs being placed in California over the last five years. Not only are manufacturers over-complying with the ZEV regulation in preparation for higher 2018 and subsequent model year requirements, manufacturers are delivering ZEVs and PHEVs in states which have not adopted California's ZEV regulation.

As described in the Executive Summary above, and expanded upon throughout this report, the following recommendations have been prepared by staff for the Board's consideration in the California Midterm Review.

2022 through 2025 model year GHG emission standards

- Continued participation in the National Program by maintaining the "deemed to comply" provision allowing for compliance with the adopted U.S. EPA GHG standards for 2022 through 2025 model years.

1 milligram per mile particulate matter emission standard

- As previously reported to the Board in 2015, maintain the existing PM measurement method for the 1 mg/mi standard.
- Maintain the stringency and implementation schedule of the adopted 1 mg/mi PM standard scheduled to begin in 2025 model year.
- Initiate regulatory action to develop and adopt additional PM standards to phase-in with the 1 mg/mi standard in 2025 model year to ensure manufacturers implement robust control strategies that result in low PM emissions in the real world.

California's ZEV regulation

- Strengthen the ZEV program for 2026 and subsequent model years to continue on the path towards meeting California's 2030 and later climate change and air quality targets.
- Maintain the adopted requirements for California through 2025 model year including the existing regulatory and credit structure.
- Maintain the existing ZEV requirements and flexibilities, including as amended in 2014, for IVMs.
- Maintain the existing ZEV regulation credit structure and caps for PHEVs through the 2025 model year.
- Maintain the ZEV regulation and flexibilities for the Section 177 ZEV states.
- Continue efforts by ARB and other stakeholders to accelerate and expand non-regulatory complementary policies that have been identified as successful in building market demand and removing remaining barriers to ZEV adoption.

Given the conclusion of the federal midterm evaluation process with the decision by U.S. EPA to maintain the adopted GHG standards in the Final Determination, ARB will remain engaged with U.S. EPA and NHTSA in support of continued participation in the National Program. Additionally, the agency will continue rigorous efforts to promote complementary policies that support the expanding ZEV market. Simultaneously, ARB will begin new multi-year technical

ED_001276_00004660-00064

and market analysis to inform an expected rulemaking for the 2026 model year and beyond. In these efforts, ARB intends to build on its history of technical collaboration with federal agencies including U.S. DOE, U.S. EPA, and NHTSA in furthering the development and deployment of advanced vehicle technologies necessary for California's GHG and clean air targets. ARB also recognizes the value of a continued national program for GHG standards and plans to continue to coordinate with EPA and NHTSA in the development of future standards.

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LIST OF ACRONYMS AND ABBREVIATIONS

AEO:	Annual Energy Outlook
ARB:	California Air Resources Board
BEV:	Battery electric vehicle
CAFE:	Corporate Average Fuel Economy
CAV:	Connected and autonomous vehicles
CCR:	California Code of Regulations
CD:	Charge-depleting
CO_2:	Carbon dioxide
DSF:	Dynamic Skip Fire
EGR:	Exhaust gas recirculation
EIA:	Energy Information Administration
eVMT:	Electric vehicle miles traveled
FCEV:	Fuel cell electric vehicle
FTP:	Federal Test Procedure
GDI:	Gasoline direct injection
GHG:	Greenhouse gas
g/mi:	Grams per mile
GPF:	Gasoline particulate filter
HC:	Hydrocarbons
ISOR:	Initial Statement of Reasons
IVM:	Intermediate volume manufacturer
LDV:	Light-duty vehicle
LEV:	Low-emission vehicle
mg/mi:	Milligrams per mile
mpg:	Miles per gallon
MTR:	Midterm review
MY:	Model year
NHTSA:	National Highway Traffic Safety Administration
NMOG:	Non-methane organic gas
NOx:	Oxides of nitrogen
NVH:	Noise, vibration, and harshness
PEV:	Plug-in electric vehicle
PFI:	Port Fuel Injection
PHEV:	Plug-in hybrid electric vehicle
PM:	Particulate matter
ppb:	Parts per billion
Section 177 ZEV states:	States that adopt and enforce California's ZEV regulations under Clean Air Act (CAA) Section 177
SJV:	San Joaquin Valley
SULEV:	Super-ultra-low-emission vehicle
SUV:	Sport utility vehicle
TAR:	Technical Assessment Report
TPD:	Tons per day

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TZEV:	Transitional zero-emission vehicle
UDDS:	Urban dynamometer drive schedule
ULEV:	Ultra-low-emission vehicle
US06:	A high-speed, high-acceleration, test procedure designed to measure off-cycle emissions
U.S. DOE:	United States Department of Energy
U.S. EPA:	United States Environmental Protection Agency
VC-T:	Variable compression ratio turbocharged engine
VMT:	Vehicle miles traveled
ZEV:	Zero-emission vehicle
zVMT:	Zero-emission vehicle miles traveled

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THE ADMINISTRATOR OF THE ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D C 20460

JAN 1 2 2017

Dear Stakeholders:

I have determined that the model year (MY) 2022-2025 light-duty vehicle greenhouse gas (GHG) standards adopted in the 2012 final rule establishing the MY2017-2025 standards (77 FR 62624, October 15, 2012) are appropriate under section 202 (a)(1) of the Clean Air Act. This adjudicatory Final Determination concludes the Midterm Evaluation of standards required under 40 CFR 86.1818-12(h) of the Environmental Protection Agency (EPA) regulations.

This Final Determination follows the November 2016 release of the EPA's Proposed Determination and the July 2016 release of a Draft Technical Assessment Report (TAR), issued jointly by the EPA, the National Highway Traffic Safety Administration (NHTSA), and the California Air Resources Board (CARB). Opportunities for public comment were provided for both the Draft TAR and the Proposed Determination. In the Draft TAR, the agencies examined a wide range of issues relevant to GHG emissions standards for MY2022-2025, and shared with the public their initial technical analyses of those issues. The Draft TAR was required by the EPA's regulations as the first step in the Midterm Evaluation process. In developing the Proposed Determination, the EPA considered public comments on the Draft TAR and updated its analyses where appropriate in response to comments and to reflect the latest available data. The EPA has likewise considered public input on the Proposed Determination in developing this Final Determination.

As described in more detail in the enclosed rationale, I have determined that the standards adopted in 2012 by the EPA remain feasible, practical and appropriate under section 202(a) and do not need to be revised, after considering the factors laid out in the 2012 rule. I strongly believe that issuing this Final Determination at this time, in light of the robust technical record that supports it, is in the best interests of the auto industry, the One National Program to which the EPA, NHTSA and CARB committed in 2012, and public health and welfare. The success of the industry to date in achieving seven years of record sales while producing a 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 costs that are comparable or slightly lower than we predicted. I have considered carefully all the information submitted to the EPA from all stakeholders on the Proposed Determination, as well as on the Draft TAR, and I am confident that the standards as they currently exist can be met at a reasonable cost.

I note that in response to the EPA's solicitation of comment on the topic, several commenters spoke to the need for additional incentives or flexibilities in the out years of the program including incentives that could continue to help promote the market for very advanced technologies, such as electric vehicles. My determination, based on the record before me, is that the 2022-2025 standards currently in effect are feasible (evaluated against the criteria established in the 2012 rule) and appropriate under section 202, and do not need to be revised. This conclusion, however, neither precludes nor prejudices the possibility of a future rulemaking to provide additional incentives for very clean technologies or flexibilities that

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could assist manufacturers with longer term planning without compromising the effectiveness of the current program. The EPA is always open to further dialogue with the manufacturers, NHTSA, CARB and other stakeholders to explore and consider the suggestions made to date and any other ideas that could enhance firms' incentives to move forward with and to help promote the market for very advanced technologies, such as electric vehicles (EVs), plug-in hybrid electric vehicles (PHEVs), and fuel cell vehicles (FCEVs).

Materials related to the Final Determination and Midterm Evaluation are available in docket EPA-HQ-OAR-2015-0827 and at https://www.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-light-duty-vehicle-ghg-emissions.

We thank you for your interest in this issue.

Sincerely,

Gina McCarthy

Enclosure

Final Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation

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

U.S. Environmental Protection Agency

United States Environmental Protection Agency

EPA-420-R-17-001
January 2017

Table of Contents

Executive Summary 1
I. Introduction 9
A. Background on the Midterm Evaluation 9
B. Background on the Light-duty Vehicle GHG Standards 14
C. Climate Change Science 15
II. The Administrator's Assessment of Factors Relevant to the Appropriateness of the MY2022-2025 Standards 17
III. Final Determination 29

Executive Summary

The 2012 rulemaking establishing the National Program for federal greenhouse gas (GHG) emissions and corporate average fuel economy (CAFE) standards for model years (MY)2017-2025 light-duty vehicles included a regulatory requirement for the Environmental Protection Agency (EPA) to conduct a Midterm Evaluation (MTE) of the GHG standards established for model years (MY)2022-2025.[1] In this final order, the Administrator is making a final adjudicatory determination (hereafter "determination") that, based on her evaluation of extensive technical information available to her and significant input from the industry and other stakeholders, and in light of the factors listed in the 2012 final rule establishing the MY2017-2025 standards, the MY2022-2025 standards remain appropriate under section 202 (a) (1) of the Clean Air Act. This action leaves those standards entirely as they now exist, unaltered. The regulatory status quo is unchanged. This final order constitutes a final agency action. See 76 FR 48763 (Aug. 9, 2011).

This Final Determination follows the November 2016 Proposed Determination issued by the EPA Administrator and the July 2016 release of a Draft Technical Assessment Report (TAR), issued jointly by the EPA, the National Highway Traffic Safety Administration (NHTSA), and the California Air Resources Board (CARB). Opportunities for public comment were provided for both the Draft TAR and the Proposed Determination. In the Draft TAR, the agencies examined a wide range of issues relevant to GHG emissions standards for MY2022-2025, and shared with the public their initial technical analyses of those issues. The Draft TAR was required by EPA's regulations as the first step in the Midterm Evaluation process. In developing the Proposed Determination, the Administrator considered public comments on the Draft TAR and EPA updated its analyses where appropriate in response to comments and to reflect the latest available data. The Administrator has likewise considered public input on the Proposed Determination in developing this Final Determination.

As the final step in the MTE, the Administrator must determine whether the MY2022-2025 GHG standards, established in 2012, are still appropriate under section 202(a)(1) of the Clean Air Act (Act), in light of the record before the Administrator, given the latest available data and information. EPA's regulations establish April 1, 2018, as the latest date for such a determination, but otherwise do not constrain the Administrator's discretion to select an earlier determination date. The Administrator is choosing to make the Final Determination now, recognizing that long-term regulatory certainty and stability are important for the automotive industry and will contribute to the continued success of the program, which in turn will reduce emissions, improve fuel economy, deliver significant fuel savings to consumers, and benefit public health and welfare.

EPA received more than 100,000 public comments on the Proposed Determination, with comments from about 60 organizations and the rest from individuals. These public comments have informed the Administrator's Final Determination, and EPA has responded to those comments in the accompanying Response to Comments (RTC) document. This record[2]

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

[2] This record, the basis for the Administrator's determination, is contained in EPA Docket ID No. EPA-HQ-OAR-2015-0827.

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represents the most current information available, as informed by public comment, and provides the basis for the Administrator's Final Determination, as called for in the 2012 rule.

The EPA regulations state that in making the required determination, 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.[3]

This Final Determination is the Administrator's final decision on whether or not the MY2022-2025 standards are appropriate under section 202(a)(1) of the Clean Air Act, in light of the record now before the Administrator. EPA's regulations specify that the determination shall be "based upon a record that includes the following:

- A Draft Technical Assessment Report addressing issues relevant to the standard for the 2022 through 2025 model years;
- Public comment on the Draft Technical Assessment Report;
- Public comment on whether the standards established for the 2022 through 2025 model years are appropriate under section 202(a) of the Clean Air Act; and
- Such other materials the Administrator deems appropriate."[4]

The EPA has now concluded all the required steps in the MTE process and the record upon which the Administrator is making this Final Determination reflects all the elements specified in the regulations. As discussed above, EPA issued (jointly with NHTSA and CARB) the July 2016 Draft Technical Assessment Report (TAR) and sought public comment on it. EPA updated

[3] 40 CFR 86.1818-12(h)(1).
[4] 40 CFR 86.1818-12(h)(2).

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its Draft TAR assessment in response to public comments as part of the November 2016 Proposed Determination. EPA also sought public comment on the Proposed Determination that the GHG standards for MY2022-2025 remain appropriate under section 202 (a)(1) of the Act. If those comments had included information that led the Administrator to the determination that the standards are inappropriate, EPA would then have had to initiate a rulemaking seeking to amend those standards, as specified in the MTE regulation.[5] However, no factual evidence came to light in the public comments or otherwise that leads the Administrator to a different conclusion than the one set forth in the Proposed Determination. The Administrator is thus making this Final Determination that the standards remain appropriate, and that no further action under the Midterm Evaluation is necessary. Thus the standards remain unchanged and the regulatory status quo is unaltered. See also 76 FR 48763 (Aug. 9, 2011) ("[t]he MY2022-2025 GHG standards will remain in effect unless and until EPA changes them by rulemaking").

EPA's updated analyses presented in the Proposed Determination built upon and were directly responsive to public comments on the Draft TAR. The Administrator has fully considered public comments submitted in response to the Proposed Determination, and EPA has responded to comments in the accompanying Response to Comments (RTC) document. The Administrator believes that there has been no information presented in the public comments on the Proposed Determination that materially changes the Agency's analysis documented in the Proposed Determination. Therefore, the Administrator considers the analyses presented in the Proposed Determination[6] as the final EPA analyses upon which her Final Determination is based.

The Administrator notes that, in response to EPA's solicitation of comment on the topic, several commenters spoke to the need for additional incentives or flexibilities in the out years of the program including incentives that could continue to help promote the market for very advanced technologies, such as electric vehicles. She notes that her determination, based on the record before her, is that the MY2022-2025 standards currently in effect are feasible (evaluated against the criteria established in the 2012 rule) and appropriate under section 202, and do not need to be revised. This conclusion, however, neither precludes nor prejudices the possibility of a future rulemaking to provide additional incentives for very clean technologies or flexibilities that could assist manufacturers with longer term planning without compromising the effectiveness of the current program. The EPA is always open to further dialogue with the manufacturers, NHTSA, CARB and other stakeholders to explore and consider the suggestions made to date and any other ideas that could enhance firms' incentives to move forward with and to help promote the market for very advanced technologies, such as electric vehicles (EVs), plug-in hybrid electric vehicles (PHEVs), and fuel cell vehicles (FCEVs).

The basis for the Administrator's assessment supporting her decision that the MY2022-2025 standards are appropriate is summarized below.

The Standards Are Feasible at Reasonable Cost, Without Need for Extensive Electrification. As part of our technical assessment of the technologies available to meet the MY2022-2025 GHG standards, we present a range of feasible, cost-effective compliance pathways to meet the

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

[6] Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation, EPA-420-R-16-020, and accompanying Technical Support Document, EPA-420-R-16-021, November 2016.

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MY2022-2025 standards. This analysis demonstrates that compliance can be achieved through a number of different technology pathways reflecting predominantly the application of technologies already in commercial production. The EPA also considered further developments in technologies where there is reliable evidence that those technologies could be feasibly deployed by 2025. The standards are in fact devised so as not to force manufacturers into a single compliance path, and the analysis showing multiple compliance pathways indicates that the standards provide each manufacturer with the flexibility to apply technologies in the way it views best to meet the needs of its customers. Moreover, given the rapid pace of automotive industry innovation, we believe there are, and will continue to be, emerging technologies that will be available in the MY2022-2025 time frame that could perform appreciably better at potentially lower cost than the technologies modeled in EPA's assessment. We have already seen this type of innovative development since the MY2017-2025 GHG standards were originally promulgated in 2012, including expanded use of continuously variable transmissions and introduction of higher expansion ratio, naturally aspirated gasoline engines (Atkinson). Updated information also shows that some of the technologies we did anticipate in 2012 are costing less, and are more effective, than we anticipated at that time.

