the systems that impact fuel economy such as the oxygen sensor and catalytic converter are already covered by EPA's service information availability rules. However, many changes such as those impacting braking and air conditioning likely are not covered. [OAR-2009-0472-7057.1, p.3]

In addition, tire pressure sensors while required by the National Highway Traffic Administration (NHTSA) for safety reasons, also play an important role in ensuring that vehicles are operating at peak fuel efficiently. As our comments indicated at the outset, an improperly inflated tire can mean a fuel efficiency loss of 3.3 percent. Yet, there is no requirement for car companies to make available to the independent service industry any information necessary to ensure that the tire pressure sensor is working properly after a tire is changed or repaired. [OAR-2009-0472-7057.1, p.3]

If the Agency is planning to revise the definition of emissions to include greenhouse gas emissions, we believe that EPA is also obligated to ensure that the service information rule covers all vehicle systems that impact emissions of greenhouse gases. In developing this rule, EPA must look not only at new technologies that will be utilized on internal combustion engines, but also at hybrid systems where items such as regenerative braking might not have been included under the current service information rule, but are essential to ensuring that the hybrid vehicles operate properly. [OAR-2009-0472-7057.1, p.3]

EPA Response:

Onboard Diagnostic (OBD) Requirements

The light-duty on-board diagnostics (OBD) regulations require manufacturers to detect and identify malfunctions in all monitored emission-related powertrain systems or components.[35] Specifically, the OBD system is required to monitor catalysts, oxygen sensors, engine misfire, evaporative system leaks, and any other emission control systems directly intended to control emissions, such as exhaust gas recirculation (EGR), secondary air, and fuel control systems. The monitoring threshold for all of these systems or components is 1.5 times the applicable standards, which typically include NMHC, CO, NO_X, and PM. EPA did not propose that CO_2 emissions would become one of the applicable standards required to be monitored by the OBD system. EPA did not propose CO_2 become an applicable standard for OBD because it was confident that many of the emission-related systems and components currently monitored would effectively catch any malfunctions related to CO_2 emissions. For example, malfunctions resulting from engine misfire, oxygen sensors, the EGR system, the secondary air system, and the fuel control system would all have an impact on CO_2 emissions. Thus, repairs made to any of these systems or components should also result in an improvement in CO_2 emissions. In addition, EPA did not have data on the feasibility or effectiveness of monitoring various emission systems and components for CO_2 emissions and did not believe that it would be prudent to include CO_2 emissions without such information.

EPA did not address whether N_2O or CH_4 emissions should become applicable standards for OBD monitoring in the proposal. Several manufacturers felt that EPA's silence on this issue

[35] 40 CFR 86.1806-04

implied that EPA was proposing that N_2O and CH_4 emissions become applicable OBD standards. They commented that EPA should not include them as part of OBD. They felt that adding N_2O and CH_4 would significantly increase OBD development burden, without significant benefit, since any malfunctions that increase N_2O and CH_4 would likely be caught by current OBD system designs. EPA agrees with the manufacturer's comments on including N_2O and CH_4 as applicable standards. Therefore, at this time, EPA is not requiring CO_2, N_2O, and CH_4 emissions as one of the applicable standards required for the OBD monitoring threshold. EPA plans to evaluate OBD monitoring technology, with regard to monitoring these GHG emissions-related systems and components, and may choose to propose to include CO_2, N_2O, and CH_4 emissions as part of the OBD requirements in a future regulatory action.

Plug-in Hybrid Useful Life Indicator for the Battery

Honda commented that existing EPA regulations (40 CFR 86.1806-05(b)(8)(ii)) "require plug-in hybrid vehicles (PHEVs) to be equipped with a "useful life indicator for the battery" when the range deteriorates to less than 75 percent of its initial range. On the other hand, in the NPRM, EPA states: "EPA does not plan to require CO_2 emissions as one of the applicable standards required for the OBD monitoring threshold." Honda recommended that "EPA should take this opportunity to clarify its intent with respect to the PHEV useful life indicator."

EPA believes that it is too early in the development of PHEVs to address this issue at this time. We agree to work with the Industry and interested stakeholders (including the California Air Resources Board) to assess the need for this requirement. Should the need for such a device change, regulation changes may be warranted.

Service Information Availability

The GHG rule does not change EPA's service information regulations requiring manufacturers to make available any and all emissions-related information. EPA will continue to monitor the emissions-related service information that manufacturers make available to meet existing regulations. As part of EPA's continuing monitoring, the agency would consider whether any additional service information requirements are necessary as an indirect consequence of the promulgation of GHG standards

5.10.8. Miscellaneous Revisions to Existing Regulations

Organization: Alliance of Automobile Manufacturers (Alliance)

Comment:

Alliance of Automobile Manufacturers (Alliance):

Fuel Economy (FE) Data (Proposed regulations in 40 C.F.R. 600.113-08)

EPA has proposed to calculate FE based on deteriorated emission data. This proposal creates several issues:

• This is a fundamental change to the way FE has been calculated. All prior FE calculations and standards (gas guzzler, CAFE) have been based on emission data that has not been deteriorated.

• FE calculations include the following constituents depending on the type of fuel that is used; total hydrocarbons (HC), carbon monoxide (CO), methane (CH4), non-methane hydrocarbons (NMHC), methanol (CH3OH), formaldehyde (HCHO), ethanol (C2H5OH) and acetaldehyde (C2H4O). While some of these constituents currently have useful life standards and already have deterioration factors, some do not. Therefore, manufacturers may be required to rerun all forms of durability vehicle testing in order to establish DFs for these additional constituents.

• The use of deteriorated emission data contradicts the requirement to downward adjust FE values for test vehicles whose system miles have exceeded 6200 miles.

• This change will require significant changes to existing computer programs that were designed to calculate FE via the traditional method. [OAR-2009-0472-6952.1, pp.49-50]

Recommendation:

Because the current emission durability programs were designed to predict traditional emission deterioration and not the effects that vehicle aging may have on FE, the use of deteriorated emission data in the FE calculation can lead to false and/or inconsistent results based on the manufacturer's choice of durability program. Requiring the use of deteriorated data will penalize those manufacturers who choose to utilize a durability program that develops DFs versus "aged component" testing. When testing with aged components, the only components that are being aged are those that affect the current criteria pollutants. The dynamometer load on the vehicle does not change whether the vehicle is being tested with 4K or 120K aged components; therefore, the amount of fuel consumed during the test, theoretically, will not change. Because the same amount of fuel is being consumed, the increase in HC and CO emissions due to the use of deteriorated emission components is offset by a reduction in the emissions of CO2. So, with aged component testing the FE result will be the same as the result that is achieved on a low mileage test. On the other hand, if a manufacturer utilizes DFs, the HC and CO values will be deteriorated without a corresponding decrease in CO2, thereby penalizing the FE result. [OAR-2009-0472-6952.1, p.50]

Furthermore, EPA is on record stating that there is no reason to believe that CO2 emissions will show an increase as the vehicle ages as would be expected with criteria pollutants. Therefore, requiring manufacturers to measure and report in-use CO2 emissions that can be predicted from measurements made at vehicle certification would add unnecessary burden that offered little or no additional value. [OAR-2009-0472-6952.1, p.50]

In order to avoid these issues, the Alliance recommends that EPA remove the requirement to use deteriorated emission data in the carbon balance equations and retain the current method for calculating FE. [OAR-2009-0472-6952.1, p.50]

EPA Response:

Use of Deterioration Factors in Fuel Economy Calculations

EPA proposed to calculate CREE emissions based on deteriorated emissions data for the manufacturer's end-of-year CREE emission level and also to determine the in-use CREE emission standard which is applicable to each manufacturer's specific models. EPA did not intend to propose to calculate fuel economy based on deteriorated emissions data, however EPA proposed regulations (74 FR 49772, September 28, 2009) suggested otherwise, as follows:

> (g) Calculate separate FTP, highway, US06, SC03 and Cold temperature FTP fuel economy from the grams/mile values for total HC, CO, CO_2 and, where applicable, CH_3OH, C_2H_5OH, C_2H_4O, HCHO, NMHC and CH_4, and the test fuel's specific gravity, carbon weight fraction, net heating value, and additionally for natural gas, the test fuel's composition.
>
> (1) If the emission values (obtained per paragraph (a) through (e) of this section, as applicable) were obtained from testing with aged exhaust emission control components as allowed under 86.1823-01, then these test values shall be used in the calculations of this section.
>
> (2) If the emission values (obtained per paragraph (a) through (e) of this section, as applicable) were not obtained from testing with aged exhaust emission control components as allowed under 86.1823-01, then these test values shall be adjusted by the appropriate deterioration factor determined according to 86.1823-01 before being used in the calculations of this section. [Emphasis added]

The Alliance recommended that "EPA remove the requirement to use deteriorated emission data in the carbon balance equations and retain the current method for calculating FE."

EPA has corrected this oversight in the final rule.

5.10.9. Warranty, Defect Reporting, and Other Emission-related Components Provisions

Organization: Alliance of Automobile Manufacturers (Alliance)
Toyota Motor North America
State of New Jersey
Hyde, James (citizen)

Comment:

Alliance of Automobile Manufacturers:

Warranty Requirements

Emission warranty requirements are not appropriate for mobile air conditioners under the proposed rule, since in-use performance of the MAC system at levels comparable to a new

vehicle is not needed to achieve the emission levels targeted by EPA. [OAR-2009-0472-6952.1, p.28]

Warranty requirements were established for tailpipe pollutants, such as CO and NOx, because emissions of those pollutants would rise significantly if the pollution control devices, such as catalytic converters, fail. This would typically not be the case for MAC components. First, consider the case of indirect emissions from fuel consumed to power the MAC. In the vast majority of MAC failure modes, the system stops cooling and ceases operation -- either because the critical moving parts stop moving or because the system is switched off -- thereby actually reducing the indirect CO2 emissions. [OAR-2009-0472-6952.1, p.28]

Emission warranties should not be required in relation to the indirect MAC emissions. The most significant item in EPA's proposed warranty coverage, the compressor, can cost over $1,000 to replace. It seems paradoxical and disproportionate to impose such high costs in an emissions recall scenario to replace this component, and thereby actually increase indirect emissions. Although manufacturer warranties may typically already be longer than the two-year period proposed by EPA in this NPRM, in principle there is no sound basis for emission warranty coverage to safeguard indirect emission levels, since indirect emissions go down when the system fails. Finally, it is worth noting that proper functioning of these parts is not actually required to achieve the emissions levels set by EPA. [OAR-2009-0472-6952.1, p.28]

Regarding direct emissions of refrigerant, there is only a negligible environmental impact if refrigerants below a GWP of 150 are released from the system, even if the entire charge, typically between 1-2 pounds, is released. Therefore, emission warranty coverage of joints, hoses, seals, etc. is certainly not needed to protect the environmental gains from application of low-GWP refrigerants. While the ultimate costs of the new low-GWP refrigerants are not known with certainty, they are expected to be at a level that would severely discourage motorists from repeatedly recharging a system with significant unrepaired leaks (e.g., any cost of over $30 per pound). Therefore, there is no emission-based reason to mandate warranty coverage to prevent leaks on low-GWP systems, and the potential costs of an emission recall would be disproportionate to any environmental impact of leakage of these refrigerants. [OAR-2009-0472-6952.1, p.28]

Any emission warranty requirements should specifically exclude emission warranty coverage for systems using a refrigerant with a GWP below 150. This is consistent with EPA's position that no emissions warranty is required for zero emissions vehicles. [OAR-2009-0472-6952.1, p.28]

The sole remaining MAC environmental impact would be from refrigerant leakage in the current R-134a systems. Given the prospect for fairly rapid adoption of the low-GWP refrigerants in new vehicles during the time frame of this regulation, this would appear to be a very small basis on which to create an entirely new area of emissions warranty coverage and all the associated elements of an in-use program for air conditioners. EPA should not create a program of warranty coverage for MAC components in pursuit of such a small and temporary emissions impact. [OAR-2009-0472-6952.1, p.28]

Toyota:

Air Conditioning systems and related components have not previously been covered under the CAA emission warranty provisions. In recognition that the proposed A/C related CO2 emission standards are dependent upon the proper functioning of components on the A/C system, EPA proposes that the components of these systems be included under the CAA emission warranty provisions, with a warranty of 2 years / 24,000 miles. [OAR-2009-0472-7291, p.31]

Overall, Toyota believes that emission warranty requirements are not appropriate for mobile air conditioners under the proposed rule. Emission warranty requirements were established for tailpipe pollutants because emissions of those pollutants would rise significantly if the pollution control devices, such as catalytic converters would fail. This is not the case for MAC systems since in-use performance of the MAC system at levels comparable to that of a new vehicle is not needed to achieve the emission levels targeted by EPA. Additionally, Emission warranty for A/C systems is unnecessary because manufacturer warranties typically already are longer than the two-year period proposed by EPA in this NPRM. [OAR-2009-0472-7291, p.31]

With regards to direct emissions resulting from system leakage, there is only a negligible environmental impact if refrigerants below a GWP of 150 are released from the system. Therefore, emission warranty coverage of joints, hoses, seals, etc. would be unnecessary to protect the environmental gains from application of low-GWP refrigerants. Consequently, there would be no emission-based reason to mandate warranty coverage to prevent leaks on low-GWP systems, and the potential costs of an emission recall would be disproportionate. [OAR-2009-0472-7291, p.32]

State of New Jersey:

The Department supports the USEPA proposal to include components on the motor vehicle air conditioning system, such as rings, fittings, compressors, and hoses, under the Clean Air Act's section 207(a) emission warranty provisions. [OAR-2009-0472-7109.1, p.9]

Mr. James Hyde (citizen):

Warrantee Issues: CAA §207 addressed 'compliance of vehicles and engines in actual use'; and includes warranty provisions. Section 207(a) includes warrantee protection for vehicle owners against defects in 'parts, devices, or components designed for emission control. Section 207 (b) includes warrantee protection for vehicle owners against 'any penalty or other sanction' resulting from failing a emissions test due to a §207(a) warranted item. In the Preamble [po 243] EP A states that it is proposing to 'a number of components of the *AlC* system, such as rings, fittings, compressors, and hoses' be included under §207(a). Language to effect this, however, does not appear in the proposed regulatory changes. EPA also requests 'comment as to whether any other parts or components should be designates as 'emission related parts' subject to warranty and defect reporting provisions under this proposal.' [Preamble p. 244] [OAR-2009-0472-7258.1, pp. 3-4]

EPA Response:

Background Information

As outlined in the proposal, Section 207(a)(1) of the Clean Air Act (CAA) requires manufacturers to provide a design/defect warranty that warrants a vehicle is designed to comply with emission standards at the time of sale and will be free from defects that may cause noncompliance over the specified warranty period which is 2 years/24,000 miles (whichever is first) or, for major emission control components, 8 years/ 80,000 miles. The warranty covers parts of the emissions control system. The proposal explained that under the greenhouse gas rule, this coverage would include compliance with the proposed CO_2, CH_4, and N_2O standards. The proposal did not discuss the CAA Section 207(b) performance warranty.

EPA proposed to include air conditioning system components under the CAA section 207(a) emission warranty in cases where manufacturers use air conditioning leakage and efficiency credits to comply with the proposed fleet average CO_2 standards. The warranty period of 2 years/ 24,000 miles would apply. EPA requested comments as to whether any other parts or components should be designated as ''emission related parts'' and thus subject to warranty and defect reporting provisions under this proposal.

The Alliance of Automobile Manufacturers (Alliance), Toyota and the State of New Jersey provided comments. The State of New Jersey supported EPA's proposal to include motor vehicle air conditioning system components under the emission warranty provisions. Both the Alliance and Toyota commented that emission warranty requirements are not appropriate for mobile air conditioners because 1) in-use performance of the air conditioning system at levels comparable to a new vehicle is not needed to achieve the emission levels targeted by EPA and 2) manufacturer general warranties already cover air conditioning systems and are typically longer than the two-year/24,000 mile proposed emissions warranty period.

Regarding direct emissions (refrigerant leakage), the Alliance and Toyota commented that warranty requirements are unnecessary for refrigerants with a global warming potential (GWP) below 150 because the environmental impact is negligible even if refrigerants are released from the system. Regarding indirect emissions (fuel consumed to power the air conditioning system), the Alliance commented that EPA should not require warranty coverage of the air conditioning system because in the vast majority of air conditioning failure modes, the system stops cooling and ceases operation -- either because the critical moving parts stop moving or because the system is switched off -- thereby actually reducing the indirect CO_2 emissions.

EPA received no comments regarding 1) other parts or components which should be designated as ''emission related parts'' subject to warranty requirements, 2) defect reporting requirements, or 3) other requirements associated with warranty and defect reporting requirements (e.g., voluntary emission-related recall reporting requirements, performance warranty requirements, voluntary aftermarket parts certification requirements or tampering requirements.

Defect Warranty

The defect warranty requirements are provided in Section 207 of the Act. There are currently no defect warranty regulations. Congress provided under Section 207(a) of the CAA that emission-related components shall be covered under the 207(a) defect warranty for the warranty period outlined in section 207(i) of the CAA. For example, section 207(a) reads in part:

> "….the manufacturer of each new motor vehicle and new motor vehicle engine shall warrant to the ultimate purchaser and each subsequent purchaser that such vehicle or engine is (A) designed, built and equipped so as to conform at the time of sale with applicable regulations under section 202, and (B) free from defects in materials and workmanship which cause such vehicle or engine to fail to conform with applicable regulations for its useful life (as determined under sec. 202(d)). In the case of vehicles and engines manufactured in the model year 1995 and thereafter such warranty shall require that the vehicle or engine is free from any such defects for the warranty period provided under subsection (i)."

Section 207(i) reads in part:

> "(i) Warranty Period.---
>
> (1) In General.—For purposes of subsection (a)(1) and subsection (b), the warranty period, effective with respect to new light-duty trucks and new light-duty vehicles and engines, manufactured in model year 1995 and thereafter, shall be the first 2 years or 24,000 miles of use (whichever first occurs), except as provided in paragraph (2). For the purposes of subsection (a)(1) and subsection (b), for other vehicles and engines the warranty period shall be the period established by the Administrator by regulation (promulgated prior to the enactment of the Clean Air Act Amendments of 1990) for such purposes unless the Administrator subsequently modifies such regulation.
>
> (2) In the case of a specified major emission control component, the warranty period for new light-duty trucks and new light-duty vehicles manufactured in the model year 1995 and thereafter for purposes of subsection (a)(1) and subsection (b) shall be 8 years or 80,000 miles of use (whichever first occurs). As used in this paragraph, the term 'specified major emission control component' means only a catalytic converter, an electronic emissions control unit, and an onboard emissions diagnostic device, except that the Administrator may designate any other pollution control device or component as a specified major emission control component if---
>
> (A) the device or component was not in general use on vehicles and engines manufactured prior to the model year 1990; and (B) the Administrator determines that the retail cost (exclusive of installation costs) of such device or component exceeds $200 (in 1989 dollars, adjusted for inflation or deflation as calculated by the Administrator at the time of such determination….."

Thus, the CAA provides the basis of the warranty requirements contained in today's final rule, which will cover "emission related parts" necessary to provide compliance with CO_2, CH_4, and N_2O standards. Emission related parts would include those parts, systems, components and software installed for the specific purpose of controlling emissions or those components, systems, or elements of design which must function properly to assure continued vehicle emission compliance, including compliance with CO_2, CH_4, and N_2O standards; (similar to the

current definition of "emission related parts" provided in 40 CFR 85.2102(14) for performance warranty requirements). For example, today's action will extend defect warranty requirements to emission-related components on advanced technology vehicles such as cylinder deactivation components or batteries used in hybrid-electric vehicles.

Under today's rule, EPA will extend the defect warranty requirement to emission-related components necessary to meet CO_2, CH_4, and N_2O standards, including emission-related components which are used to obtain optional credits for 1) certification of advanced technology vehicles, 2) credits for reduction of air conditioning refrigerant leakage, 3) credits for improving air conditioning system efficiency, 4) credits for off-cycle CO_2 reducing technologies, and 5) optional early credits for 2009-2011 model year vehicles outlined in the provisions of 40 CFR 86.1867-12 (which are required to be reported to EPA after the 2011 model year).

Regarding the comments received by the Alliance and Toyota, that warranty coverage is not needed for air conditioning components, EPA believes that the Clean Air Act requires warranty coverage on components used to demonstrate compliance with the emission standards, including components used in the optional credit programs for reduction of air conditioning refrigerant leakage and air conditioning efficiency improvements. EPA does not have the discretion to forgo warranty requirements by regulation in today's final rule. Thus, the Agency is adopting defect warranty requirements for air conditioning components as proposed. At the same time, if a defect in materials or workmanship does not cause an increase in emissions, then there would not appear to be a breach of the warranty.

Effective date of warranty for components used to obtain Early Credits

Regarding the defect warranty for emission-related components used to obtain optional early credits for 2009-2011 vehicles, the defect warranty should provide coverage for these components at the time the early credits report is submitted to EPA (e.g., no later than 90 days after the end of the 2011 model year). For example, the defect warranty for early credit components does not have to apply retroactively (before the manufacturer declares the credits to EPA). The Agency believes this approach is reasonable, because 1) manufacturer's early credit plans may not be finalized until after vehicles have been produced; 2) manufacturers will be provided satisfactory lead time to provide warranty requirements to customers; and 3) the manufacturer's basic (bumper-to-bumper) warranty for air conditioning and other early credit components are typically longer than the two-year/24,000 mile proposed warranty period which will be applicable to most early credit components.).

Performance Warranty

EPA did not propose any changes to the current performance warranty requirements, because the performance warranty preconditions outlined in section 207(b) of the CAA have not been satisfied. For example, section 207(b) of the CAA comes into play if EPA issues performance warranty short test regulations and determines that there are inspection facilities available in the field to determine when vehicles do not comply with greenhouse gas emission standards. Once EPA issues performance warranty short test regulations, then the CAA performance warranty provisions require the manufacturer to pay for emission-related repairs if a vehicle is properly

maintained and used, and fails the short test and is required to repair the vehicle. Currently the provisions of 85.2207 and 85.2222 provide performance warranty short test (commonly called an inspection and maintenance or I/M test). The provisions of 85.2207 and 85.2222 provide an I/M test procedure and failure criteria based on an inspection of the onboard diagnostic (OBD) system of the vehicle. The OBD inspection procedure in 85.2222 is currently used in most areas of the country where I/M tests are required. For example, a vehicle fails the OBD test procedure outlined in 85.2222 if the vehicle's MIL is commanded to be "on" during the I/M test procedure.