EPA further projects that the MY2022-2025 standards can be met largely through advances in gasoline vehicle technologies, such as improvements in engines, transmissions, light-weighting, aerodynamics, and accessories, and, as noted, that there are multiple available compliance pathways based on the predominant use of these technologies. This analysis is consistent with both agencies' findings in the 2012 final rulemaking (FRM). Table ES-1 shows fleet-wide penetration rates for a subset of the technologies EPA projects could be used to comply with the MY2025 standards. The analyses further indicate that very low levels of strong hybrids and electric vehicles (both plug-in hybrid electric vehicles (PHEV) and electric vehicles (EV)) will be needed to meet the standards. EPA analyzed a central case low-cost pathway as well as multiple sensitivity cases, all of which show that compliance can be achieved through a number of different technology pathways without extensive use of strong hybrid or electric vehicles. These sensitivity cases include various fuel price scenarios, cost markups, and technology penetrations (e.g., lower Atkinson penetration, lower mass reduction, alternative transmissions). See Table ES-1, presenting the sensitivity cases as a range of technology penetrations and per-vehicle costs. These costs are lower than those projected in the 2012 rule; at that time, the EPA projected that average per-vehicle costs, although reasonable, would be about $1,100.[7]

Table ES-1 Selected Technology Penetrations (Absolute) and Per-Vehicle Average Costs (2015$) to Meet MY2025 GHG Standards (Incremental to the Costs to Meet the MY2021 Standards)[1]

	Final Determination	
	Primary Analysis	Range of Sensitivities Analyzed
Turbocharged and downsized gasoline engines (%)	34%	31 - 41%
Higher expansion ratio, naturally aspirated gasoline engines (%)	27%	5 - 41%
8 speed and other advanced transmissions[2] (%)	93%	92 - 94%
Mass reduction (%)	9%	2 - 10%

[7] 77 FR 62853, October 15, 2012; Draft Technical Assessment Report, Table 12.44.

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Off-cycle technology[3]	26%	13 - 51%
Stop-start (%)	15%	12 - 39%
Mild Hybrid (%)	18%	16 - 27%
Strong Hybrid (%)	2%	2 - 3%
Plug-in hybrid electric vehicle[4] (%)	2%	2%
Electric vehicle[4] (%)	3%	2 - 4%
Per vehicle cost (2015$)	**$875**	**$800 - $1,115**

Notes:
[1] Percentages shown are absolute rather than incremental. Values based on AEO 2016 reference case.
[2] Including continuously variable transmissions (CVT).
[3] In addition to modeling the off-cycle credits of stop-start and active aerodynamics, EPA also assessed additional off-cycle technologies as unique technologies that can be applied to a vehicle and that reduce CO_2 emissions by either 1.5 g/mi or 3 g/mi. See Proposed Determination Appendix C.1.1.1.3,
[4] Electric vehicle penetrations include the California Zero Emission Vehicle (ZEV) program.

The Standards Will Achieve Significant CO_2 and Oil Reductions. Based on various assumptions, including the U.S. Department of Energy's Annual Energy Outlook (AEO) 2016 reference case projections of the car/truck mix out to 2025, the footprint-based GHG standards curves for MY2022-2025 are projected to achieve an industry-wide fleet average carbon dioxide (CO_2) target of 173 grams/mile (g/mi) in MY2025 (Table ES-2). The projected fleet average CO_2 target represents a 2-cycle GHG emissions compliance level equivalent to 51.4 mpg-e (if all reductions were achieved exclusively through fuel economy improvements).[8] EPA projects that this GHG compliance level of 51.4 mpg-e could be met by automakers with average real world/label fuel economy of about 36 mpg. Given that the MY2016 real world fleet average fuel economy is about 26 mpg, this means that the fleet must improve real world fuel economy by about 10 mpg over the 9-year period from 2016 to 2025, or about one mpg per year.[9]

As a sensitivity, Table ES-2 also includes target projections based on two AEO 2016 scenarios in addition to the AEO 2016 reference case: a low fuel price case and a high fuel price case. Under the footprint-based standards, the program is designed to ensure significant GHG reductions across the fleet, and each automaker's standard automatically adjusts based on the mix (size and volume) of vehicles it produces each model year. Thus, as shown in Table ES-2, different fuel price cases translate into different projections for the car/truck fleet mix (e.g., with a higher truck share shown in the low fuel price case, and a lower truck share shown in the high fuel price case), which in turn leads to varying projections for the CO_2 targets and MPG-e levels projected for MY2025. These estimated CO_2 target levels reflect changes in the latest projections about the MY2025 fleet mix compared to the projections in 2012 when the standards were first established.

In our analysis for this Final Determination, we are applying the same footprint-based curves to the updated fleet projections for MY2025. It is important to keep in mind that the updated

[8] The projected MY2025 target of 173 g/mi represents an approximate 50 percent decrease in GHG emissions relative to the fuel economy standards that were in place in 2010. It is clear from current GHG manufacturer performance data that many automakers are earning air conditioner refrigerant GHG credits that reduce GHG emissions, but do not improve fuel economy. Accordingly, the projected MY2025 target of 173 g/mi represents slightly less than a doubling of fuel economy relative to the standards that were in place in 2010.
[9] U.S. EPA, Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 Through 2016," November 2016, www.epa.gov/fuel-economy/trends-report.

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MY2025 fleet wide projections reflected in this Final Determination are still projections-- based on the latest available information, which will likely continue to change with future projections -- and that the actual GHG emissions/fuel economy level achieved in MY2025 will not be determined until the manufacturers have completed their MY2025 production. Put another way, each manufacturer will not know what its individual standard is until MY2025, since that individual standard is determined by the type and number of vehicles the manufacturer chooses to produce.

Table ES-2 Projections for MY2025: Car/Truck Mix, CO_2 Target Levels, and MPG-equivalent[1]

	2012 Final Rule	Final Determination		
	AEO 2011 Reference	**AEO 2016 Reference**	AEO 2016 Low	AEO 2016 High
Fuel Price in 2025 ($/gallon)[2]	$3.87	**$2.97**	$1.97	$4.94
Car/truck mix	67/33%	**53/47%**	44/56%	63/37%
CO_2 (g/mi)	163	**173**	178	167
MPG-e[3]	54.5	**51.4**	49.9	53.3

Notes:
[1] The CO_2 and MPG-e values shown here are 2-cycle compliance values. Projected real-world values are detailed in the Proposed Determination TSD Chapter 3; for example, AEO reference fuel price case, real-world CO_2 emissions performance would be 233 g/mi and real-world fuel economy would be about 36 mpg.
[2] AEO 2011 fuel price is 2010$ (equivalent to $4.21 in 2015$); AEO 2016 fuel prices are 2015$.
[3] Mile per gallon equivalent (MPG-e) is the corresponding fleet average fuel economy value if the entire fleet were to meet the CO_2 standard compliance level through tailpipe CO_2 improvements that also improve fuel economy. This is provided for illustrative purposes only, as we do not expect the GHG standards to be met only with fuel efficiency technology.

EPA estimates that over the vehicle lifetimes the MY2022-2025 standards will reduce GHG emissions by 540 million metric tons and reduce oil consumption by 1.2 billion barrels, as shown in Table ES-3.

Table ES-3 Cumulative GHG and Oil Reductions for Meeting the MY2022-2025 Standards (Vehicle Lifetime Reductions)

	Final Determination[1]
GHG reduction (million metric tons, MMT CO_2e)	540
Oil reduction (billion barrels)	1.2

Note:
[1] Values based on AEO 2016 reference case.

The Standards Will Provide Significant Benefits to Consumers and to the Public. The net benefits of the MY2022-2025 standards are nearly $100 billion (at 3 percent discount rate). Table ES-4 presents the societal monetized benefits associated with meeting the MY2022-2025 standards. The EPA also evaluated the benefit-costs of additional scenarios (AEO 2016 high and low fuel price scenarios). See Proposed Determination Section IV.A. In all cases, the net benefits far exceed the costs of the program. It is also notable that in all cases, the benefits (excluding fuel savings) and the fuel savings, each independently, exceed the costs. That is, the

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benefits exceed the costs without considering any fuel savings, and likewise fuel savings exceed the costs even without considering any other benefits.

Table ES-4 GHG Analysis of Lifetime Costs & Benefits to Meet the MY2022-2025 GHG Standards (for Vehicles Produced in MY2021-2025)[1] (Billions of $)

	Final Determination[2]	
	3 Percent Discount Rate	7 Percent Discount Rate
Vehicle Program	-$33	-$24
Maintenance	-$3	-$2
Fuel	$92	$52
Benefits[1]	$42	$32
Net Benefits	$98	$59

Notes:
[1]All values are discounted back to 2016. See the Proposed Determination Appendix C for details on discounting social cost of GHG and non-GHG benefits, and for a discussion that the costs and benefits reflect some early compliance with the MY2025 standard in MY2021.
[2] Values based on AEO 2016 reference case and 2015$.

When considering the payback of an average MY2025 vehicle compared to a vehicle meeting the MY2021 standards, we believe one of the most meaningful analyses is to look at the payback for consumers who finance their vehicle, as the vast majority of consumers (nearly 86 percent) purchase new vehicles through financing. The average loan period is over 67 months. Consumers who finance their vehicle with a 5-year loan would see payback within the first year. Consumers who pay cash for their vehicle would see payback in the fifth year of ownership. Consumers would realize net savings of $1,650 over the lifetime of their new vehicle (i.e., net of increased lifetime costs and lifetime fuel savings). Even with the lowest fuel prices projected by AEO 2016 (see Proposed Determination Appendix C), approximately $2 per gallon in 2025, the lifetime fuel savings significantly outweigh the increased lifetime costs.

Table ES-5 Payback Period and Net Lifetime Consumer Savings for an Average MY2025 Vehicle Compared to the MY2021 GHG Standards

	Final Determination[1]
Payback period – 5-year loan purchase[2] (years)	<1
Payback period – Cash purchase (years)	5
Net Lifetime Consumer Savings ($, discounted at 3%)	$1,650

Notes:
[1] Values based on AEO 2016 reference case and 2015$
[2] Using an interest rate of 4.25 percent.

The Auto Industry is Thriving and Meeting the Standards More Quickly than Required. While the Final Determination focuses on the MY2022-2025 standards, we note that the auto industry, on average, has out-performed the first four years of the light-duty GHG standards (MY2012-2015). This has occurred concurrently with a period during which the industry successfully rebounded after a period of economic distress. The recently released GHG Manufacturer

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Performance Report for the 2015 Model Year shows that the National Program is working even at low fuel prices and automakers are over-complying with the standards, notwithstanding that the MY2015 standard was the most stringent to date, and that the increase in stringency from the previous model year was also the most pronounced to date.[10] Further, concurrently with out-performing the GHG standards, sales have increased for seven straight years, for the first time in 100 years, to an all-time record high in 2016, reflecting positive consumer response to vehicles meeting the standards.

The Administrator's Final Determination is that the MY2022-2025 standards remain appropriate. In light of the pace of progress in reducing GHG emissions since the MY2022-2025 standards were adopted, the success of automakers in achieving the standards to date while vehicle sales are strong, the projected costs of the standards, the impact of the standards on reducing emissions and fuel costs for consumers, and the other factors identified in 40 CFR 86.1818-12(h), the Administrator concludes that the record does not support a conclusion that the MY2022-2025 standards should be revised to make them less stringent. The Administrator did consider whether it would be appropriate to propose to amend the standards to increase their stringency. In her view, 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. However, she also recognizes that regulatory certainty and consequent stability is important, and that it is important not to disrupt the industry's long-term planning. Long lead time is needed to accommodate significant redesigns. The Administrator also believes a decision to maintain the current standards provides support to a timely NHTSA rulemaking to adopt MY2022-2025 standards, as well as to the California Air Resources Board to consider in its review of the California GHG vehicle standards for MY2022-2025 as part of its Advanced Clean Cars program,[11] and thus to a harmonized national program. The Administrator consequently has concluded that it is appropriate to provide the full measure of lead time for the MY2022-2025 standards, rather than adopting (or, more precisely, proposing to adopt) new, more stringent standards with a shorter lead time.

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[10] "Greenhouse Gas Emission Standards for Light-duty Vehicles, Manufacturer Performance Report for the 2015 Model Year, November 2016, EPA-420-R-16-014.https://www.epa.gov/regulations-emissions-vehicles-and-engines/ghg-emission-standards-light-duty-vehicles-manufacturer.

[11] California adopted its own GHG standards for MY2017-2025 in 2012 prior to EPA and NHTSA finalizing the National Program. Through direction from its Board in 2012, CARB both adopted a "deemed to comply" provision allowing compliance with EPA's GHG standards in lieu of CARB's standards, and committed to participate in the Midterm Evaluation (https://www.arb.ca.gov/msprog/consumer_info/advanced_clean_cars/consumer_acc_mtr.htm).

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I. Introduction

A. Background on the Midterm Evaluation

The Environmental Protection Agency (EPA) and the National Highway Traffic Safety Administration (NHTSA) have conducted two joint rulemakings to establish a coordinated National Program for federal greenhouse gas (GHG) emissions and corporate average fuel economy (CAFE) standards for light-duty vehicles. Light-duty vehicles, which include passenger cars, sport utility vehicles, crossover utility vehicles, minivans, and pickup trucks, make up about 60 percent of all U.S. transportation-related GHG emissions and fuel consumption.[12] The agencies finalized the first set of National Program standards covering model years (MYs) 2012-2016 in May 2010[13] and the second set of standards, covering MY2017-2025, in October 2012.[14] The National Program is one of the most significant federal actions ever taken to reduce domestic GHG emissions and improve automotive fuel economy, establishing standards that increase in stringency year-over-year from MY2012 through MY2025 and projected to reach a level that nearly doubles fuel economy and halves GHG emissions compared to MY2010.

Through the coordination of the National Program with the California Air Resources Board's GHG standards, automakers can build one single fleet of vehicles across the U.S. that satisfies all GHG/CAFE requirements, and consumers can continue to have a full range of vehicle choices that meet their needs.[15] In addition, the Canadian government has adopted standards aligned with the U.S. EPA GHG standards through MY2025, further facilitating manufacturers' ability to produce vehicles satisfying harmonized standards.[16] Most stakeholders strongly supported the National Program, including the auto industry, automotive suppliers, state and local governments, labor unions, NGOs, consumer groups, veterans groups, and others. In the agencies' 2012 final rules, the National Program was estimated to reduce carbon dioxide (CO_2) emissions by 6 billion metric tons and reduce oil consumption by 12 billion barrels over the lifetime of MY2012-2025 vehicles. The standards are projected to provide significant savings for consumers due to reduced fuel use and consequent reduced fuel expenditures.

The 2012 final rule established standards through MY2025 to provide substantial lead time and regulatory certainty to the industry. Recognizing the rule's long time frame, EPA's rule establishing GHG standards for MY2017-2025 light-duty vehicles included a requirement for the agency to conduct a Midterm Evaluation (MTE) of the MYs 2022-2025 GHG standards. Through the MTE, EPA must determine whether the GHG standards for MY2022-2025,

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[12] Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2014, EPA Publication number EPA 430-R-16-002, April 15, 2016. Overall transportation sources account for 26 percent of total U.S. GHG emissions.

[13] 75 FR 25324, May 7, 2010.

[14] 77 FR 62624, October 15, 2012.

[15] Subsequent to the adoption of California-specific GHG standards for MYs 2017-2025 and the adoption of the Federal standards for MY2017 and beyond, CARB adopted a "deemed to comply" provision in furtherance of a National Program whereby compliance with the federal GHG standards would be deemed to be compliance with California's GHG program.

[16] EPA has coordinated with Environment and Climate Change Canada (ECCC) and Transport Canada throughout the Midterm Evaluation, including collaborating on a number of technology research projects. See Draft Technical Assessment Report Chapter 2.2.3, p. 2-8.

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established in 2012, are still appropriate, within the meaning of section 202(a)(1) of the Clean Air Act, in light of the record before the Administrator, given the latest available data and information. See 40 CFR 86.1818-12(h). The MTE regulations provide that if the Administrator were to make a determination that the standards are not appropriate, based upon consideration of the decision factors in the regulation and the factual record available to the Administrator at the time of the determination, then the EPA would initiate a rulemaking to amend the standards to make them either more or less stringent. See 40 CFR 86.1818-12(h) (final sentence). This regulatory provision to conduct a rulemaking is limited only to the situation where the Administrator makes a determination that the standards are not appropriate and should be changed, to be either more or less stringent, and not to the situation where the Administrator, as in the case of this Final Determination, determines that the standards are appropriate and should not be changed. See 77 FR 62784 (Oct. 15, 2012) (stating that if EPA concludes the standards are appropriate it will "announce that final decision and the basis for EPA's decision" and if the EPA decides the standards are not appropriate, it will "initiate a rulemaking to adopt standards that are appropriate under section 202(a)").

In the 2012 rulemaking, the EPA stated its intention that the MTE would entail "a holistic assessment of all of the factors considered in standards setting," and "the expected impact of those factors on manufacturers' ability to comply, without placing decisive weight on any particular factor or projection." See 77 FR 62784 (Oct. 15, 2012). Indeed, the analyses supporting this MTE have been as robust and comprehensive as that in the original setting of the MY2017-2025 standards, *Id.*, although the nature of the decision-making the EPA has undertaken based on those analyses is very different, as established by design of the MTE regulations. In the 2012 rule, the EPA was faced with establishing the MY2017-2025 standards, while in this Final Determination the EPA has evaluated those standards in light of developments to date in order to determine if the existing standards are appropriate. *Id.* In gathering data and information throughout the MTE process, the EPA has drawn from a wide range of sources, including vehicle certification data, research projects and vehicle testing programs initiated by the agencies, input from stakeholders, and information from technical conferences, published literature, studies published by various organizations, and the many public comments.

In July 2016, EPA, NHTSA, and CARB jointly issued for public comment a Draft Technical Assessment Report (TAR) examining a wide range of issues relevant to the MY2022-2025 standards.[17] For the EPA, the Draft TAR was the first formal step in the MTE process as required under EPA's regulations.[18] The Draft TAR was a technical report, not a decision document. It was an opportunity for all three agencies to share with the public their technical analyses relating to the appropriateness of the MY2022-2025 standards.

The EPA received over 200,000 public comments on the Draft TAR, including about 90 comments from organizations and the rest from individuals. The organization commenters included auto manufacturers and suppliers, environmental and other non-governmental organizations (NGOs), consumer groups, state and local governments and their associations, labor unions, fuels and energy providers, auto dealers, academics, national security experts,

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[17] 81 FR 49217, July 27, 2016.
[18] See 40 CFR 86.1818-12(h)(2)(i).

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veteran's groups, and others. These comments presented a range of views on whether the standards should be retained, or made more or less stringent, and, in some cases, provided additional factual information that EPA considered in updating its analyses in support of the Administrator's Proposed Determination. The EPA also considered the few additional comments received after the close of the comment period on the Draft TAR.[19]

On November 30, 2016, EPA Administrator issued a proposed adjudicatory determination[20] proposing to find that the MY2022-2025 standards remain appropriate under the Clean Air Act. Because the Administrator was proposing that there be no change to the MY2022-2025 standards currently in the regulations, in other words that there be no change in the standards' stringency, the Proposed Determination did not include a Notice of Proposed Rulemaking. See section 86.1818-12(h). In this Final Determination, the Administrator has once again considered public comments -- those received on the Proposed Determination. The EPA received more than 100,000 comments on the Proposed Determination, with about 60 comments from organizations and the rest from individuals. The EPA responds to the public comments in the accompanying Response to Comments (RTC) document.

The EPA regulations state that in making the required determination, 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;

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[19] After the close of the comment period on the Draft TAR, EPA received and docketed additional comments from Volkswagen, the Electric Drive Transportation Association, and the Alliance of Automobile Manufacturers (a non-technical comment), all of which the EPA considered in the Proposed Determination.

[20] As noted in the Proposed Determination, and discussed more fully in the Response to Comments, the determination is not a rulemaking. None of EPA's rules, the Administrative Procedures Act, or the Clean Air Act require that the determination be made by rulemaking. EPA is properly exercising its discretion to proceed by adjudication. The final determination evaluates the technical record and concludes that the current standards are appropriate. As with past mid-course evaluations of Title II rules, where the EPA evaluates standards and decides not to change them, it need not undertake, and is not undertaking, a rulemaking. For example, in the final rule for heavy-duty engine standards (66 FR 5063, January 18, 2001), EPA announced regular biennial reviews of the status of the key emission control technology. EPA subsequently issued those reviews in 2002 and 2004, without going through rulemaking. See EPA Report 420-R-02-016; EPA Report 420-R-04-004. Or for instance, in the final rule for the Nonroad Tier 3 standards (63 FR 56983, Oct 23, 1998), EPA committed to reviewing the feasibility of the standards by 2001 and to adjust them by rulemaking if necessary. In 2001, without engaging in rulemaking, the EPA published a report, see EPA Report 420-R-01-052, accepted comments, and concluded publicly that the standards remained technologically feasible. (Memorandum: "Comments On Nonroad Diesel Emissions Standards: Staff Technical Paper," from Chet France to Margo Oge, June 4, 2002).

ED_001276_00004660-00088

- 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.[21]

The preamble to the 2012 final rule further listed ten relevant factors that the agencies will consider at a minimum during the MTE. The EPA in fact addressed all of these issues in the Draft TAR, and considered them further in the Proposed Determination and in this Final Determination.[22]

- Development of powertrain improvements to gasoline and diesel powered vehicles;
- Impacts on employment, including the auto sector;
- Availability and implementation of methods to reduce weight, including any impacts on safety;
- Actual and projected availability of public and private charging infrastructure for electric vehicles, and fueling infrastructure for alternative fueled vehicles;
- Costs, availability, and consumer acceptance of technologies to ensure compliance with the standards, such as vehicle batteries and power electronics, mass reduction, and anticipated trends in these costs;
- Payback periods for any incremental vehicle costs associated with meeting the standards;
- Costs for gasoline, diesel fuel, and alternative fuels;
- Total light-duty vehicle sales and projected fleet mix;
- Market penetration across the fleet of fuel efficient technologies;
- Any other factors that may be deemed relevant to the review.[23]

In the 2012 final rule, the agencies projected that the MY2025 standards would be met largely through advances in conventional vehicle technologies, including advances in gasoline engines (such as downsized/turbocharged engines) and transmissions, vehicle weight reduction, improvements in aerodynamics, more efficient accessories, and lower rolling resistance tires. The agencies also projected that vehicle air conditioning systems would continue to improve by becoming more efficient and by increasing the use of alternative refrigerants and lower leakage systems. The EPA estimated that some increased electrification of the fleet would occur through the expanded use of stop/start and mild hybrid technologies, but projected that the MY2025 standards could be met with only about five percent of the fleet being strong hybrid electric vehicles (HEVs) and only about two percent of the fleet to be electric vehicles (EV) or plug-in hybrid electric vehicles (PHEVs).[24] All of these technologies were available at the time of the

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[21] 40 CFR 86.1818-12(h).

[22] 76 FR 48673 (Aug. 9, 2011) and 77 FR 62784, October 15, 2012.

[23] Among the other factors deemed relevant and addressed in the Draft TAR and Proposed Determination, EPA's analysis examined the potential impact of the California Zero Emission Vehicle (ZEV) program, which California has revised since the 2012 final rule. EPA also examined the availability and use of credits, including credits for emission reductions from air conditioning improvements and from off-cycle technologies.

[24] For comparison to vehicles for sale today, an example of a mild HEV is GM's eAssist (Buick Lacrosse), a strong HEV is the Toyota Prius, an EV is the Nissan Leaf, and a PHEV is the Chevrolet Volt.

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2012 final rule, some on a limited number of vehicles while others were more widespread, and the agencies projected that manufacturers would be able to meet the standards through significant efficiency improvements in the technologies, as well as through increased usage of these and other technologies across the fleet.

Since the 2012 final rule, vehicle sales have been strong, hitting an all-time high of 17.5 million vehicles in 2015, gas prices have dropped significantly, and truck share of the fleet has increased. At the same time, auto manufacturers have over-complied with the GHG program for each of the first four years of the program (MY2012-2015), and the industry as a whole has built a substantial bank of credits from the initial years of the program.[25] Technologies that reduce GHG emissions are entering the market at rapid rates, including more efficient engines and transmissions, aerodynamics, light-weighting, improved accessories, low rolling resistance tires, improved air conditioning systems, and others. Manufacturers are also using certain technologies that the agencies did not consider in their evaluation in the 2012 rule, including non-hybrid Atkinson cycle gasoline engines and 48-volt mild hybrid systems. Other technologies are being utilized at greater rates than the agencies projected, such as continuously variable transmissions (CVTs). These additional technologies have resulted in projected compliance pathways which differ slightly from those in the 2012 final rule with respect to some of the specific technologies expected to be applied to meet the future standards. However, the conclusions of the 2012 Final Rule, the July 2016 Draft TAR, the November 2016 Proposed Determination, and this Final Determination are very similar: that advanced gasoline vehicles will be the predominant technologies that manufacturers can use to meet the MY2025 standards. This assessment is similar to the conclusion of a 2015 study by the National Academy of Sciences which also found that the 2025 standards could be achieved primarily with advanced gasoline vehicle technologies.[26] As discussed below, the standards are also projected to be achievable through multiple feasible technology pathways at reasonable cost -- less than projected in the 2012 rulemaking -- and with significant direct benefit to consumers in the form of net savings due to purchasing less fuel.

The Administrator notes that, in response to EPA's solicitation of comment on the topic, several commenters spoke to the need for additional incentives or flexibilities in the out years of the program including incentives that could continue to help promote the market for very advanced technologies, such as electric vehicles. She notes that her determination, based on the record before her, is that the MY2022-2025 standards currently in effect are feasible (evaluated against the criteria established in the 2012 rule) and appropriate under section 202, and do not need to be revised. This conclusion, however, neither precludes nor prejudices the possibility of a future rulemaking to provide additional incentives for very clean technologies or flexibilities that could assist manufacturers with longer term planning without compromising the effectiveness of the current program. The EPA is always open to further dialog with the manufacturers, NHTSA, CARB and other stakeholders to explore and consider the suggestions made to date and any other ideas that could enhance firms' incentives to move forward with and

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[25] "Greenhouse Gas Emission Standards for Light-duty Vehicles, Manufacturer Performance Report for the 2015 Model Year, November 2016, EPA-420-R-16-014.

[26] "Cost, Effectiveness and Deployment of Fuel Economy Technologies for Light-Duty Vehicles," National Research Council of the National Academies, June 2015, Finding 2.1 (p. 2-83).

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to help promote the market for very advanced technologies, such as electric vehicles (EVs), plug-in hybrid electric vehicles (PHEVs), and fuel cell vehicles (FCEVs).

B. Background on the Light-duty Vehicle GHG Standards

The GHG emissions standards are attribute-based standards, based on vehicle footprint.[27] In other words, the standards are based on a vehicle's size: larger vehicles have numerically higher GHG emissions targets and smaller vehicles have numerically lower GHG emissions targets. Manufacturers are not compelled to build vehicles of any particular size or type, and each manufacturer has a unique fleetwide standard for each of its car and truck fleets that reflects the light-duty vehicles it chooses to produce in a given model year. Each automaker's standard automatically adjusts each year based on the vehicles (sizes and volumes) it produces. With fleetwide averaging, a manufacturer can produce some models that exceed their target, and some that are below their target. This approach also helps preserve consumer choice, as the standards do not constrain consumers' opportunity to purchase the size of vehicle with the performance, utility and safety features that meet their needs. In addition, manufacturers have available many other flexibility provisions, including banking and trading of credits across model years and trading credits across manufacturers.

The footprint curves for the MY2012-2025 GHG standards, illustrating the year-over-year stringency increases, are shown below in Figure I.1 and Figure I.2.[28]

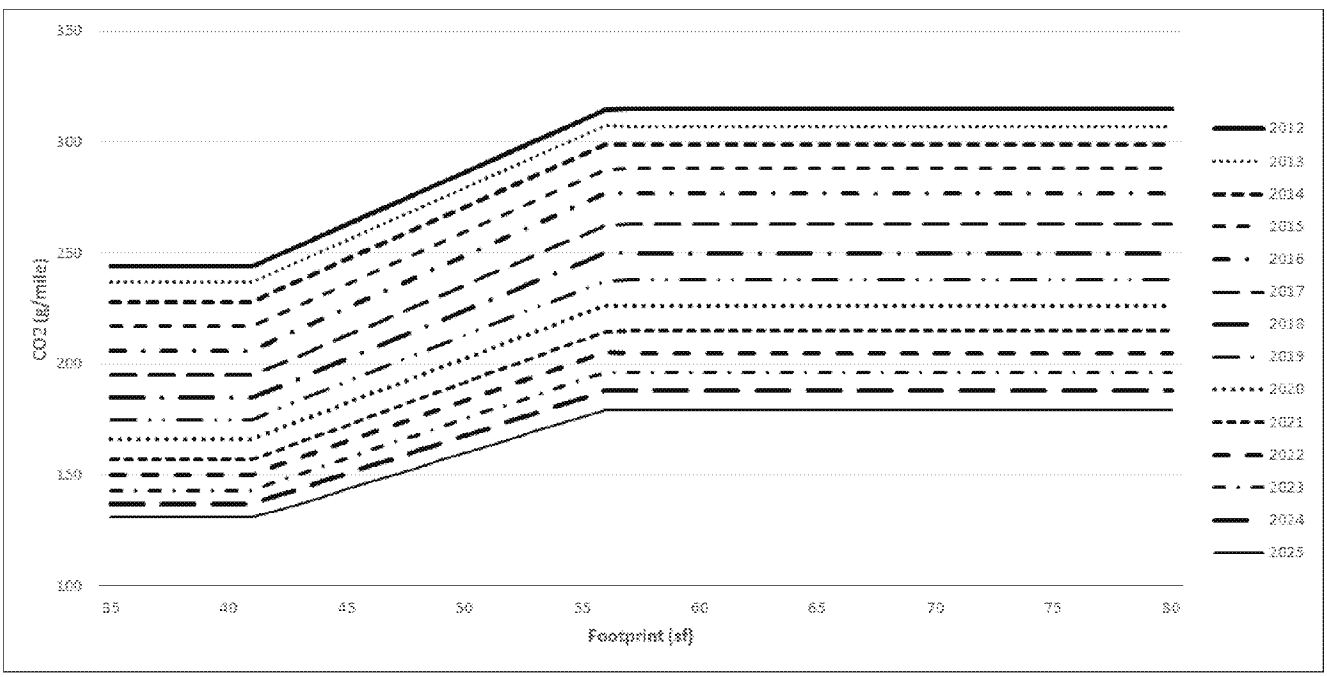

Figure I.1 CO_2 (g/mile) Passenger Car Standards Curves

[27] Footprint is defined as a vehicle's wheelbase multiplied by its average track width—in other words, the area enclosed by the points at which the wheels meet the ground.

[28] See 40 CFR 86.1818-12(c).