Although most areas of the country which require I/M testing use the OBD test procedures outlined in 40 CFR 85.2207 and 85.2222, the NPRM did not propose that the OBD system would be required to monitor CO_2, CH_4 or N_2O emission performance, ref. 74 FR 49574 and 74 FR 49755. Therefore, the performance warranty preconditions in section 201(b) of the CAA are not currently in effect for greenhouse gas CO_2 emissions. The performance warranty continues to apply for criteria pollutants but does not apply for greenhouse emissions.

Defect Reporting and Voluntary Emission-related Recall Reporting Requirements

EPA did not propose any changes to the current defect reporting and voluntary emission-related recall reporting requirements outlined in the provisions of 40 CFR 85.1901-1909. Although EPA requested comments, we did not receive any comments on defect reporting and voluntary emission-related recall reporting requirements. Current regulations require manufacturers to submit a defect report to EPA whenever an emission-related defect exists in 25 or more in-use vehicles or engines of the same model year. The defect report is required to be submitted to EPA within 15 working days of the time the manufacturer become aware of that a defect affects 25 or more vehicles. Current regulations require manufacturers to submit to EPA voluntary emission-related recall reports within 15 working days of the date when owner notification begins.

Similar to the design/defect warranty requirements outlined above, the Agency believes that as proposed, defect reporting and voluntary emission-related recall reporting requirements would apply to emission-related components necessary to meet CO_2, CH_4, and N_2O standards for the useful life of the vehicle, including emission-related components which are used to obtain optional credits for 1) certification of advanced technology vehicles, 2) credits for reduction of air conditioning refrigerant leakage, 3) credits for improving air conditioning system efficiency, and 4) credits for off-cycle CO_2 reducing technologies, and 5) optional early credits for 2009-2011 model year vehicles outlined in the provisions of 40 CFR 86.1867-12 (which are required to be reported to EPA after the 2011 model year). For early credit components, defect reporting requirements and voluntary emission-related recall reporting requirements become effective at the time the early credits report is submitted to EPA (e.g., no later than 90 days after the end of the 2011 model year).

The final rule includes a minor clarification to the provisions of 40 CFR 85.1902 (b) and (d) to clarify that beginning with the 2012 model year, manufacturers are required to report emission-related defects and voluntary emission recalls to EPA, including emission-related defects and voluntary emission recalls related to greenhouse gas emissions (CH_4, N_2O and CO2).

5.10.10. Light Vehicles and Fuel Economy Labeling

Organization: General Motors
Ford Motor Company
Honda Motor Company
Association of International Automobile Manufacturers (AIAM)
Alliance of Automobile Manufacturers (Alliance)
Toyota Motor North America
Natural Resources Defense Council
International Council on Clean Transportation
National Automobile Dealers Association (NADA)
State of New Jersey
New York State Department of Environmental Conservation
Automotive Aftermarket Industry Association (AAIA); et.al
Fisker Automotive, Inc.
Chew, Yuli

Comments:

General Motors:

GM supports the use of individual fleet utility factors (per SAE J1711 draft procedures) for calculating the fuel economy label for advanced technology vehicles. In addition, GM supports inclusion of metric(s) on the Monroney label that are easily understandable and meaningful to the average consumer. In this regard, GM recently shared consumer clinic research with EPA staff that included the feedback on such consumption metrics as "gallons/100 miles" and "$/100 miles". The use of accurate metrics is imperative -- thus a metric like "mpge" where electricity is converted into an equivalent amount of gasoline, could lead to false expectations. We look forward to further discussion and plan detailed comments through the separate labeling rulemaking when it is proposed in the near future. [OAR-2009-0472-6953.1, p.30]

Ford Motor Company:

Advanced Technology Fuel Economy Labeling

Ford supports the development of new, fair, and consistent fuel economy labels for advanced technology vehicles, particularly for plug-in hybrids and electric vehicles. NHTSA requested comments on appropriate metrics for presenting fuel economy-related information on labels and whether a CO2e grams per mile metric should be considered to facilitate comparisons between conventional vehicles and alternative fuel vehicles. The fundamental purpose of these labels is to provide consumers a mechanism to compare the efficiency of vehicles and powertrains on a consistent basis that is understandable. There are many open issues to resolve in the process of developing a consumer-accepted label. Fuel consumption versus fuel economy has been studied through consumer focus groups at Ford and current indications are consumers are not ready or willing to consider fuel consumption as a metric at this time. However, the focus group results indicate that there is a significant value to providing energy information (both petroleum fuel and electrical energy) as separate metrics over standard operating conditions (energy consumed over a fixed distance, e.g., energy per mile, energy per 100 miles) because such metrics are linear.

Total cost to the consumer for both electrical and fuel energy on an annual basis, with standard mileage assumptions, and energy costs is also appropriate. For electric vehicles and plug-in hybrids, we support inclusion of the time and amount of kilowatt hours needed to recharge the battery system to a full state, based on standard household circuit systems (11 Ov/15amp). Options should be provided to include shorter charging times if the vehicle provides the capability.

Ford does not believe that EPA and NHTSA are constrained in providing customers the most informative labels because 'mpg information is currently required by law,' 49 USC § 32908(b)(1) mandates that 'a manufacturer of automobiles shall attach a label. .. containing ... '(A) the fuel economy of the automobile.' According to 49 USC § 32901, 'fuel economy' means the average number of miles traveled by an automobile for each gallon of gasoline (or equivalent amount of other fuel used, as determined by the Administrator under section 32904 (c) of this title' (emphasis added). 'Fuel' is defined in that same section as 'gasoline,' 'diesel oil,' or 'other liquid or gaseous fuel.' The definition of 'fuel' does not include electricity. 'Electricity' is, however, otherwise specifically included as one of the energy sources listed in the definition of an 'alternative fuel.' 49 U.S.C. § 32901 (a)(1)(J).

Therefore, a manufacturer must provide a label containing the fuel economy value for the vehicle, expressed as miles driven per gallon of 'fuel,' meaning per gallon of gasoline or an equivalent amount of diesel or other liquid or gaseous fuel. 49 U.S.C. 32901 (a)(1 0). Since electricity is not a 'fuel' but rather an alternative fuel, no energy efficiency rating is required for electricity under § 32908(b)(1)(A). Further, special energy efficiency labeling and information requirements apply for 'dedicated automobiles' and 'dual fuel automobiles' under § 32908(b)(3); however, even in these cases there is no mandate for an equivalent petroleum-based fuel economy (MPGe) metric. Hence, no specific statutory labeling requirement is driving the need for a MPGe value.

At the same time, the Administrator has authority to 'require or authorize' labeling of 'other information' 'related to the information required by clauses [32908(b)(1)](A)-(D) of this paragraph.' 49 U.S.C. § 32908(b)(1)(F). Therefore, EPA could implement either an electric consumption or electric economy metric.

Thus, Ford does not support the use of MPGe to describe the energy use of an electrically powered automobile or a plug-in hybrid electric vehicle and disagrees that EPCA, mandates a gasoline-equivalent MPGe fuel economy label value. In real-world application, MPGe does not translate into a metric that is understood by most consumers and therefore may be misleading by FTC standards and counterproductive to the acceptance of EV and PHEV technology.

If EPA nevertheless decides to pursue labeling that includes MPGe values, we suggest that EPA develop a plan to eventually sunset the MPGe value altogether. An example of an effective approach can be found in the 2007-2008 transition from 2-cycle to 5-cycle fuel economy values wherein labels contained both new and old values during a transition period, giving greater prominence to the new value. In this situation, we recommend that MPGe be shown in smaller print, as a reference point for the new metrics. Then, as the new metrics become accepted EPA

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should plan to remove MPGe altogether. We expect that this transition of consumer acceptance will be quick given the limitations of MPGe to describe the performance of electric vehicles.

PHEVs present significant fuel economy labeling challenges because of their bimodal fuel economy nature. In other words, consumers are likely to experience very different fuel and electrical economy depending on how far they drive their vehicle before recharging and under given driving conditions. In addition, PHEV fuel consumption will likely change significantly once the electrical battery system has been depleted. Thus, at a minimum the electrical economy and the fuel economy of the vehicle should be included under its optimal driving state, typically referred to in standardized tests as charge depleting mode; and when the battery system has been depleted, typically referred in standardized tests as charge sustaining mode. PHEV label formats will be more complex by nature. This complexity can be described in three basic categories and labels can be modularly formatted to address three types: electric only, hybrid electric-fuel, and fuel only.

EVs will also present challenges because of their range and efficiency sensitivity to driving styles and climate conditions. Current range testing procedures used by CARB and EPA are in need of revision because they are conducted until the vehicle cannot operate properly, Le., until the vehicle can no longer maintain the driving schedule. Such an extreme end condition is not representative of actual vehicle usage because customers will not typically drive until '0' energy remains in the battery system nor until the vehicle can no longer function properly. More typically, vehicles will be driven to a fraction of the full range and recharged, and therefore a more reasonable and representative process is in order. Ford is willing to work with the agencies and industry to update and harmonize these procedures.

In the context of standardized testing, the effects of cold temperature (20F) and heater use are currently being studied by industry as a primary sensitivity factor in an electric vehicles energy efficiency performance, followed by NC load. A hot test temperature (95F) is not expected to have significant effect on battery system and vehicle performance.

In the coming years of EV use, consumer information and performance data needs to be captured, perhaps from early manufacturer and government fleet use, to help in determining appropriate label content for these vehicles. Work is underway within SAE to study these sensitivities and develop standard vehicle testing practices. Ford supports this work and encourages the EPA and other agencies to participate in studies as well help harmonize the potential requirements.

In addition, prior to the final label proposals, we recommend EPA work jointly with PHEV and EV manufacturers to test draft label concepts through focus groups and verify consumer preferences.

Utility Factors

For CAFE purposes, Ford supports a standardized fleet utility factor, one based on SAE J2841. EPA requested comment on how the utility factor is calculated and which data should be used to establish it. The fleet utility factor approach is reasonable when applied to a CAFE requirement,

since it represents a fleet-average driving approach. However, individual customers will see large variations in the performance of their vehicle's efficiency based on how much time they are in either charge-depleting or charge-sustaining mode. This could lead to customer dissatisfaction with a utility-factor derived label, as customers have no way of applying it to their own personal driving patterns. Due to these reasons, it is important to highlight the bimodal nature of PHEVs by showing charge-depleting information separate from charge sustaining on the label and not to focus on one type of average label value at this time.

For CAFE purposes, Ford supports a standardized utility factor, one based on SAE J2841. The agreed-upon utility factor should be limited in with respect to update frequency in order to provide adequate stability and lead time to facilitate cycle planning for manufacturers. For example, utility factors should be published by the EPA for applicable model years at least 1 to 2 model years in advance. Any further updates to the utility factor curves should be made only in future model years, not retro-active to current or previous model years. Since the fleet utility factor represents a national driving distribution, it should be relatively slow to change (barring any significant technology, energy, or infrastructure cost). Frequent updates to the utility factor will not be necessary. [OAR-2009-0472-7082.1, pp. 20-23]

Honda Motor Company:

Generally, Honda proposes that EPA and NHTSA apply the same procedures and logic as SAE standards and CARB regulations to avoid discrepancies. Also, Honda understands that EPA and NHTSA need to define some areas where SAE and ARB are silent – primarily Label issues, CAFE issues and GHG issues. [NHTSA-2009-0059-0095.1, p.12]

Utility Factor Weighting Methods

Honda proposes that Fleet Utility Factors in existing SAE J2841 should be used to combine Charge-Depleting and Charge-Sustaining modes for GHG and CAFE purposes. On the other hand, Honda also proposes that Individual Utility Factor in the upcoming SAE J2841 revision should be used to combine Charge-Depleting and Charge-Sustaining modes for Fuel Economy Labeling purposes. [NHTSA-2009-0059-0095.1, p.12]

The PHEV FE_{MPG} Formula Clarification

The PHEV FE_{MPG} formula in the preamble needs to be revised to more accurately describe the fuel economy from Charge Depleting and Charge Sustaining modes. We propose substituting FE_{CDi} for FE_i. Similarly, it is also clear that $FE_{gasoline}$ denotes the fuel economy during the Charge Sustaining mode, and hence FE_{CS} will clearly describe this to prevent potential confusion on gasoline consumption between Charge Depleting (in a blended PHEV) and Charge Sustaining modes. We propose substituting FE_{CS} for $FE_{gasoline}$. [NHTSA-2009-0059-0095.1, p.13]

Association of International Automobile Manufacturers (AIAM)

The proposed regulations seek comment on the potential use of metrics other than miles per gallon in consumer information regarding fuel efficiency. *See* preamble at 49576. Consumers

perceive in-use fuel economy performance, measured in "miles per gallon," to vary greatly for higher efficiency vehicles, although the actual variation in fuel consumption is not as significant. This perception issue can result in customer dissatisfaction. In addition, consumers need more significant and appropriate information for new technologies, such as plug-in hybrid (PHEV) and battery electric vehicles. In particular, PHEV fuel economy performance varies greatly depending on how the vehicle is used, potentially leading to customer misunderstanding. Therefore, a new consumer information label concept should be developed. AIAM would be pleased to work with EPA and NHTSA to develop consumer information requirements that include all appropriate information, are consumer friendly, and address greenhouse gas emissions as well as fuel efficiency matters. [OAR-2009-0472-7123.1, pp.18-19]

Alliance of Automobile Manufacturers (Alliance):

Fuel Economy Labeling of Advanced Technology Vehicles

Based on manufacturers' announcements, advanced technology vehicles such as plug-in electric hybrid vehicles and electric vehicles will be on the market very soon. Public acceptance and understanding is key to the success of these new technologies. It is imperative that manufacturers and EPA work together to appropriately promote the benefits that these vehicles can provide. To that end, the Alliance fully supports the agencies goals that for these advanced technology vehicles the "labels reflect sound science, treat technologies equitably and provide appropriate information to consumers." [OAR-2009-0472-6952.1, p.53]

To this end, the Alliance and its member companies have been working for over a year with EPA and the Society of Automotive Engineers to develop test procedures, calculation methodologies, metrics and formats. We are committed to continuing to work with the agency to produce the necessary frameworks for these various vehicles. [OAR-2009-0472-6952.1, p.53]

In this GHG/CAFE proposal, EPA seeks comments on issues surrounding consumer vehicle labeling in general, and labeling of advanced technology vehicles in particular. EPA further states that it will "initiate a separate rulemaking to explore in detail the information displayed on the fuel economy label and the methodology for deriving that information." [OAR-2009-0472-6952.1, p.53]