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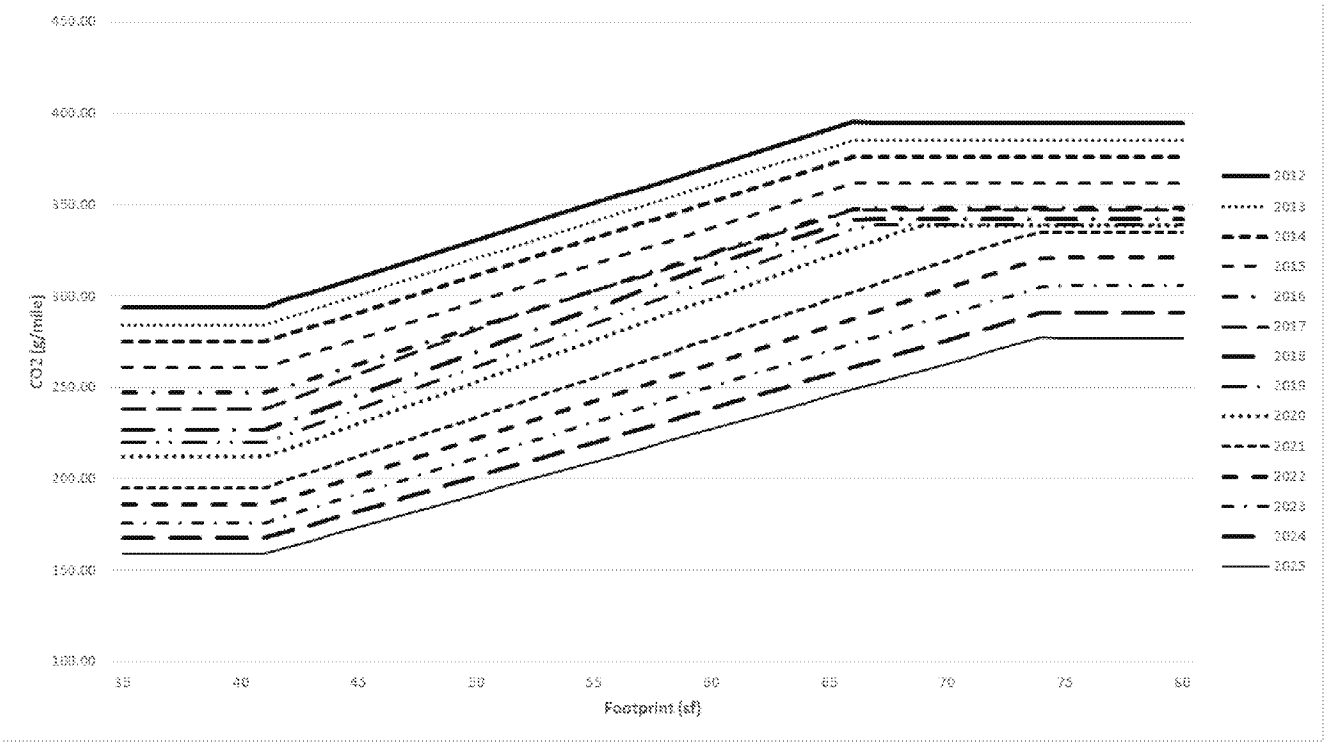

Figure I.2 CO_2 (g/mile) Light Truck Standards Curves

C. Climate Change Science

In the Proposed Determination, the EPA presented an overview of climate change science as laid out in the climate change assessments from the National Academies, the U.S. Global Change Research Program, and the Intergovernmental Panel on Climate Change. The EPA summarized the impacts to human health, to ecosystems, and to physical systems in the United States and around the world, from heat waves to sea level rise to disruptions of food security. Impacts to vulnerable populations such as children, older Americans, persons with disabilities, those with low incomes, indigenous peoples, and persons with preexisting or chronic conditions were also highlighted. The most recent assessments have confirmed and further expanded the science that supported the 2009 Endangerment and Cause or Contribute Findings for Greenhouse Gases Under section 202(a) of the Clean Air Act; Final Rule (74 FR 66496, December 15, 2009), as discussed in the more recent 2016 Finding That Greenhouse Gas Emissions from Aircraft Cause or Contribute to Air Pollution That May Reasonably Be Anticipated to Endanger Public Health and Welfare (81 FR 54422, August 15, 2016). Furthermore, the climate system continues to change: in 2015, CO_2 concentrations grew by more than 2 parts per million, reaching an annual average of 401 ppm, sea level continued to rise at 3.3 mm/year since the satellite record started in 1993, Arctic sea ice continues to decline, and glaciers continue to melt.[29] 2016 was the

[29] Blunden, J. and D. S. Arndt, Eds., 2016: State of the Climate in 2015. Bull. Amer. Meteor. Soc., 97 (8), S1–S275, DOI:10.1175/2016BAMSStateoftheClimate.

warmest year in the global average surface temperature record going back to 1880, the third year in a row of record temperatures.

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II. The Administrator's Assessment of Factors Relevant to the Appropriateness of the MY2022-2025 Standards

Through the Midterm Evaluation, the Administrator must determine whether the GHG standards for model years 2022-2025, established in 2012, are still appropriate, within the meaning of section 202(a)(1) of the Clean Air Act, given the latest available data and information in the record before the Administrator.[30] In this final order, the Administrator is making a final determination that the GHG standards currently in place for MYs 2022-2025 remain appropriate under the Clean Air Act. The consequence of this determination is that the standards remain unchanged, there is no alteration in the rules, and the regulatory status quo continues. The Administrator has fully considered public comments submitted on the Proposed Determination, and the EPA has responded to comments in the accompanying Response to Comments (RTC) document. The Administrator believes that there has been no information presented in the public comments on the Proposed Determination that materially changes the Agency's analysis documented in the Proposed Determination.[31] Therefore, the Administrator considers the analyses presented in the Proposed Determination as the final the EPA analyses upon which this Final Determination is based.

The EPA regulations[32] state that in making the required determination, 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:

(i) The availability and effectiveness of technology, and the appropriate lead time for introduction of technology;
(ii) The cost on the producers or purchasers of new motor vehicles or new motor vehicle engines;
(iii) The feasibility and practicability of the standards;
(iv) The impact of the standards on reduction of emissions, oil conservation, energy security, and fuel savings by consumers;
(v) The impact of the standards on the automobile industry;
(vi) The impacts of the standards on automobile safety;
(vii) The impact of the greenhouse gas emission standards on the Corporate Average Fuel Economy standards and a national harmonized program; and
(viii) The impact of the standards on other relevant factors.[33]

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[30] See 40 CFR 86.1818-12(h).

[31] Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation, EPA-420-R-16-020, and accompanying Technical Support Document, EPA-420-R-16-021, November 2016. In adopting the midterm evaluation provisions, EPA indicated that it "expect[ed] to place primary reliance on peer-reviewed studies" and on "NAS reports" in making midterm evaluation determinations. 77 FR 62787. EPA has in fact done so. See Draft TAR Section 2.2.1 and 2.2.3.

[32] See 40 CFR 86.1818-12(h)(1)(i) through (viii).

[33] 40 CFR 86.1818-12(h)(1).

ED_001276_00004660-00094

Below we discuss each of these factors in light of the analyses upon which this Final Determination is based.

(i) The availability and effectiveness of technology, and the appropriate lead time for introduction of technology; (ii) the cost on the producers or purchasers of new motor vehicles or new motor vehicle engines; (iii) the feasibility and practicability of the standards

Several of the factors relate to the technology assessment -- technology availability and effectiveness, lead time for introducing technologies, and the costs, feasibility and practicability of the standards. On the basis of EPA's extensive technical analyses contained in the Proposed Determination, and after consideration of the additional comments received by the agency, the Administrator finds that there will be multiple technologies available at reasonable cost to allow the industry to meet the MY2022-2025 standards, with the majority in commercial production today, and others under active development with reliable evidence of feasibility and availability in the market by 2025. See Proposed Determination Sections II and IV.A, and TSD Chapter 2. As in the 2012 FRM, The Administrator further finds that the MY2025 standards can be achieved with very low levels of strong hybrid or plug-in electrified vehicles. The EPA's extensive review of the literature, including but not limited to the 2015 NAS study, makes it clear that advanced gasoline vehicle technologies will continue to improve between now and 2025. In addition, the significant technology advances that have already occurred in just the four years since the 2012 final rule are a strong indication that technology will continue to advance, with clear potential for additional innovation over the next eight years.

The EPA projects a range of potential compliance pathways for each manufacturer and the industry as a whole to meet the MY2022-2025 standards (see Proposed Determination Table IV.5 and Appendix C which show a "central case" and eight sensitivity cases). This analysis indicates that the standards can be met largely through utilization of a suite of advanced gasoline vehicle technologies, with modest penetration of stop-start and mild hybrids and relatively low penetrations of strong hybrids, PHEVs and EVs. The 2015 National Academy of Sciences study on fuel economy technologies similarly found that the 2025 standards would be achieved largely through improvements to a range of technologies that can be applied to a gasoline vehicle without the use of strong hybrids, PHEV, or EV technology. It is important to underscore that EPA's projected technology penetrations are meant to illustrate one of many possible technology pathways to achieve compliance with the MY2022-2025 GHG standards. The rules do not mandate the use of any particular form of technology; the standards are performance-based and thus manufacturers are free to select among the suite of technologies they best believe is right for their vehicles to achieve compliance. As we have seen in recent years with the rapid advances in a wide range of GHG-reduction technologies, we expect that ongoing innovation will result in further improvements to existing technologies and the emergence of others.

As we note throughout this document, the EPA carefully considered and responded in detail to all of the significant public comments as part of the record for the Proposed Determination. Some industry commenters have expressed the view that the EPA did not in fact consider their technical comments. As described in the Proposed Determination and Chapter 2 of the TSD, a number of changes the EPA made to its analysis between the Draft TAR and the Proposed Determination were in response to those technical comments highlighted by the Alliance of Automobile Manufacturers and Global Automakers. These included updating the baseline fleet to a MY2015 basis, better accounting for certain technologies in that baseline fleet, improving

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the vehicle classification structure to improve the resolution of cost-effectiveness estimates applied in the OMEGA model, updating effectiveness estimates for certain advanced transmission technologies, conducting additional sensitivity analyses (including those where certain advanced technologies are artificially constrained), and adding quality assurance checks of technology effectiveness into the ALPHA and Lumped Parameter Model. See Proposed Determination Appendix A at A-1 and A-2. EPA consulted with NHTSA and CARB as part of the process of developing the Proposed Determination. The Final Determination is based on an administrative record at the very least as robust as that for the 2012 FRM, including extensive state-of-the-art research projects conducted by EPA and consultants to both agencies, data and input from stakeholders, multiple rounds of public comment, information from technical conferences, published literature, and studies published by various organizations. EPA put primary emphasis on the many peer-reviewed studies, as well as on the National Academy of Sciences 2015 report on fuel economy technologies.

Auto industry commenters believe that EPA's analysis generally overestimates the effect of advanced gasoline technologies, that these technologies will not be sufficient to meet the standards, and that higher levels of electrified vehicles will be needed to meet the MY2022-2025 standards. The EPA has carefully considered these comments and our assessment is that the commenters are not considering the possibility of applying the full range of road load reduction and non-electrified powertrain technologies broadly across high volume models, and in the combinations, that the EPA assessed in the Proposed Determination and Draft TAR. In some cases, the auto industry comments, including the Alliance of Automobile Manufacturers (Alliance), are based on the premise that the only possible technologies available in MY2025 will be represented by technology already contained in the fleet today (more specifically, that contained in the Draft TAR's MY2014 baseline fleet), and that those technologies will not improve in efficiency. The EPA disagrees with this assertion; several recently released engines have already demonstrated efficiencies that exceed those in the MY2014 fleet.[34] These actual engines illustrate that improvement has continued beyond the assumed basis of the comments, and it is highly unlikely that even these recent developments represent the limit of achievable efficiencies in the future. EPA's assessment is consistent with the MY2015 NAS report, in which the committee wrote that in the context of increasingly stringent fuel economy and GHG emissions standards, "gasoline-fueled spark ignition (SI) engine will continue to be the dominant powertrain configuration even through 2030 (pg S-1)."[35] 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 commenters do not even allow for the recombination of existing technologies, and thus severely and unduly limit potential effectiveness increases obtainable by MY2025. The EPA notes that events have already disproven this assumption; as one specific example, Ford introduced a 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 comments. NGO commenters, on

[34] These engines include the 1.5L Honda turbo, Volkswagen's EA888-3B Miller cycle, and Hyundai-Kia's 2.0L Atkinson cycle engine.

[35] The 2015 NAS report also included an example technology pathway which illustrated how the application of conventional, non-electrified technologies would enable the example midsize car to meet its MY2025 footprint target (pp 8-18, 8-19).

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the other hand, believe that EPA's analysis is robust and that, if anything, EPA's assessment of technologies is overly conservative as we did not consider additional technologies expected to be in the market in the MY2022-2025 timeframe.

The EPA also has carefully considered comments and issues related to powertrain improvements, including advanced engine technologies and improvements to transmission technologies. See 76 FR 48763 and 77 FR 62784. A key technology the EPA assessed in the Draft TAR and Proposed Determination to be available at reasonable cost is the Atkinson Cycle engine in non-hybrid applications. The Atkinson Cycle architecture has already been demonstrated in production domestically (Mazda, Toyota, Hyundai-Kia), enhanced with cooled exhaust gas recirculation (Mazda), and in Europe further enhanced with cylinder deactivation (Volkswagen). These production examples are consistent with EPA engine modeling and initial hardware testing that shows synergies between the use of cooled exhaust gas recirculation and cylinder deactivation with Atkinson Cycle engines. See TSD Chapter 2.3.4.1.4. In addition, and as explained in TSD Chapter 2.3.4.1.8.3 and further below, the EPA conducted sensitivity analyses constraining penetration of Atkinson-cycle engines and found that there are other cost-effective compliance paths available which rely chiefly on engine technology alternatives, rather than on electrification. We did not receive information in the comments on the Proposed Determination that provided a basis for reaching a different conclusion. Among these alternative technology paths are increased penetration of gasoline direct injected, turbo-downsized engines (a chief technology in the agencies' 2012 FRM assessment). The EPA has carefully considered and addressed the comments questioning the effectiveness values the EPA estimated for this technology; the EPA continues to believe these estimates are well grounded. The EPA explained in detail why the engine configuration used in its effectiveness estimates is representative, why the friction reduction assumptions are sound based on the use of coatings and other materials and technologies throughout the engine's moving components, and why the production engines cited as alternatives in the comments are not representative of feasible effectiveness values in 2025 given that they lack various technologies that improve efficiency (including variable valve lift, external cooled exhaust gas recirculation, sequential turbocharging, and higher peak cylinder pressure capability). See TSD Chapter 2.3.4.1.9.1.

The EPA is projecting average per vehicle costs of $875 across the fleet (see Table ES-1 and Proposed Determination Table IV.5).[36] These costs are lower than those projected in the 2012 rule, which the EPA estimated at about $1,100 (see Table 12.44 of the Draft TAR). The EPA found in the 2012 rule that these (higher) costs were reasonable, even without considering the payback in the form of less fuel used, which more than offsets these costs. See 77 FR 62663-62665, 62880 and 62922. Consequently, the EPA regards these lower estimated per-vehicle costs to be reasonable. Furthermore, the projected reduced fuel expenditures more than offset the estimated increase in vehicle cost even with lower assumptions of fuel cost. EPA's analysis finds that consumers who finance their vehicle with a 5-year loan would see payback within the first year; consumers who pay cash for their vehicle would see payback in the fifth year of

[36] Across eight sensitivity cases, average per-vehicle costs ranged from $800-$1,115. See Proposed Determination Table IV.5.

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ownership. Consumers would realize net savings of $1,650 over the lifetime of their new vehicle (i.e., net of increased lifetime costs and lifetime fuel savings).

This decrease in estimated per-vehicle cost is not surprising—technology to achieve environmental improvements has often proved to be less costly than EPA's initial estimates.[37] Captured in these cost estimates, we project significant increases in the use of advanced engine technologies, comprising more than 60 percent of the fleet across a range of engines including turbo-downsized 18 bar and 24 bar, naturally-aspirated Atkinson cycle, and Miller cycle engines. We also see significant increases of advanced transmission technology projected to be implemented on more than 90 percent of the fleet, which includes continuously variable transmissions (CVTs) and eight-speed automatic transmissions. Stop-start technology and mild hybrid electrification are projected to be used on 15 percent and 18 percent, respectively, of the fleet. Similar to the analysis in the 2012 FRM, the EPA is projecting very low levels of strong hybrids (2 percent) and EV/PHEVs (5 percent) as absolute levels in the fleet (in the central case analysis, see Table ES-1).[38]

The EPA has considered the feasibility of the standards under several different scenarios of future fuel prices and fleet mix, as well as other sensitivity cases (e.g., different assumptions about technologies or credit trading) (see Proposed Determination Section IV.A and Appendix C), which showed only very small variations in average per-vehicle cost or technology penetration mix. Thus, our conclusion that there are multiple ways the MY2022-2025 standards can be met with a wide range of technologies at reasonable cost, and predominantly with advanced engine technologies, holds across all these scenarios.

These technology pathway findings are similar to the types of technologies that EPA projected in establishing the standards in the 2012 rule, although the specific technologies within the advanced engine, advanced transmission, and mild hybrid categories have been updated from the 2012 rule to reflect the current state of technological development (hence the lower estimated per vehicle cost than in the 2012 rule). For example, additional engine technologies, such as the naturally aspirated Atkinson cycle and Miller cycle noted above, were not even considered by the agencies in the 2012 rule yet are in production vehicles today. Similarly, transmission technology has developed such that CVTs are now emerging as a more popular choice for manufacturers than the dual-clutch transmissions we had mainly considered in 2012.[39] Mild hybrid technology also has developed, with more sophisticated 48-volt systems now offering a more cost-effective option than the 110-volt systems we had considered in the 2012 rule. The fact that these technologies have developed and improved so rapidly in the past four years since the MY2022-2025 standards were established provides a strong indication that the pace of innovation is likely to continue. The EPA expects that this trend will continue, likely affording

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[37] U.S. EPA, National Center for Environmental Economics (2014). "Retrospective Study of the Costs of EPA Regulations: A Report of Four Case Studies." EPA 240-F-14-001, https://yosemite.epa.gov/ee/epa/eerm.nsf/vwAN/EE-0575.pdf/$file/EE-0575.pdf including its literature review, Chapter 1.1.

[38] Note that a portion of the five percent EV/PHEV penetration is attributed to the California Zero Emission Vehicle (ZEV) program which is included in our reference case. See TSD Section 1.2.1.1. The incremental penetration of EV/PHEVs needed to meet the EPA GHG standards is projected to be less than one percent. See Proposed Determination Appendix C.1.1.3.2, Tables C.19-C.22, p. A-136-137.

[39] 77 FR 62852-62883; October 15, 2012.

ED_001276_00004660-00098

manufacturers even more technology options, and at potentially lower cost, than the Administrator was able to consider at this time for the Final Determination.

EPA's analysis indicates that the effectiveness of the technologies evaluated provides manufacturers with a feasible, reasonable mix of technologies that are predominantly in production today, though not always in combination. For example, a manufacturer may have moved to an advanced turbo-downsized engine design and applied aerodynamic improvements, but not yet applied more advanced transmission or applied further mass reduction opportunities. In addition, there are some straightforward improvements to these technologies that are anticipated and well-documented in the record. See, e.g., Proposed Determination TSD Chapters 2.2.3.4 through 2.2.3.11, and 2.2.7.2 through 2.2.7.5. Most of the automaker comments to the Proposed Determination regarding feasibility did not account for the possibility of using a broad slate of technologies in combination. A few manufacturers have shared with the EPA confidential business information illustrating technology walks (or "techwalks"), which show the cumulative effects of the application of various technologies applied to a given vehicle model. However, while the techwalks provided include some of the same advanced technologies considered by EPA, none of the techwalks include a fuller range of conventional technologies in the combinations described in the Proposed (and Final) Determination. Some are missing very reasonable vehicle technologies, some are missing very reasonable engine technologies, and some are missing very reasonable transmission technologies. Because the manufacturer example techwalks don't include all technologies in the appropriate combinations and in some cases don't include the appropriate credit values, the examples show a shortfall (as would be expected) of about 20-40 g/mi depending on the vehicle. This resulting gap between the EPA and manufacturer-supplied projections would be eliminated if a broader set of the available technologies described in the Final Determination were included in their analysis and appropriate credit values were used.

Moreover, the EPA believes there is ample lead time between now and MY2022-2025 for manufacturers to continue implementing additional technologies into their vehicle production such that the MY2022-2025 standards can be achieved.

In considering whether lead time for the MY2022-2025 standards is adequate, the EPA recognizes that these standards were first established in 2012, providing the auto manufacturers with up to 13 years of lead time for product planning to meet these standards. In the 2012 rule, the EPA concluded that, "EPA agrees that the long lead time in this rulemaking should provide additional certainty to manufacturers in their product planning. The EPA believes that there are several factors that have quickened the pace with which new technologies are being brought to market, and this will also facilitate regulatory compliance."[40] As noted, in setting the standards in 2012, the EPA was beginning to see that technologies were being brought to market at a quickened pace, and this trend has clearly continued over the past four years (see Proposed Determination Section II). The EPA's 2016 CO_2 and Fuel Economy Trends report provides even further evidence of the rapid pace at which manufacturers are bringing advanced technologies into the fleet. For example, GM, Honda and Hyundai have implemented advanced transmissions on 80-90 percent of their fleets within the past five years. Over that same period, GM and Ford have implemented turbocharged engines on 25 percent and 40 percent of their fleets,

[40] 77 FR 62880; October 15, 2012.

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respectively. Given that the EPA projects that the fleet as a whole could reach the 2025 standards with penetrations of 27 percent turbo-downsized 18 bar engines, and 7 percent turbo-downsized 24 bar engines, these penetration rates are clearly achievable given the pace with which some manufacturers have already implemented similar technologies.[41] With respect to the issue of lead time for the Atkinson engine technology, many of the building blocks necessary to operate an engine in Atkinson mode are already present in the MY2016 fleet (including gasoline direct injection (GDI), increased valve phasing authority, higher compression ratios, and (in some instances) cooled exhaust gas recirculation (cEGR)). Some of the potential packaging obstacles mentioned in comments, such as exhaust manifold design, should not be an impediment because more conventional manifold designs (not requiring a revamping of vehicle architecture) are both available and demonstrated in non-hybrid Atkinson cycle applications. There thus should be sufficient lead time before MY2022 to adopt the technology, since it could be incorporated without needing to be part of a major vehicle redesign.

Indeed, technology adoption rates and the pace of innovation have accelerated even beyond what EPA expected when initially setting these standards, which will further aid in addressing any potential for lead time concerns. By the time manufacturers must meet the MY2025 standards, since the standards were set in 2012, they will have had up to 13 years of lead time for product planning and at least 2-3 product redesign cycles, and at present manufacturers still have 5 to 8 years of lead time until the MY2022-2025 standards, with at least 1-2 redesign cycles.[42]

The EPA has also evaluated the progress of the existing fleet in meeting standards in future model years. See the Proposed Determination TSD Appendix C. This assessment shows that more than 100 individual MY2016 vehicle versions, or about 17 percent of the fleet, already meet future footprint-based CO_2 targets for MY2020 with current powertrains and air conditioning improvements. These figures do not include off-cycle credits in assessing compliance. In light of the fact that manufacturers are reporting an average of 3 g/mi of off-cycle credits across the fleet for 2015, with some manufacturers reporting more than 4 g/mi off-cycle credits, the share of the MY2016 fleet that can already meet the MY2020 footprint-based CO_2 targets -- four years ahead of schedule-- is actually even higher.

Notably, the majority of these vehicles are gasoline powertrains, and the vehicles include nearly every vehicle type, including midsize cars, SUVs, and pickup trucks, and span nearly every major manufacturer. It is important to note that because of the fleetwide averaging structure of the standards, not all vehicles are required to be below their individual targets, and in fact EPA expects that manufacturers will be able to comply with the standards with roughly 50 percent of their production meeting or falling below the footprint based targets. This analysis is another indication that the fleet is on track to meet future standards, especially given the 5 to 8 years of lead time remaining to MY2022-2025.

Consequently, evaluating the factors the EPA is required to consider under 40 CFR 86.1818(h)(1) (i), (ii), and (iii) of the mid-term evaluation rules, based on the current record before the Administrator, there is available and effective technology to meet the MY2022-2025 standards, it is available at reasonable cost to the producers and purchasers of new motor

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[41] EPA 2016 CO_2 and Fuel Economy Trends Report, Figures 6.2, 6.3 and 6.5.

[42] Redesign cycles are summarized in the Proposed Determination Appendix A and are discussed in greater detail in the 2012 FRM final Joint Technical Support Document, EPA-420-R-12-901, at Chapter 3.5.1.

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vehicles or new motor vehicle engines, there is adequate lead time to meet those standards, and the standards are thus feasible and practicable. Moreover, this most recent analysis remains consistent with the key conclusions reached in the 2012 FRM: there are multiple compliance paths based chiefly on deployment of advanced gasoline engine technologies with minimal needed penetration of strong hybrid or full electric vehicles, projected per vehicle costs are lower than in the 2012 FRM, and the cost of the lower emitting technology is fully paid back by the associated fuel savings.

(iv) The impact of the standards on reduction of emissions, oil conservation, energy security, and fuel savings by consumers

The EPA also has considered the impact of the standards on reduction of emissions, oil conservation, energy security, and fuel savings by consumers, again as required by the Midterm Evaluation rules. Light-duty vehicles are significant contributors to the U.S. GHG emissions inventory—responsible for 61 percent of U.S. transportation GHG emissions and 16 percent of total U.S. GHG emissions in 2014—and thus must be a critical part of any program to reduce U.S. GHG emissions. EPA projects that the MY2022-2025 standards will reduce GHG emissions annually by more than 230 million metric tons (MMT) by 2050, and nearly 540 MMT over the lifetime of MY2022-2025 vehicles. See Proposed Determination Section IV.A.4, Table IV.6, and Appendix C.2. These projected GHG reductions associated with the MY2022-2025 standards are significant compared to total light-duty vehicle GHG emissions of 1,100 MMT in 2014.[43] See Proposed Determination Section IV and Table IV.6.

These standards are projected to reduce oil consumption by 50 billion gallons and to save U.S. consumers nearly $92 billion in fuel cost over the lifetime of MY2022-2025 vehicles. See Proposed Determination Table IV.8 and IV.13, respectively. On average for a MY2025 vehicle (compared to a vehicle meeting the MY2021 standards), consumers will save more than $2,800 in total fuel costs over that vehicle's lifetime, with a net savings of $1,650 after taking into consideration the upfront increased vehicle costs. See Proposed Determination Table IV.12, 3 percent discount rate case. EPA considers a range of societal benefits of the standards, including the social costs of carbon and other GHGs, health benefits, energy security, the value of time saved for refueling, and others.

Benefits are projected to far outweigh the costs, with net benefits totaling nearly $100 billion over the lifetime of MY2022-2025 vehicles (3 percent discount rate). See Proposed Determination Section IV.A.6 and Table IV.13. As was the case when the EPA first established the MY2022-2025 standards in the 2012 rule, this analysis also supports a conclusion that the standards remain appropriate – and indeed will provide enormous benefits -- from the standpoint of impacts of the standards on emissions, oil conservation, energy security, and fuel savings.

(v) The impact of the standards on the automobile industry

EPA has assessed the impacts of the standards on the automobile industry. We have estimated the costs required to meet the MY2022-2025 standards at about $33 billion (see

[43] Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2014, EPA 430-R-16-002, April 15, 2016.

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Proposed Determination Section IV.A and Table IV.13), with an average per-vehicle cost of about $875 (see Proposed Determination Section IV.A and Tables IV.4 and IV.5). These costs are less than those originally projected when the EPA first established these standards in the 2012 rule; at that time, we had projected an average per vehicle cost of approximately $1,100 (see Table 12.44 of the Draft TAR). The Administrator found those (higher) projected costs to be reasonable in the 2012 rule, and finds the lower projected costs shown in our current analysis continues to support the appropriateness of the standards.

In addition to costs, the EPA has assessed impacts on the auto industry in terms of potential impacts on vehicle sales. See Proposed Determination Section III and Appendix B and TSD Chapter 4. As part of these assessments, the EPA has evaluated a range of issues affecting consumers' purchases of vehicles, which also addresses a portion of the factor, "the cost on the producers or purchasers of new motor vehicles or new motor vehicle engines" (emphasis added, 40 CFR 86.1818-12(h)(ii)). EPA's assessments indicate that, to date, there is little, if any, evidence that consumers have experienced adverse effects from the standards. Vehicle sales continue to be strong, with annual increases for seven straight years, through 2016, for the first time in 100 years, and record sales in 2016. These sales increases are likely due not to the standards, but rather to economic recovery from the 2008-2009 recession. Nevertheless, at the least, we find no evidence that the standards have impeded sales. We also have not found any evidence that the technologies used to meet the standards have imposed "hidden costs" in the form of adverse effects on other vehicle attributes. See Proposed Determination Appendix B.1.4 and B.1.5.2. Similarly, we have not identified significant effects on vehicle affordability to date. See Proposed Determination Appendix B.1.6. We recognize that the standards will have some impact on the price of new vehicles, but we do not believe that the standards have significantly reduced the availability of vehicle model choices for consumers at any particular price point, including the lowest price vehicle segment. Id. at Appendix B.1.6.1. Given the lead time provided since the 2012 rule for automakers to achieve the MY2022-25 standards, and the evidence to date of consumer acceptance of technologies being used to meet the standards, the EPA expects that any effects of the standards on the vehicle market will be small relative to market responses to broader macroeconomic conditions.

The main argument in the public comments on both the Draft TAR and the Proposed Determination that the standards will have an adverse impact on the industry is that the standards, although achievable, will require extensive electrification of the fleet to do so, and this will result in more expensive vehicles -- and an emerging technology -- which consumers will be reluctant to purchase. Our analysis, however, indicates that there are multiple compliance pathways which would need only minimal (less than 3 percent) of strong hybrids and electric vehicles, and that the great bulk of technologies used would be based on improvements to gasoline internal combustion engines. This is true not only in the agency's primary analysis, but also in a series of sensitivity analyses (assuming, among other things, significantly less use of the Atkinson engine technology, and a wide range of fuel prices). See Table ES-1 and the Proposed Determination Section IV.A.3 and Appendix C.1. This analysis is also consistent with findings of the 2015 NAS study (as well as each agency's findings in the 2012 FRM).[44] Consequently, the EPA does believe that the evidence supports the claim of the comments on this point.

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[44] "Cost, Effectiveness and Deployment of Fuel Economy Technologies for Light-Duty Vehicles," National Research Council of the National Academies, June 2015.

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The EPA also carefully considered the issue of whether there has been consumer acceptance of the new fuel efficiency technologies. As noted, industry sales are at a record high, with sales increasing for seven consecutive years for the first time since the 1920's. These sales trends provide no evidence of consumer reluctance to purchase the new technologies. Moreover, professional auto reviews found generally positive associations with the existence of the technologies. See Section B.1.5.1.2 of the Appendix to the Proposed Determination. The evidence to date thus supports consumer acceptance of the new technologies.

Another potential impact on the automobile industry that the EPA has assessed is the potential for impacts on employment. EPA's assessment projects job growth in the automotive manufacturing sector and automotive parts manufacturing sector due specifically to the need to increase expenditures for the vehicle technologies needed to meet the standards. We do not attempt to quantitatively estimate the total effects of the standards on the automobile industry, due to the significant uncertainties underlying any estimate of the impacts of the standards on vehicle sales. Nor do we quantitatively estimate the total effects on employment at the national level, because such effects depend heavily on the state of overall employment in the economy. We further note that, under conditions of full employment, any changes in employment levels in the regulated sector due to the standards are mostly expected to be offset by changes in employment in other sectors. See the Proposed Determination Appendix B.2. The Administrator finds that, while the standards are likely to have some effect on employment, this effect (whether positive or negative) is likely to be small enough that it will be unable to be distinguished from other factors affecting employment, especially macroeconomic conditions and their effect on vehicle sales.

The Administrator thus finds, based on the current record, that the standards will impose reasonable per vehicle costs (and less than those projected in the 2012 FRM), that there is no evidence of the standards having an adverse impact on vehicle sales or on other vehicle attributes, or on employment in the automotive industry sector. Given these assessments of potential impacts on costs to the auto industry and average per-vehicle costs, consumers' purchases of vehicles, and employment, the Administrator finds that the potential impacts on the automobile industry support a conclusion that the MY2022-2205 standards remain appropriate and should not be changed.