The Alliance supports the use of utility factors in creating the approach for calculating the label for these advanced technology vehicles (specifically individual fleet utility factors for the label per the recent SAE J1711 draft procedures). Further, the Alliance supports a metric on the Monroney label that is simple and understandable to the consumer. An esoteric metric that consumers have very little frame of reference for understanding will only slow – and may even harm -- the acceptance of advanced technologies. [OAR-2009-0472-6952.1, p.54]

Recommendation:

Unfortunately, this separate label rulemaking will not be complete before many products are ready for the market place. Important in this interim period will be the case-by-case approach that EPA will need to undertake to determine the label values for various vehicles. In this

process, EPA must be cognizant of maintaining a level playing field for all advanced technologies as well as providing consumers a way to compare to current conventional vehicles. [OAR-2009-0472-6952.1, p.54]

Toyota Motor North America:

Although EPA intends to initiate a separate rulemaking to explore in detail the information displayed on the fuel economy label of advanced technology vehicles, and the methodology to be used for deriving the information, EPA requests comment on these issues as part of the subject proposal. [OAR-2009-0472-7291, p.33]

With the increasing numbers of advanced technology vehicles beginning to be sold, Toyota supports EPA's continued efforts to address potential issues associated with these technologies, including how best to provide relevant consumer information about their environmental impact, energy consumption, and cost. Toyota believes that providing accurate information is necessary to promote customer acceptance and satisfaction of these advanced technology vehicles. Toyota is concerned that unrealistic or difficult to understand ratings could set up unrealistic expectations that could sour the market introduction of these advanced technology vehicles. [OAR-2009-0472-7291, pp.33-34]

One way to encourage consumers to take a more proactive approach to reducing greenhouse gases and oil consumption is to provide clear information about consumption, rather than efficiency, as part of EPA's new labeling rule initiative. For liquid fueled vehicles, the fuel consumption metric would communicate to the consumer a direct measure of the amount of fuel/energy used and thus directly relates to costs that consumers incur when filling up. Toyota recognizes EPA's previous reluctance to change to a more accurate fuel consumption metric because of the consumer's unfamiliarity with such a metric. However, the current MPG measure continues to be misleading and a fuel consumption metric could be more meaningful to consumers, once the consumers have been familiarized with the different metric. To help educate the consumer, Toyota proposes that EPA consider using both for the short term either on the website or in the fuel economy guide. [OAR-2009-0472-7291, p.34]

Another approach would provide more detailed information on the label specific to operation on gasoline and to operation on electricity. As an example, a hybrid vehicle label would contain gasoline consumption, the plug-in hybrid vehicle label would contain both gasoline consumption and energy consumption (miles per kilowatt-hour), and the electric vehicle would only show electricity consumption. To avoid confusion to the customer, the electric and fuel consumption values could be displayed separately. [OAR-2009-0472-7291, p.34]

Toyota supports the concept of using a utility factor approach as an appropriate methodology to predict/account for the total distance driven in each of the two PHEV modes (i .e. charge depleting and charge sustaining) and calculate fuel economy, including the use of 'fleet' utility factors as currently specified in the most recent SAE J2841 procedure/document . We plan to continue working with EPA and the Society of Automotive Engineers on these test procedures, calculation methodologies, metrics and format issues as one possible approach. [OAR-2009-0472-7291, p.34]

Toyota is currently evaluating all these options. Regardless of the approach ultimately taken by EPA, the label should balance the need for information specific to a given technology with the need for information that can be compared against other vehicles in the marketplace, and at the same time can be understood by consumers. [OAR-2009-0472-7291, p.34]

Natural Resources Defense Council:

Vehicle Labels Should Emphasize GHG Emissions Performance, Fuel Consumption and Operational Costs to Enable Easy Comparisons across Vehicle Classes and Technologies: EPA should update, through a public process, the environmental performance and fuel economy labels on new vehicles. Changes to the labels and associated calculation methodologies should also be reflected in other public education and consumer purchase guides such as the EPA Green Vehicle Guide (www.epa.gov/greenvehicles) and the EPA/DOE Fuel Economy Guide (www.fueleconomy.gov). In the NPRM, EPA states that it "plans to seek comment and engage in extensive public debate about fuel consumption and other appropriate consumer information metrics as part of a new labeling rule initiative." NRDC supports such an initiative and urges EPA to act expeditiously to complete the process in advance of MY 2012. [OAR-2009-0472-7141.1, p. 21]

The scope of today's new vehicle labels should be expanded to include GHG emissions. Consumer awareness of global warming pollution and its implications for climate change have grown dramatically in recent years and the GHG emissions should be displayed prominently on the vehicle in terms of GHG emissions per mile of real-world driving. Since EPA plans to continue to use the 2-cycle FTP for vehicle compliance measurements for MY 2012-2016, the EPA label value should be the compliance value adjusted to reflect typical driving conditions (so-called "5-cycle test"), as is currently done for fuel economy labeling. [OAR-2009-0472-7141.1, p. 21] [See OAR-2009-0472-7141.1, pp. 21-23 for further discussion of this issue.]

In sum, NRDC believes a trio of metrics including GHG emissions (in gCO2 per mile), fuel consumption (in gallons or kWh per 100 miles) and costs (in $ per mile or $ per year) should be displayed with prominence on new vehicle labels. [OAR-2009-0472-7141.1, p. 23]

International Council on Clean Transportation:

The agencies asked for comments on how to present efficiency information for electric vehicles. The current metric, miles per gallon (mpg), does not apply to electricity use for battery-electric vehicles and plug-in vehicles. Thus, the electricity use must be converted into an equivalent number of gallons or a different metric must be used.

ICCT believes this is an opportunity to start supplementing the use of mpg with a better metric. Not only does mpg not work for electricity consumption, but it is also not appropriate for conventional vehicles as it is a non-linear metric. The linear metric is gallons per mile. MPG is the inverse and distorts the relationship between the rating and the amount of fuel used. The higher the mpg rating, the greater the distortion.

Any linear metric would work better, such as gallons per 100 miles, liters per 100 km, BTU (or kWh) per mile, grams CO2 per mile, or $ per mile. The latter three suggestions would also solve the problem with comparing electricity use to gasoline use. Grams CO2 per mile has the additional benefit of treating vehicles and fuels together on a consistent basis.

Canada's experience could provide a valuable guide in how to change the labeling system. Canada added liters per 100 km to their fuel consumption guide, in addition to mpg, many years ago. Such a dual labeling system would be an excellent way to supplement the use of mpg with a better metric and would allow electric vehicles to be compared using the alternative metric. [OAR-2009-0472-7156.1, p.14]

[ICCT also submitted these comments as testimony at the Detroit public hearing, See docket number EPA-HQ-OAR-2009-0472-6185, pp. 62-63.]

National Automobile Dealers Association (NADA):

Dealers have significant point-of-sale purchasing decision expertise and NADA often has provided suggestions on appropriate strategies and language for fuel economy and other vehicle labels. The National Program should clarify that prospective changes to the existing, Monroney based fuel economy label will be made pursuant to a separate well thought out rulemaking. Note that the motoring public only recently became accustomed to extensive changes to the fuel economy label and its values, and to extensive changes to NHTSA's safety label. With NHTSA soon to begin implementing further changes to its safety label, prospective changes to the fuel economy label should be carefully coordinated so as to avoid undue confusion for consumers. [OAR-2009-0472-7182.1, p. 8]

State of New Jersey:

The Department supports the Agencies' efforts to supply additional information to the consumer regarding environmental impacts, energy consumption, cost, range per charge, time to charge, etc. so that consumer can make informed decision before purchasing a vehicle. The label should include a numerical rating and graph-type comparison for each vehicle's environmental impact in relation to other vehicles in the same class and include ratings for both criteria pollutants. [OAR-2009-0472-7109.1, p.9]

Automotive Aftermarket Industry Association (AAIA); et.al:

The aftermarket also strongly urges the agency to include a public education component not only for car owners to make good choices on vehicles, but also to provide information so that once they own these vehicles that they can maintain them. The aftermarket groups listed below would be more than willing to work with the agency to develop such an education program. In fact, much of this information is already on our Be Car Care Aware site www.carcare.org which is widely accessed by car owners. [OAR-2009-0472-7057.1, p.4]

New York State Department of Environmental Conservation:

CAFE and Greenhouse Gas Emission Labels
Much of what is currently included on a vehicle's fuel economy label is mandated by statute. We believe that replacing 'miles per gallon' with a metric similar to Europe's liters per 100 kilometers (or gallons per 100 miles) would be desirable in the long run; but it may require statutory changes. [OAR-2009-0472-7454, p.6]

Specifically for greenhouse gas emissions labeling, we recommend that the following should be supplied in grams per mile:
- The standard the vehicle -is certified to (for example is an all-wheel-drive sedan a passenger car or light truck?),
- The footprint based target emissions rate for the vehicle,
- The actual measured emissions rate for the vehicle,
- The greenhouse gas emission rates used in manufacturers' compliance reporting,
- Any credits (air conditioning, alternative fuel, FFV, etc) applicable to the vehicle. [OAR-2009-0472-7454, p.6]

The CAFE rating, in miles per gallon, used in. manufacturers' compliance reporting should also be presented on the label. [OAR-2009-0472-7454, p.6]

Fisker Automotive, Inc.:

Fisker Automotive recommends a technology-neutral fuel economy label, as shown below. We also propose an interim label solution for ease of transition. See the attached presentation, Fuel Economy Labeling, 2011 & Beyond for more. [OAR-2009-0472-8732.1, p.6] [[See Docket Number OAR-2009-0472-8732.1, pp.8-41 for the attached presentation]]

Yuli Chew (private citizen):

I support EPA's efforts to supply additional information to the consumer about their environmental impact, energy consumption, cost, range per charge, time to charge, etc. so that consumer can make informed decision before purchasing a vehicle. Hopefully, this can build on CARB's Environmental Performance Label Regulation. [OAR-2009-0472-7042.1, p.5]

EPA Response:

EPA received considerable public input in response to the request for comment in the proposal. Since the greenhouse gas rule was proposed in September, 2009, EPA has initiated a separate rulemaking to explore in detail the information displayed on the fuel economy label and the methodology for deriving that information. The purpose of the vehicle labeling rulemaking is to ensure that American consumers continue to have the most accurate, meaningful, and useful information available to them when purchasing new vehicles, and that the information is presented to them in clear and understandable terms.

EPA will consider all vehicle labeling comments received in response to the greenhouse gas proposal in its development of the new labeling rule in coming months. We encourage the

interested public to stay engaged and continue to provide input on this issue in the context of the vehicle labeling rulemaking.

5.11. EPA Estimates of GHG Emissions Reductions and Their Associated Effects

5.11.1 Impact on GHG Emissions

No substantive comments were received concerning the methodology used for calculating the greenhouse gas impacts of the program.

5.11.2 Climate Change Impacts from GHG Emissions

Organization: Environment New Jersey

Comment:

A commenter indicates light-duty vehicles account for about 40 percent of all U.S. oil consumption and when taken with the impacts of global warming which Steve Flint of the Mobile Sources and Fuels Committee of the National Association of Clean Air Agencies (NACAA)] mentioned, and the groundbreaking study from the IPCC in 2007, it's important to emphasize that not only is the science on effects of climate change becoming more dire, but implications for this country over the course of the next few decades and ultimately leading into the later part of the next century if we do not take action, or if we remain on the status quo. [EPA-HQ-OAR-2009-0472-4621, p.71]

The commenter indicates there is a lot of reason to be optimistic because of the solutions that are happening right now in this country. The commenter indicates the actions in the U.S. Congress with the U.S. House and now the U.S. Senate on the American Clean Energy and Security Act really are moving us forward, talking about clean energy solutions, finally putting a cap on global warming pollution, that is where the rest of the world has been moving to, it is where America must move to. [EPA-HQ-OAR-2009-0472-4621, p.74]

EPA Response:

EPA agrees with the commenter's assertion that this action is an important step towards curbing steady growth of GHG emissions from cars and light trucks. In the absence of control, GHG emissions worldwide and in the U.S. are projected to continue to grow. As provided in Section III.F.1 of the preamble to the final rule, U.S. GHGs are estimated to make up roughly 17 percent of total worldwide emissions in 2010, and the contribution of direct emissions from cars and light-trucks to this U.S. share is growing over time, reaching an estimated 19 percent of U.S. emissions by 2030 in the absence of control. This steady rise in GHG emissions is associated with numerous adverse impacts on human health, food and agriculture, air quality, and water and forestry resources.

Policy options for reducing GHGs (e.g., cap and trade) are not within the scope of this rulemaking nor does EPA propose any reduction strategies other than those associated with this rule pursuant to Section 202(a) of the Clean Air Act.
Organization: New York State Department of Environmental Conservation

Comment:

A commenter indicates that New York State hospitalization and mortality rates due to respiratory illnesses currently exceed the national average and this will only get worse as the planet continues to warm. The comment further notes New York's agricultural industry is likely to be affected by shorter growing systems for cold weather crops and eventually a different crop mix and thus affect New York's tourism and maple syrup industries. The commenter notes global warming also poses a significant threat to critical water sources in New York and the combination of higher temperatures and more erratic landfill will lower water levels and will adversely affect drinking water supplies, power generation, commerce, and recreational activities. New York State hospitalization and mortality rates due to respiratory illnesses currently exceed the national average and this will only get worse as the planet continues to warm. [These comments were submitted as testimony at the New York public hearing. EPA-HQ-OAR-2009-0472-4621, pp. 12-13]

EPA Response:

EPA finds the comments provided on impacts to human health and public welfare are generally consistent with those provided in preamble Section III.F.2, Climate Change Impacts from GHGs, to this final rule. Section III.F.2 discusses the projected impacts associated with climate change and warming temperatures as synthesized from the major scientific assessment reports. As indicated in Section III.F.2, "Increases in regional ozone pollution relative to ozone levels without climate change are expected due to higher temperatures and weaker circulation in the United States and other world cities relative to air quality levels without climate change. Climate change is expected to increase regional ozone pollution, with associated risks in respiratory illnesses and premature death. In addition to human health effects, tropospheric ozone has significant adverse effects on crop yields, pasture and forest growth, and species composition. The directional effect of climate change on ambient particulate matter levels remains uncertain."