(vi) The impacts of the standards on automobile safety

The EPA has assessed the potential impacts of the standards on automobile safety. In the Proposed Determination, consistent with the Draft TAR's safety assessment, the EPA assessed the potential of the MY2022-2025 standards to affect vehicle safety. In the Draft TAR (Chapter 8), the agencies reviewed the relationships between mass, size, and fatality risk based on the statistical analysis of historical crash data, which included a new analysis performed by using the most recent available crash data. The EPA used this updated analysis[45] in the Proposed Determination to calculate the estimated safety impacts of the modeled mass reductions over the lifetimes of new vehicles in response to MY2022-2025 standards. See the Proposed

[45] Puckett, S.M. and Kindelberger, J.C. (2016, June). Relationships between Fatality Risk, Mass, and Footprint in Model Year 2003-2010 Passenger Cars and LTVs – Preliminary Report. Washington, DC: National Highway Traffic Safety Administration.

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Determination Section III.C.1 and Appendix B.3.1. EPA's analysis finds that the fleet can achieve modest levels of mass reduction as one technology among many to meet the MY2022-2025 standards without any net increase in fatalities. The 2015 NAS study further found that the footprint-based standards are likely to have little effect on vehicle and overall highway safety.[46] Therefore, the Administrator finds that the existing MY2022-2025 standards will have no adverse impact on automobile safety. There is no evidence in the public comments that suggests a different conclusion.

(vii) The impact of the greenhouse gas emission standards on the corporate average fuel economy standards and a national harmonized program

The EPA has assessed the impacts of the standards on the CAFE standards and a national harmonized program. EPA notes that NHTSA has established augural standards for MY2022-2025 and must by statute undertake a *de novo* notice and comment rulemaking to establish final standards for these model years. Under the Energy Policy and Conservation Act (EPCA) statute, as amended by the Energy Independence and Security Act (EISA), NHTSA must establish final standards at least 18 months before the beginning of each model year.[47] That statute requires the Secretary of Transportation to consult with the EPA Administrator in establishing fuel economy standards.[48] The EPCA/EISA statute includes a number of factors that NHTSA must consider in deciding maximum feasible average fuel economy, including "the effect of other motor vehicle standards of the Government on fuel economy."[49] Thus, in determining the CAFE standards for MY2022-2025, NHTSA can take into consideration the light-duty GHG standards, and indeed did so in initially establishing the MY2017-2021 CAFE standards and the augural MY2022-2025 standards. See 77 FR 62669, 62720, 62803-804. The EPA believes that by providing information on our evaluation of the current record and our determination that the existing GHG standards for MY2022-2025 are appropriate, we are enabling, to the greatest degree possible, NHTSA to take this analysis and the GHG standards into account in considering the appropriate CAFE standards for MY2022-2025.

The EPA recognizes that in 2012, when we discussed the mid-term evaluation, we expressed an intent that if EPA's determination was that the standards should not change, the EPA would issue its final determination concurrently with NHTSA's final rule adopting fuel economy standards for MY2022-2025. See 77 FR at 62633. Our intent was to align the agencies' proceedings for MYs 2022-2025 and to maintain a joint national program. *Id.* The EPA remains committed to a joint national program that aligns, as much as possible, the requirements of EPA, NHTSA, and CARB. The Administrator concludes, however, that providing her determination that the GHG standards remain appropriate now, rather than waiting until after NHTSA has proposed standards, allows NHTSA to fully account for the GHG standards and is more likely to align the agencies' determinations. Thus, the Administrator finds that her determination takes

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[46] "Cost, Effectiveness and Deployment of Fuel Economy Technologies for Light-Duty Vehicles," National Research Council of the National Academies, June 2015, Finding 10.2.
[47] 42 U.S.C. 32902(a).
[48] 42 U.S.C. 32902(b)(1).
[49] 42 U.S.C. 32902(f).

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account of the relationship between GHG standards and fuel economy standards and supports the goal of a national harmonized program.[50]

In an action separate from this Final Determination, the EPA will be responding to a petition received from the auto industry trade associations, the Alliance of Automobile Manufacturers and Global Automakers, regarding several provisions that they request be harmonized between the EPA GHG standards and the NHTSA CAFE standards.[51] On December 21, 2016, NHTSA signed a Federal Register notice signaling its plan to consider the NHTSA-specific requests from the auto industry petition. The EPA likewise intends, in the near future, to continue working together with NHTSA, the Petitioners and other stakeholders, as we carefully consider the requests made in the June 2016 petition, and possible ways to further harmonize the national program.

(viii) The impact of the standards on other relevant factors

In addition to the above factors, the Administrator has also considered the factor of regulatory certainty -- which relates closely to the issue of lead time discussed above. Regulatory certainty gives the automakers the time they need to conduct long-term planning and engineering to meet future standards. Indeed, the 2012 standards covered a long period of time – 13 years—in order to provide the industry with a lengthy period of stability and certainty. Thus, the Midterm Evaluation called for rule changes only if the Administrator found the existing standards to be no longer feasible and appropriate. Clearly, as discussed above, the automakers' response to technology development and deployment in the face of the regulatory certainty provided by the MY2012-2021 standards, which are not subject to the midterm evaluation, has exceeded EPA's projections set out in the original 2012 rule. Having the same certainty on the level of the MY2022-2025 standards can now enable manufacturers to continue unimpeded their existing long-term product planning and technology development efforts, which, in turn, could lead to even further, and perhaps sooner, breakthroughs in technology. These efforts could contribute to the continued success of the industry and the GHG standards program, which in turn would benefit consumers through fuel savings and the public through reduced emissions. Initiating a rulemaking now to change the standards would disrupt the industry's planning for future product lines and investments. Thus, the Administrator finds that regulatory certainty is an important consideration in assessing the appropriateness of the standards.

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[50] The MTE rules themselves do not require concurrent timing with any aspect of NHTSA's rulemaking. Moreover, there is uncertainty as to whether the NHTSA rulemaking would be complete by the date on which EPA is mandated to make a final determination, so that the expressed hope (in the 2012 preamble) of concurrent proceedings may be overtaken by events in any case.

[51] "Petition for Direct Final Rule with Regard to Various Aspects of the Corporate Average Fuel Economy Program and the Greenhouse Gas Program," submitted by the Alliance of Automobile Manufacturers and the Association of Global Automakers to EPA and NHTSA, June 20, 2016.

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III. Final Determination

Having considered available information on each of the above factors required by the regulations, under 40 CFR 86.1818-12(h)(1), the Administrator is determining that the GHG standards currently in place for MYs 2022-2025 are appropriate under section 202(a)(1) and (2) of the Clean Air Act. The Administrator has fully considered public comments submitted on the Proposed Determination, and there has been no information provided through the comments that compels or persuades the Administrator to alter her Proposed Determination. The consequence of this final determination is a continuation of the current regulatory status quo. The regulations themselves are unaltered as a result of this determination.

In the Administrator's view, the record clearly establishes that, in light of technologies available today and improvements we project will occur between now and MY2022-2025, it will be practical and feasible for automakers to meet the MY2022-2025 standards at reasonable cost that will achieve the significant GHG emissions reduction goals of the program, while delivering significant reductions in oil consumption and associated fuel savings for consumers, significant benefits to public health and welfare, and without having material adverse impact on the industry, safety, or consumers. The Administrator recognizes that not all of the technologies available today have been implemented in a widespread manner, but she also recognizes that the purpose of the Midterm Evaluation is to assess whether the standards remain appropriate in light of the pace of compliance and technological development in the industry. As discussed above, the technological development of advanced gasoline vehicle technologies has surpassed EPA's expectations when we initially adopted the standards. Although we anticipated in 2012 that the standards could be met primarily using advanced gasoline engine and transmission technologies, the range of technology development has been more extensive and effective than anticipated. The industry's vibrancy, initiative, and ingenuity is to be commended. The Administrator concludes that the MY2022-2025 standards could be largely met simply by implementation of these technologies, but we recognize that we are at the mid-point of these standards phasing-in and it would be unreasonable, in light of past developments, ongoing investment by the industry, and EPA's extensive review of the literature on future technologies and improvements to existing technologies, to expect that no further technology development would occur that could be implemented for MY2022-2025 vehicles. In the Draft TAR and Proposed Determination, the EPA was not even able to consider all of the technologies being developed because of the rapid pace of development. As discussed in the Proposed Determination (see Section II and Appendix B), the EPA did not consider several technologies that we know are under active development and may potentially provide additional cost-effective technology pathway options for meeting the MY2025 standards; examples of such technologies include electric boosting, dynamic cylinder deactivation, and variable compression ratio. A significant difference between the industry analysis and that of the EPA is over the extent to which electric vehicle production will be needed to meet the standards. Many of industry's comments regarding cost, consumer acceptance, and other factors primarily stem from their view that significant EV penetration will be required. As discussed earlier, the Administrator has considered the report of the National Academy of Sciences and information and data from the auto industry, and she has determined based on the technical record before her that the industry's conclusions do not take into account the possibility of applying the full range of road load reduction and non-electrified powertrain technologies broadly across high volume models, and in the combinations, that the EPA assessed in the Proposed Determination and Draft TAR. In addition, the automotive industry has been

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characterized throughout its history by continued innovation and adoption of ever-improving technologies to improve fuel economy and lower emissions while simultaneously providing a range of vehicles to customers with the features they desire (safety, driveability, etc.). Thus, in light of the pace of progress in reducing GHG emissions since the MY2022-2025 standards were adopted, the success of automakers in achieving the standards to date while vehicle sales are strong, the projected costs of the standards, the impact of the standards on reducing emissions and fuel costs for consumers, and the other factors identified in 40 CFR 86.1818-12(h) and discussed above, the Administrator concludes that the record does not support a conclusion that the MY2022-2025 standards should be revised to make them less stringent.

The Administrator has also considered whether, in light of these factors and the record (including public comments urging more stringent standards), it would be appropriate to make the standards more stringent. She recognizes 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 MY2022-2025 (or, put more precisely, could support a decision to initiate rulemaking proposing to amend the standards to increase their stringency). The EPA found in 2012 that the projected standards were feasible at reasonable cost, and the current record shows that the standards are feasible at even less cost and that there are more available technologies (particularly advanced gasoline technologies) than projected in 2012, and that the benefits outweigh the costs by nearly $100 billion. These factors could be the basis for a proposal to amend the standards to increase the standards' stringency. Moreover, one could point to the overall need to significantly reduce greenhouse gases in the transportation sector even further, especially given expected growth in vehicle travel. The Administrator also recognizes, however, that regulatory certainty is an important and critical consideration. Regulatory certainty gives the automakers the time they need to conduct long-term planning and engineering that could lead to major advancements in technology while contributing to the continued success of the industry and the GHG standards program, which in turn will benefit consumers and reduce emissions. She also believes a decision to maintain the current standards provides support to a timely NHTSA rulemaking to adopt MY2022-2025 standards and a harmonized national program. Thus, the Administrator has concluded that it is appropriate to provide the full measure of lead time for the MY2022-2025 standards, rather than initiating rulemaking to adopt new, more stringent standards with a shorter lead time and significant uncertainty in the interim which would impede on-going technological improvements and innovation.

Accordingly, the Administrator concludes that in light of all the prescribed factors, and considering the entire record, the current MY2022-2025 standards are appropriate.

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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

Executive Summary

United States Environmental Protection Agency
California Environmental Protection Agency Air Resources Board
NHTSA National Highway Traffic Safety Administration

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

Executive Summary

Office of Transportation and Air Quality
U.S. Environmental Protection Agency

National Highway Traffic Safety Administration
U.S. Department of Transportation

And

California Air Resources Board

EPA-420-D-16-901
July 2016

Executive Summary

The Environmental Protection Agency (EPA) and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) have established a coordinated program for Federal standards for greenhouse gas (GHG) emissions and corporate average fuel economy (CAFE) for light-duty vehicles.[1] This program was developed in cooperation and alignment with the California Air Resources Board (CARB) to ensure a single National Program. The National Program established standards that increase in stringency year-over-year from model year (MY) 2012 through MY2025 for EPA and through MY2021 for NHTSA. California adopted the first in the nation GHG standards for light-duty vehicles in 2004 for MY2009-2016, and in 2012 for MY2017-2025, followed by amendments that allow compliance with the Federal GHG standards as compliance with the California GHG standards, in furtherance of a single National Program. Under the National Program, consumers continue to have a full range of vehicle choices that meet their needs, and, through coordination with the California standards, automakers can build a single fleet of vehicles across the U.S. that satisfies all GHG/CAFE requirements. In the agencies' 2012 final rules establishing the MY2017-2025 standards for EPA and 2017-2021 final and 2022-2025 augural standards for NHTSA, the National Program standards were projected by MY2025 to double fuel economy and cut GHG emissions in half, save 6 billion metric tons of carbon dioxide (CO_2) pollution and 12 billion barrels of oil over the lifetime of MY2012-2025 vehicles, and deliver significant savings for consumers at the gas pump.

The rulemaking establishing the National Program for MY 2017-2025 light-duty vehicles included a regulatory requirement for EPA to conduct a Midterm Evaluation (MTE) of the GHG standards established for MYs 2022-2025.[i] The 2012 final rule preamble also states that "[t]he mid-term evaluation reflects the rules' long time frame, and, for NHTSA, the agency's statutory obligation to conduct a de novo rulemaking in order to establish final standards for MYs 2022-2025." NHTSA will consider information gathered as part of the MTE record, including information submitted through public comments, in the comprehensive *de novo* rulemaking it must undertake to set CAFE standards for MYs 2022-2025.[ii] Through the MTE, EPA must determine no later than April 1, 2018 whether the MY2022-2025 GHG standards, established in 2012, are still appropriate under section 202 (a) of the Clean Air Act, in light of the record then before the Administrator, given the latest available data and information.[iii] EPA's decision could go one of three ways: the standards remain appropriate, the standards should be less stringent, or the standards should be more stringent. EPA and NHTSA also are closely coordinating with CARB in conducting the MTE to better ensure the continuation of the National Program. The MTE will be a collaborative, data-driven, and transparent process and must entail a holistic assessment of all the factors considered in the initial standards setting.[iv]

This Draft Technical Assessment Report (TAR), issued jointly by EPA, NHTSA, and CARB for public comment, is the first formal step in the MTE process.[v] In this Draft TAR, the agencies examine a wide range of technical issues relevant to GHG emissions and augural CAFE standards for MY2022-2025, and share with the public the initial technical analyses of those issues. This is a technical report, not a policy or decision document. The information in this

[1] The agencies finalized the first set of National Program standards covering model years (MYs) 2012-2016 in May 2010[1] and the second set of standards, covering MYs 2017-2025, in October 2012.

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report, and in the comments we receive on it, will inform the agencies' subsequent determination and rulemaking actions. The agencies will fully consider public comments on this Draft TAR as they continue to update and refine the analyses for further steps in the MTE process.

In this Draft TAR, EPA provides its initial technical assessment of the technologies available to meet the MY2022-2025 GHG standards and one reasonable compliance pathway, and NHTSA provides its initial assessment of technologies available to meet the augural MY2022-2025 CAFE standards and a different reasonable compliance pathway. Given that there are multiple possible ways that new technologies can be added to the fleet, examining two compliance pathways provides valuable additional information about how compliance may occur. NHTSA and EPA also performed multiple sensitivity analyses which show additional possible compliance pathways. 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;
- 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;
- The car/truck mix reflects updated consumer trends that are informed by a range of factors including economic growth, gasoline prices, and other macro-economic trends. However, as the standards were designed to yield improvements across the light duty vehicle fleet, irrespective of consumer choice, updated trends are fully accommodated by the footprint-based standards.

Additionally, while the Draft TAR analysis focuses on the MY2022-2025 standards, the agencies note that the auto industry, on average, is over-complying with the first several years of the National Program. This has occurred concurrently with a period during which the automotive industry successfully rebounded after a period of economic distress. The industry has now seen six consecutive years of increases and a new all-time sales record in 2015, reflecting positive consumer response to vehicles complying with the standards.

A summary of each chapter of the Draft TAR follows.

Chapter 1: Introduction. This chapter provides a broad discussion of the National Program, explains further the MTE process and timeline, and provides additional background on NHTSA's CAFE program, EPA's GHG program, and California's GHG program. This chapter also includes an update on what the latest science tells us about climate change impacts, and the U.S.'s and California's commitments on actions to address climate change. Chapter 1 also provides a discussion of petroleum consumption and energy security.

Chapter 2: Overview of Agencies' Approach to Draft TAR Analysis. The agencies are committed to conducting the MTE through a collaborative, data-driven, and transparent process. In gathering data and information for this Draft TAR, the agencies drew from a wide range of sources to evaluate how the automotive industry has responded into the early years of the National Program, how technology has developed, and how other factors affecting the light-duty vehicle fleet have changed since the final rule in 2012. The agencies found that there is a wealth of information since the 2012 final rule upon which to inform this Draft TAR, and this

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information is detailed throughout the document. Chapter 2 describes these sources, including extensive state-of-the-art research projects by experts at the EPA National Vehicle and Fuel Emissions Laboratory, as well as consultants to the agencies, data and input from stakeholders, and information from technical conferences, published literature, and studies published by various organizations. A significant study informing the agencies' analyses is the National Academy of Sciences 2015 report[vi] on fuel economy technologies, which the agencies highlight in Chapter 2, and discuss throughout this document.

The analyses presented in this Draft TAR reflect the new data and information gathered by the agencies thus far, and the agencies will continue to gather and evaluate more up-to-date information, including public comments on this Draft TAR, to inform our future analyses. The agencies have conducted extensive outreach with a wide range of stakeholders – including auto manufacturers, automotive suppliers, non-governmental organizations (NGOs), consumer groups, labor unions, automobile dealers, state and local governments, and others.

Chapter 3: Recent Trends in the Light-Duty Vehicle Fleet since the 2012 Final Rule. This chapter summarizes trends in the light-duty vehicle market in the four years since the 2012 final rule, including changes in fuel economy/GHG emissions, vehicle sales, gasoline prices, car/truck mix, technology penetrations, and vehicle power, weight and footprint. Since the 2012 final rule, vehicle sales have been strong, hitting an all-time high of 17.5 million vehicles in 2015, gas prices have dropped significantly, and truck share has grown. At the same time, fuel economy technologies are entering the market at rapid rates. The agencies provide the latest available projections for vehicle sales, gasoline prices, and fleet mix out to 2025, and compare those to projections made in the 2012 final rule. This chapter also highlights compliance to date with the GHG and CAFE standards, where, for the first three years of the program (MY2012-2014), auto manufacturers have over-complied with the program.

Chapter 4: Baseline and Reference Vehicle Fleets. This chapter describes the agencies' methodologies for developing a baseline fleet of vehicles and future fleet projections out to MY2025. The GHG analysis uses a baseline fleet based on the MY2014 fleet, the latest year available for which there are final GHG compliance data. The CAFE analysis uses a MY2015 baseline fleet based on MY2015 data and sales projections provided by manufacturers in the latter half of MY2015, when production was well underway. These data sets complement one another and each yield important perspective, with the MY2014 data having the benefit of validation through compliance data, and the MY2015 data providing more recent perspective. The GHG and CAFE analysis fleets utilized similar, but separate, purchased projections from IHS-Polk for the future vehicle fleet mix out to 2025, thereby representing some of the uncertainty inherent in all reference case projections. Both analyses used data from the Energy Information Administration's Annual Energy Outlook 2015 (AEO 2015) as the basis for total vehicle sales projections to 2025, as well as for the car and truck volume mix. Although the agencies have relied on different data sources in development of the baseline fleets, we believe this combination of approaches strengthens our results by showing robust results across a range of reference case projections.

Chapter 5: Technology Costs, Effectiveness, and Lead-Time Assessment. This chapter is an in-depth assessment of the state of vehicle technologies to improve fuel economy and reduce GHG emissions, as well as the agencies' assessment of expected future technology developments through MY2025. The technologies evaluated include all those considered for the 2012 final

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rule, as well as new technologies that have emerged since then. Every technology has been reconsidered with respect to its cost, effectiveness, application, and lead-time considerations, with emphasis on assessing the latest introductions of technologies to determine if and how they have changed since the agencies' assessment in the 2012 final rule. These efforts reflect the significant rate of progress made in automotive technologies over the past four years since the MY2017-2025 standards were established. Technologies considered in this Draft TAR include more efficient engines and transmissions, aerodynamics, light-weighting, improved accessories, low rolling resistance tires, improved air conditioning systems, and others. Beyond the technologies the agencies considered in the 2012 final rule, manufacturers are now employing several technologies, such as higher compression ratio, naturally aspirated gasoline engines, and greater penetration of continuously variable transmissions (CVTs); other new technologies are under active development and are expected to be in the fleet well before MY2025, such as 48-volt mild hybrid systems.

In Chapter 5, the agencies also provide details on the specific technology assumptions used respectively by EPA for the GHG assessment and by NHTSA for the CAFE assessment in this Draft TAR, including the specific assumptions that EPA and NHTSA each made for each technology's cost and effectiveness, and lead-time considerations. The agencies' estimates of technology effectiveness were informed by vehicle simulation modeling approaches; NHTSA utilized the Autonomie model developed by Argonne National Laboratories for the Department of Energy (DOE), and EPA used its Advanced Light-duty Powertrain and Hybrid Analysis (ALPHA) model. The agencies look forward to public comment in this and other areas to help advance collective forecasting of technology effectiveness in the out years of the program.

It is clear that the automotive industry is innovating and bringing new technology to market at a rapid pace and neither of the respective agency analyses reflects all of the latest and emerging technologies that may be available in the 2022-2025 time frame. For example, the agencies were not able for this Draft TAR to evaluate the potential for technologies such as electric turbo-charging, variable compression ratio, skip-fire cylinder deactivation, and P2-configuration mild-hybridization. These technologies may provide further cost-effective reductions in GHG emissions and fuel consumption. The agencies will continue to update their analyses throughout the MTE process as new information becomes available.

Chapter 6: Assessment of Consumer Acceptance of Technologies that Reduce Fuel Consumption and GHG Emissions. This chapter reviews issues surrounding consumer acceptance of the vehicle technologies expected to be used to meet the MY2022-2025 standards. Since the program has been in effect since MY2012, the agencies focus on the evidence to date related to consumer acceptance of vehicles subject to the National Program standards. This evidence includes an analysis of how professional auto reviewers assess fuel-saving technologies. For each technology, positive evaluations exceed negative evaluations, suggesting that it is possible to implement these technologies without significant hidden costs. To date, consumer response to vehicles subject to the standards is positive. Chapter 6 also discusses potential impacts of the standards on vehicle sales and affordability, which are closely interconnected with the effects of macroeconomic and other market forces. Based on the agencies' draft assessments, the reduced operating costs from fuel savings over time are expected to far exceed the increase in up-front vehicle costs, which should mitigate any potential adverse effects on vehicle sales and affordability.

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Chapter 7: Employment Impacts. This chapter discusses the effects of employment in the automotive sector to date, and the projected effects of the MY 2022-2025 standards on employment. Employment in the automotive industry dropped sharply during the Great Recession, but has increased steadily since 2009. The primary employment effects of these standards are expected to be found in several key sectors: auto manufacturers, auto parts manufacturing, auto dealers, fuel production and supply, and consumers. The MY2025 standards are likely to have some effect on employment, due to both the effects of the standards on vehicle sales, and the need to produce new technologies to meet the standards. Nevertheless, the net effect of the standards on employment is likely to be small compared to macroeconomic and other factors affecting employment.

Chapter 8: Assessment of Vehicle Safety Effects. This chapter assesses the estimated overall crash safety impacts of the MY 2022-2025 standards. In this chapter, the agencies first review the relationships between mass, size, and fatality risk based on the statistical analysis of historical crash data, which includes the new analysis performed by using the most recent crash data. The updated NHTSA analysis develops five parameters for use in both the NHTSA and EPA assessments to calculate the estimated safety impacts of the modeled mass reductions over the lifetimes of new vehicles in response to MY 2022-2025 GHG standards and augural CAFE standards. Second, to examine the impact of future lightweight vehicle designs on safety, the agencies also reviewed a fleet crash simulation study that examined frontal crashes using existing and future lightweight passenger car and cross-over utility vehicle designs. The study found a relationship between vehicle mass reduction and safety that is directionally consistent with the overall risk for passenger cars from the NHTSA 2016 statistical analysis of historical crash data. Next, the agencies investigate the amount of mass reduction that is affordable and feasible while maintaining overall fleet safety and as well as functionality such as durability, drivability, noise, vibration and handling (NVH), and acceleration performance. Based on those approaches, the agencies further discuss why the real world safety effects might be less than or greater than calculated safety impacts, and what new challenges these lighter vehicles might bring to vehicle safety and potential countermeasures available to manage those challenges effectively.

Chapter 9: Assessment of Alternative Fuel Infrastructure. This chapter assesses the status of infrastructure for alternative fueled vehicles, with emphasis on two technologies the agencies believe will be important for achieving longer-term climate and energy goals – plug-in electric vehicles (PEVs) and fuel cell electric vehicles (FCEVs). The agencies also discuss infrastructure for ethanol (E85) flex-fueled vehicles and natural gas vehicles. The agencies' assessment is that, as we concluded in the 2012 rule, high penetration levels of alternative fueled vehicles will not be needed to meet the MY2025 standards, with the exception of a very small percentage of PEVs, and that infrastructure is progressing sufficiently to support vehicles from those manufacturers choosing to produce alternative fueled vehicles to meet the MY2022-2025 standards. The majority of PEV charging occurs at home, and national PEV infrastructure in public and work locations is progressing appropriately. Hydrogen infrastructure developments are addressing many of the initial challenges of simultaneously launching new vehicle and fueling infrastructure markets, and current efforts in California and the northeast states will facilitate further vehicle and infrastructure rollout at the national level.

Chapter 10: Economic and Other Key Inputs Used in the Agencies' Analyses. This chapter describes many of the economic and other inputs used in the agencies' analyses. This

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chapter discusses the methodologies used to assess inputs such as the real-world fuel economy/GHG emissions gap, vehicle miles traveled (VMT), vehicle survival rates, the VMT rebound effect, energy security, the social cost of carbon and other GHGs, health benefits, consumer cost of vehicle ownership, and others.

Chapter 11: Credits, Incentives and Flexibilities. The National Program was designed with a wide range of optional compliance flexibilities to allow manufacturers to maintain consumer choice, spur technology development, and reduce compliance costs, while achieving significant GHG and oil reductions. Chapter 11 provides an informational overview of all of these compliance flexibilities, with particular emphasis on those flexibility options likely to be most important in the MY2022-2025 timeframe.

Chapter 12: Analysis of the MY2022-2025 GHG Standards; and **Chapter 13: Analysis of Augural CAFE Standards.** Chapters 12 and 13 provide results, respectively, of EPA's initial technical assessment of the technologies available to meet the MY2022-2025 GHG standards (i.e., the footprint-based standard curves) and their costs, and NHTSA's initial technical assessment of technologies capable of meeting CAFE standards corresponding to the augural standards for MY2022-2025, and these technologies' costs. CARB has not conducted an independent analysis, but has participated in both EPA's and NHTSA's analyses. Although all three agencies have been working collaboratively in an array of areas throughout the development of this Draft TAR, the EPA GHG and NHTSA CAFE assessments were done largely independently. These independent analyses were done in part to recognize differences in the agencies' statutory authorities and to reflect independent choices regarding some of the modeling inputs used at this initial stage of our evaluation. The agencies believe that independent and parallel analyses can provide complementary results. The agencies further believe that, for this Draft TAR which is the first step of the Midterm Evaluation process, it is both reasonable and advantageous to make use of different data sources and modeling tools, and to show multiple pathways for potential compliance with the MY 2022-2025 GHG standards and augural CAFE standards.

As noted above, although CARB did not perform its own modeling assessment of the costs and technologies to meet the 2022-2025 GHG and CAFE requirements, it was integrally involved in analyzing the underlying technology cost and effectiveness inputs to the EPA and NHTSA modeling. CARB believes that the analyses presented in this Draft TAR appropriately present a range of technologies that could be used to meet the requirements. However, as discussed above, there are, and will continue to be, emerging technologies that may well be available in the 2022-2025 timeframe and could perform appreciably better or be lower cost than the technologies modeled in this Draft TAR. Such technologies are exemplified by recent advancements already seen in the marketplace yet not anticipated by the agencies' rule four years ago (e.g., expanded use of higher compression ratio, naturally aspirated gasoline engines). Vehicle manufacturers have historically outpaced agency expectations and CARB believes it is likely that industry will continue to do so.

In this Draft TAR, NHTSA does not present alternatives to the augural standards because, as the first stage of the Midterm Evaluation process, the TAR is principally an exploration of technical issues -- including assumptions about the effectiveness and cost of specific technologies, as well as other inputs, methodologies and approaches for accounting for these issues. The agencies seek comment from stakeholders to further inform the analyses, in advance

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of the NHTSA rulemaking and the EPA Proposed Determination. For the purposes of clearly reflecting the impacts of updated technology assumptions relative to a familiar point of comparison, both agencies have run their respective models using the stringency levels included in NHTSA's augural standards, and EPA's existing GHG standards through MY2025. However, the technology assumptions and other analyses presented in this Draft TAR, which will be informed by public comment, will support the development of a full range of stringency alternatives in the subsequent CAFE Notice of Proposed Rulemaking.

In this Draft TAR, the EPA GHG and NHTSA CAFE assessments both show that the MY2022-2025 standards can be achieved largely through the use of advanced gasoline vehicle technologies with modest penetrations of lower cost electrification (like 48 volt mild hybrids which include stop/start) and low penetrations of higher cost electrification (like strong hybrids, plug-in hybrid electric vehicles, and all electric vehicles). Given the rapid pace of automotive industry innovation, the agencies may consider effectiveness and cost of additional technologies as new information, including comments on this Draft TAR, becomes available for further steps of the Midterm Evaluation.

Based on various assumptions including the Annual Energy Outlook 2015 (AEO 2015) reference case projections of the car/truck mix out to 2025, the footprint-based GHG standards curves for MY2022-2025 are projected to achieve an industry-wide fleet average CO_2 target of 175 grams/mile (g/mi) in MY2025, and the augural CAFE standards are projected to result in average CAFE requirements increasing from 38.3 mpg in MY2021 to 46.3 mpg in MY2025. The projected fleet average CO_2 target represents a GHG emissions level equivalent to 50.8 mpg (if all reductions were achieved exclusively through fuel economy improvements).[2]

Table ES-1 below compares two additional AEO 2015 scenarios in addition to the AEO 2015 reference case: a low fuel price case and a high fuel price case. As shown, these fuel price cases translate into different projections for the car/truck fleet mix (e.g., with a higher truck share shown in the low fuel price case, and a lower truck share shown in the high fuel price case), which in turn leads to varying projections for the estimated fleet wide CAFE requirements and GHG CO_2 targets and MPG-e levels projected for MY2025, from 169 g/mi (52.6 mpg-e) under the high fuel price case to 178 g/mi (49.9 mpg-e) under the low fuel price case. These estimated GHG target levels and CAFE requirements reflect changes in the latest projections about the MY2025 fleet mix compared to the projections in 2012 when the agencies first established the standards. Under the footprint-based standards, the program is designed to ensure significant GHG reductions/fuel economy improvements across the fleet, and each automaker's standard automatically adjusts based on the mix (size and volume) of vehicles it produces each model year. In the agencies' current analyses for this Draft TAR, we are applying the same footprint-based standards established in the 2012 final rule to the updated fleet projections for MY2025. It is important to keep in mind that the updated MY2025 fleet wide projections reflected in this Draft TAR are still just projections (as were the fleet projections in the 2012 rule) -- based on the latest available information, which may continue to change with future projections -- and that the actual GHG emissions/fuel economy level achieved in MY2025 won't be determined until the

[2] The projected MY 2025 target of 175 g/mi represents an approximate 50% decrease in GHG emissions relative to the fuel economy standards that were in place in 2010. It is clear from current GHG manufacturer performance data that many automakers are earning air conditioner refrigerant GHG credits that reduce GHG emissions, but do not increase fuel economy. Accordingly, the projected MY 2025 target of 175 g/mi represents slightly less than a doubling of fuel economy relative to the standards that were in place in 2010.

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manufacturers have completed their MY2025 production. The agencies will continue to assess the latest available projections as we continue the Midterm Evaluation process.

Table ES- 1 Projections for MY2025: Car/Truck Mix, CO2 Target Levels, and MPG-equivalent[1]

		AEO 2015 Fuel Price Case		
	2012 Final Rule	AEO Low	AEO Reference	AEO High
Car/truck mix	67/33%	48/52%	52/48%	62/38%
CAFE (mpg)[2]	48.7	45.7	46.3	47.7
CO_2 (g/mi)	163	178	175	169
MPG-e	54.5	50.0	50.8	52.6

Notes:
[1] The CAFE, CO_2 and MPG-e values shown here are 2-cycle compliance values. Projected real-world values are detailed in Chapter 10.1; for example, for the AEO reference fuel price case, real-world EPA CO_2 emissions performance would be 220 g/mi and real-world fuel economy would be 36 mpg.
[2] Average of estimated CAFE requirements.
[3] Mile per gallon equivalent (MPG-e) is the corresponding fleet average fuel economy value if the entire fleet were to meet the CO2 standard compliance level through tailpipe CO2 improvements that also improve fuel economy. This is provided for illustrative purposes only, as we do not expect the GHG standards to be met only with fuel efficiency technology.

The agencies' updated assessments provide projections for the MY2022-2025 standards for several key metrics, including modeled "low-cost pathway" technology penetrations, per-vehicle average costs (cars, trucks, and fleet, by manufacturer and total industry-wide), industry-wide average costs, GHG and oil reductions, consumer payback, consumer fuel savings, and benefits analysis.

Based on the extensive updated assessments provided in this Draft TAR, the projections for the average per-vehicle costs of meeting the MY2025 standards (incremental to the costs already incurred to meet the MY2021 standard) are, for EPA's analysis of the GHG program, $894 - $1,017, and, for NHTSA's analysis of the CAFE program, $1,245 in the primary analysis using Retail Price Equivalent (RPE), and $1,128 in a sensitivity case analysis using Indirect Cost Multipliers (ICM). In the 2012 final rule, the estimated costs for meeting the MY2022-2025 GHG standards (incremental to the costs for meeting the MY2021 standard in MY2021) was $1,070.[3,vii]

[3] This cost estimate from the 2012 final rule was based on the use of Indirect Cost Multipliers (ICMs) in 2010$.

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Table ES- 2 Per-Vehicle Average Costs to Meet MY2025 Standards: Draft TAR Analysis Costs Shown are Incremental to the Costs to Meet the MY2021 Standards

	GHG[1] in MY2025		CAFE in MY 2028	
	Primary Analysis	RPE Sensitivity Case[3]	Primary Analysis[2]	ICM Sensitivity Case[3]
Car	$707	$789	$1,207	$1,156
Truck	$1,099	$1,267	$1,289	$1,096
Combined	$894	$1,017	$1,245	$1,128

Notes:
[1] The values reported for the GHG analysis to account for indirect costs reflect the use of Indirect Cost Multipliers for the primary analysis, and Retail Price Equivalent for the sensitivity case.
[2] The values reported for CAFE primary analysis reflect the use of RPE and include civil penalties estimated to be incurred by some OEMs as provided by EPCA/EISA. Estimated technology costs (without civil penalties) average $1,111, $1,246, and $1,174, respectively for MY2028 passenger cars, light trucks, and the overall light-duty fleet.
[3] Note that Chapter 12 (GHG) and Chapter 13 (CAFE) include a wide range of additional sensitivity cases.

In Table ES-2, NHTSA's estimates are provided for MY2028 because NHTSA's analysis, which is conducted on a year-by-year basis, indicates that manufacturers could make use of EPCA/EISA's provisions allowing credits to be earned and carried forward to be applied toward ensuing model years. Therefore, NHTSA's analysis indicates that a "stabilized" response to the augural standards might not be achieved until approximately 2028 (see Chapter 13 for additional detail). EPA estimates are provided for MY2025 because EPA's analysis projects that each manufacturer would comply in MY2025 with that year's standards (see Chapter 12 for additional details).

Table ES-3 shows fleet-wide penetration rates for a subset of the technologies the agencies' project could be utilized to comply with the MY2025 standards. While all three agencies have been working collaboratively on an array of issues throughout this initial phase of the Midterm Evaluation, much of the EPA GHG and NHTSA CAFE assessments were done largely independently, as reflected in the different technology pathways shown in Table ES-3 (see Chapter 2.3 for additional detail). The agencies' analyses each project that the MY2022-2025 standards can be met largely through improvements in gasoline vehicle technologies, such as improvements in engines, transmissions, light-weighting, aerodynamics, and accessories. The analyses further indicate that only modest amounts of hybridization, and very little full electrification (plug-in hybrid electric vehicles (PHEV) or electric vehicles (EV)) technology will be needed to meet the standards. This initial assessment of potential technology paths is similar to the agencies' projections made in the 2012 final rule, and is consistent with the findings of the National Academy of Sciences report from June 2015 (discussed in Chapter 2).

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Table ES- 3 Selected Technology Penetrations to Meet MY2025 Standards[1]

	GHG	CAFE
Turbocharged and downsized gasoline engines	33%	54%
Higher compression ratio, naturally aspirated gasoline engines	44%	<1%
8 speed and other advanced transmissions[2]	90%	70%
Mass reduction	7%	6%
Stop-start	20%	38%
Mild Hybrid	18%	14%
Full Hybrid	<3%	14%
Plug-in hybrid electric vehicle[3]	<2%	<1%
Electric vehicle[3]	<3%	<2%

Notes:
[1] Percentages shown are absolute rather than incremental. These values reflect both EPA and NHTSA's primary analyses; both agencies present additional sensitivity analyses in Chapter 12 (GHG) and Chapter 13 (CAFE). For EPA this includes a pathway where higher compression ratio naturally aspirated gasoline engines are held at a 10% penetration, and the major changes are turbocharged and downsized gasoline engines increase to 47% and mild hybrids increase to 38% (See Chapter 12.1.2)
[2] Including continuously variable transmissions (CVT)
[3] In EPA's modeling, the California Zero Emission Vehicles (ZEV) program is considered in the reference case fleet; therefore, 3.5% of the fleet is projected to be full EV or PHEV in the 2022-2025 timeframe due to the ZEV program and the adoption of that program by nine additional states.

Although some of the differences in costs are expected as EPA and NHTSA conducted two independent analyses, the consideration of CARB's program also led to one important difference. As noted in the footnote for Table ES-3, EPA's analysis included consideration for compliance with other related state regulations including CARB's ZEV regulation that has also been adopted by nine other states under Section 177 of the Federal Clean Air Act. CARB's ZEV program requires a portion of new light-duty vehicle sales to be ZEVs and collectively, CA and these states represent nearly 30 percent of nationwide sales of light-duty vehicles. CARB worked with EPA to include ZEVs reflecting compliance with California's ZEV program within the reference fleet used by EPA. NHTSA's analysis did not. This accounts for at least part of the cost differences in the two agencies' analyses as well as for some of the difference in technology penetration rates for full hybrids.

EPA's analysis indicates that, compared to the MY2021 standards, the MY2025 standards will result in a net lifetime consumer savings of $1,460 - $1,620 and a payback of about 5 to 5 ½ years.[4] NHTSA's primary analysis indicates that net lifetime consumer savings could average $680 per vehicle, such that increased vehicle purchase costs are paid back within about 6 ½ years, and $800 with payback within about 6 years in a sensitivity case analysis using ICMs.

[4] Based on the AEO 2015 reference case gasoline price projections, 3 percent discount rate, and ICMs.

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Table ES- 4 Payback Period and Lifetime Net Consumer Savings for an Average Vehicle Compared to the MY2021 Standards

	GHG MY2025 Vehicle		CAFE MY2028 Vehicle	
	Primary Analysis	RPE Sensitivity Case	Primary Analysis	ICM Sensitivity Case
Payback period (years)	5	5 ½	6 ½	6
Net Lifetime Consumer Savings ($, discounted at 3%)	$1,620	$1,460	$680	$800

* Note that Chapter 12 (GHG) and Chapter 13 (CAFE) include a wide range of additional sensitivity cases.

Over the lifetimes of MY2021-2025 vehicles, EPA estimates that under the GHG standards, GHG emissions would be reduced by about 540 million metric tons (MMT) and oil consumption would be reduced by 1.2 billion barrels. Over the lifetimes of MY2016-2028 vehicles, NHTSA estimates that under the augural MY2022-2025 CAFE standards, GHG emissions would be reduced by about 748 MMT and oil consumption would be reduced by about 1.6 billion barrels. NHTSA's estimates span a wider range of model years for two reasons, as discussed in Chapter 13: first, the NHTSA analysis projects that manufacturers may take some "early action" prior to MY2022; second, as discussed above, the response to the augural standards might not be "stabilized" until after MY2025. Differences in these values also result from differences in the agencies' estimates of annual mileage accumulation by light-duty vehicles.[5]

Table ES- 5 Cumulative GHG and Oil Reductions for Meeting the MY2022-2025 Standards

Lifetime Reductions	GHG (MYs 2021-2025 vehicles)	CAFE (MYs 2016-2028 vehicles)
CO_2e reduction (million metric tons, MMT)	540	748
Oil reduction (billion barrels)	1.2	1.6

For the EPA GHG analysis, total industry-wide costs of meeting the MY2022-2025 GHG standards are estimated at $34 to $38 billion. Societal monetized benefits of the MY2022-2025 standards (exclusive of fuel savings to consumers) range from $40 to $41 billion. Consumer pre-tax fuel savings are estimated to be $89 billion over the lifetime of vehicles meeting the MY2022-2025 standards. Net benefits (inclusive of fuel savings) are estimated at $90 to $94 billion. These values are all at a 3 percent discount rate; values at a 7 percent discount rate are shown in Table ES-6 below.

[5] The agencies' methods for assessing vehicle mileage accumulation are discussed in Chapter 10.3 for EPA, and Chapter 13 for NHTSA.

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Table ES- 6 GHG Analysis of Lifetime Costs & Benefits to Meet the MY2022-2025 Standards (for Vehicles Produced in MY2021-2025)* (Billions of 2013$)

	3 Percent Discount Rate		7 Percent Discount Rate	
	Primary Analysis	RPE Sensitivity Case	Primary Analysis	RPE Sensitivity Case
Vehicle Program	- $34	-$38	-$24	-$27
Maintenance	-$2	-$2	-$1	-$1
Fuel	$89	$89	$49	$49
Benefits*	$41	$40	$30	$30
Net Benefits	$94	$90	$54	$51

Note:
*These values reflect AEO 2015 reference fuel price case. The Primary Analysis reflects ICMs and the Sensitivity Case reflects RPEs. All values are discounted back to 2015; see Chapter 12.3 for details on discounting social cost of GHG and non-GHG benefits. Note that Chapter 12 also includes a number of additional sensitivity cases.

NHTSA's primary analysis shows that compared to the No Action alternative, the augural CAFE standards could entail additional costs totaling $87 billion during MYs 2016-2028 (reasons for this span of MYs are discussed above), and a sensitivity case using ICM shows total costs of $79 billion. The primary analysis shows benefits totaling $175 billion, and the ICM sensitivity case shows $178 billion. Consumer fuel savings are estimated to be $67 billion to $122 billion over the lifetime of vehicles meeting the MY2022-2025 standards. Thus, net benefits (inclusive of fuel savings) could total $88 billion based on the primary analysis and $99 billion for the ICM sensitivity case. These are estimates of the present value (in 2015) of costs and benefits, based on a 3 percent discount rate. NHTSA has also conducted analysis using a 7 percent discount rate, and a broader sensitivity analysis to examine the impact of other key analysis inputs, as discussed in Chapter 13. Below, Table ES-7 provides an overall summary of costs and benefits observed in NHTSA's analysis.

Table ES- 7 CAFE Analysis of Lifetime Costs & Benefits to Meet the MY2022-2025 Standards (for Vehicles Produced in MY2016-2028) (Billions of 2013$)

	3 Percent Discount Rate		7 Percent Discount Rate
	Primary Analysis[2]	ICM Sensitivity Case[3]	Primary Analysis
Vehicle Program[1]*	-$87	-$79	-$60
Benefits (Fuel)	$120	$122	$67
Benefits (Other)	$55	$56	$43
Net Benefits	$88	$99	$50

Notes:
[1] Includes changes in maintenance costs (small relative to cost of additional technology).
[2] The Primary Analysis reflects RPE.
[3] Note that Chapter 13 includes a wide range of additional sensitivity cases.

As noted above, 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.

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References

[i] See 40 CFR 86.1818-12(h).
[ii] See 40 CFR 86.1818-12(h).
[iii] See 40 CFR section 86.181-12(h).
[iv] See 77 FR 62784 (Oct. 12, 2012).
[v] See 40 CFR 86.1818-12(h)(2)(i).
[vi] National Academy of Sciences, National Research Council to the National Academies, "Cost, Effectiveness and Deployment of Fuel Economy Technologies for Light-Duty Vehicles," June 2015.
[vii] Regulatory Impact Analysis: Final Rulemaking for 2017-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards, EPA-420-R-12-016, Table 5.1-8, page 5-8.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

May 2, 2017

THE ADMINISTRATOR

The Honorable Edmund G. Brown, Jr.
Governor of California
State Capitol, Suite 1173
Sacramento, CA 95814

Dear Governor Brown:

Like you, I want cleaner and more efficient vehicles, but I also want to ensure that we follow the letter of the law and the required regulatory process. I've made a commitment to follow the principles of cooperative federalism underlying environmental statutes and that means ensuring states have a seat at the federal rulemaking table. Many states were not given a voice during the last administration and this dynamic often led to bad public policy and negligible environmental results. I want to change that dynamic to ensure federal regulations are fair and produce meaningful environmental benefits that provide regulatory certainty to the American people. I hope you share this philosophy.

One example of a flawed process that ignored these principles was the Obama Administration's review of vehicle emission and fuel economy standards. I believe it would be a disservice to the American people and the rule of law to embrace the flawed review of the prior administration. As you are aware, in 2012 the U.S. Environmental Protection Agency and the Department of Transportation (DOT) jointly issued greenhouse gas and fuel economy standards for model year 2017-2025 light-duty vehicles that required EPA conduct a Mid-term Evaluation (MTE). Due to the unprecedented and far reaching length of the standards – spanning vehicles manufactured over the course of more than a decade – the MTE was designed to review the underlying assumptions that shaped the 2012 rulemaking and inform whether the standards for MY2022-2025 light-duty vehicles warrant revision. Per the 2012 rulemaking, the formal MTE process included: 1) a draft Technical Assessment Report (TAR), issued by EPA, DOT, and the California Air Resources Board with opportunity for public comment by no later than November 15, 2017; 2) a Proposed Determination or similar step, providing the opportunity for public comments; and 3) a Final Determination by April 1, 2018. Unfortunately, the EPA under the last administration circumvented this process.

In the first instance, the draft TAR was issued on July 27, 2016, more than fifteen months prior to its due date. The TAR was meant to reflect the most up-to-date data, yet the prior administration opted to short-circuit this critical data-gathering step. Due to the rushed nature of this process, concerns have been raised about whether the EPA adequately responded to public comments on the Draft TAR, as well as denying several requests to extend the 60-day comment period.

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Then, without any public notice or meaningful consultation with DOT, the EPA released its proposed determination on November 30, 2016. In addition, the critical Office of Management and Budget (OMB) review period was bypassed for the proposed determination, and the EPA provided a mere 30-day public comment period on the proposed determination, to review hundreds of pages and thousands of modeling outputs underlying the proposal and denied numerous requests for an extension. On January 12, 2017 – nearly a year and a half before it was due – the EPA issued the final determination. Again, the determination did not undergo full DOT or OMB review and the EPA failed to adequately consider the hundreds of thousands of public comments. This effort not only diverged from the required process outlined in the 2012 rule, it also gave short shrift to the American public.

To get the agency back on track with the required regulatory process, on March 15, 2017, DOT Secretary Chao and I announced a collaborative reconsideration of the MTE consistent with the president's directive and the 2012 rulemaking. With your participation, this reconsideration will be based on the best available data and part of a robust, timely and inclusive process. We hope you will work with us to be part of this process.

Sincerely,

E. Scott Pruitt

cc: Mary D. Nichols
Chair, California Air Resources Board