Please see preamble Section III.F.2 of the rule for a synthesis of key findings regarding observed and projected changes in GHG emissions and associated climate change impacts. The key findings synthesized in Section III.F.2 are primarily drawn from the major scientific assessment reports of the Intergovernmental Panel on Climate Change (IPCC), the U.S. Climate Change Science Program (CCSP), the U.S. Global Change Research Program (USGCRP), and the National Research Council (NRC).
Organization: State of New Jersey

Comment:

A commenter indicates that as we are well aware, there is broad scientific consensus that human-caused greenhouse gas emissions are impacting the earth's climate, and that increasing

atmospheric concentrations of greenhouse gases will result in a very significant adverse global, regional and local environmental impacts. The commenter notes the northeastern states are particularly vulnerable to the impacts of climate change with potentially devastating ecological, economic and public health impacts to New Jersey. The commenter states "Not only does climate change threaten New Jersey's shoreline and ecology, but the socioeconomic impacts of climate change stand to be profound and costly." The commenter asserts that because of New Jersey's unique diverse terrain, nearly all of the impacts of climate change, such as rising temperature in our urban areas, sea level rise jeopardizing our coastal ecosystems and threats to our unique agricultural industries will be experienced throughout the state. The commenter asserts it is critical that the world, the nation, the region and New Jersey take immediate and aggressive action to stabilize and then reduce atmospheric greenhouse gas concentrations in order to avoid the most catastrophic impacts of climate change. The commenter states, "The successful reduction of ozone depleting substances throughout the nation and the world demonstrates that it can be done." [These comments were submitted as testimony at the New York public hearing. See docket number EPA-HQ-OAR-2009-0472-4621]

EPA Response:

EPA agrees with the commenter's assertion that there is broad scientific consensus that human-caused GHG emissions are impacting the Earth's climate. In addition, EPA notes the comments regarding climate change impacts to the Northeast are generally consistent with those provided in Section III.F.2 of the preamble to this final rule. Section III.F.2 provides a summary of observed and projected changes in GHG emissions and associated climate change impacts based on the key findings of Technical Support Document (TSD)[36] for EPA's Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) the Clean Air Act.[37] The key findings synthesized here and the information throughout the TSD source document are primarily drawn from the broad scientific community in the form of assessment reports of the Intergovernmental Panel on Climate Change (IPCC), the U.S. Climate Change Science Program (CCSP), the U.S. Global Change Research Program (USGCRP), and the National Research Council (NRC).

In particular, the USGCRP provides present and future impacts of climate change on the different regions of the United States in a recent national assessment report entitled *Global Climate Change Impacts in the United States*.[38] This report is a key source document for the TSD associated with EPA's Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act and is referenced in Section III.F.2 of the preamble to this rule. In regard to the Northeast Karl et al (2009) reports: "The densely populated coasts of the Northeast are particularly vulnerable to sea level rise, which is projected to rise more than the global average and increase the frequency and severity of damaging storm surges, coastal flooding, and related impacts like erosion, property damage, and loss of wetlands.

[36] "Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act" Docket: EPA-HQ-OAR-2009-0472-11292
[37] See 74 FR 66496 (Dec. 15, 2009)
[38] Karl, T., J. Melillo, and T. Peterson (Eds.) (2009) Global Climate Change Impacts in the United States. Cambridge University Press, Cambridge, United Kingdom.

New York State alone has more than $2.3 trillion in insured coastal property, but some major insurance companies are beginning to withdraw coverage in coastal areas of the Northeast, including New York City. A coastal flood in New York City currently considered a once-in-a-century event (also known as a 100-year flood) is projected to occur every 10 to 22 years on average by late this century, depending on a higher or lower emissions scenario." EPA acknowledges that the Northeast has diverse terrain and climatic conditions and thus the projected effects from climate change are likely to be varied. As noted in Section III.F.2, climate change impacts will vary in nature and magnitude across different regions of the United States.

5.11.3. Changes in Global Mean Temperature and Sea-level Rise Associated with the GHG Emissions Reductions

Organization: Institute for Energy Research

Comment:

A commenter indicates it is quite possible that EPA's estimate of the reduction in temperature and sea level rise is an overestimate. The estimate is predicated on a climate sensitivity in the range of 2°C to 4.5°C in accord with the Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report (AR4) 2007. However, actual temperature trends after the release of that report and more recent science provide some reasons to believe that a climate sensitivity of 2°C to 4.5°C may be overly sensitive. [OAR-2009-0472-7225.1, p.6]

EPA Response:

EPA acknowledges the large uncertainty range associated with equilibrium climate sensitivity. EPA notes that support of the current consensus range or likely range (2-4.5°C) comes from many different lines of evidence, the ranges of which are consistent within the uncertainties, relatively robust towards methodological assumptions and similar for different types and generations of models[39]. In addition, the IPCC[40,41] indicates the levels of understanding and confidence in quantitative estimates of equilibrium climate sensitivity have increased substantially and there is increased confidence of key processes that are important to climate sensitivity due to improved comparisons of models to one another and to observations. Thus,

[39] Knutti, R. and G. Hegerl (2008). "The equilibrium sensitivity of the Earth's temperature to radiation changes." Nature Geoscience 1: 735-743.

[40] Solomon, S., D. Qin, M. Manning, R.B. Alley, T. Berntsen, N.L. Bindoff, Z. Chen, A. Chidthaisong, J.M. Gregory, G.C. Hegerl, M. Heimann, B. Hewitson, B.J. Hoskins, F. Joos, J. Jouzel, V. Kattsov, U. Lohmann, T. Matsuno, M. Molina, N. Nicholls, J. Overpeck, G. Raga, V. Ramaswamy, J. Ren, M. Rusticucci, R. Somerville, T.F. Stocker, P. Whetton, R.A. Wood and D. Wratt (2007) Technical Summary. In: *Climate Change 2007: The Physical Science Basis.* Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor, and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

[41] Meehl, G.A. et al. (2007) Global Climate Projections. In: *Climate Change 2007: The Physical Science Basis.* Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

EPA concludes that the use of the climate sensitivity range for the climate analysis for this rule is appropriate and supported by the scientific literature from the major assessment reports.

In order to capture some of the uncertainty in the climate system, the changes in projected temperatures and sea level for this rule were estimated across the most current IPCC range of climate sensitivities, 1.5°C to 6.0°C. For each climate indicator analyzed the direction of change was the same across the range of climate sensitivities. EPA disagrees with the commenter that recent temperature trends after IPCC's AR4 2007 report provide adequate reason to believe that the climate sensitivity range of 2°C to 4.5°C is overly sensitive. Three years of additional temperature data are not likely to be sufficient to materially change estimates of climate sensitivity based on the instrumental record and has no impact on estimates of climate sensitivity based on paleoclimate analysis or other methods. Further, we note the commenter does not provide any references or material from the recent scientific literature to support this claim.

Organization: Shaw, Donald F.

Comment:

A commenter asserts that the claimed benefit (reduction) of 0.007 to 0.016 degrees Celsius (°C) in global mean temperature over 90 years is minuscule when compared to the inaccuracies of temperature measurement and uncertainties involved in climate science. The commenter continues to indicate that such small temperature numbers are immeasurable and meaningless as none of the equipment used to measure the temperatures can attain accuracy even within an order of magnitude of the claimed benefit. The commenter further notes the temperature records derived from thermometers and tree rings used by those who support global warming claims are nowhere near that accurate. In addition, the commenter asserts this same issue applies for the proposed reduction in sea level rise which is 0.06–0.15 centimeters (less than 1/16th of an inch). [OAR-2009-0472-7270.1, p. 1]

EPA Response:

EPA notes the projected reductions in global mean temperature and sea level from the rule are based on climate modeling analysis using a global emission reference scenario (no climate policy) and emissions reductions scenario which were subtracted from the reference scenario for the years 2000-2100 based on implementation of the rule as provided in Section III.F.1. This approach attempts to evaluate the impact of the rule's emissions reductions in the context of global GHG emissions. The results of the analysis should not be interpreted as detectable changes such as from the instrumental or observational records but discernible as quantifiable estimates calculated from the two emissions scenarios across a range of climate sensitivities. The observational record for global mean temperature (and sea level rise) is likely not sensitive enough to detect the direct response from any single mitigation action -- particularly a subset of emissions from a source category -- for several reasons (e.g., the inertia in the climate system due to the exchange of heat and energy between the atmosphere and the ocean, longevity (several decades) of perturbation from GHG emissions, global nature of the emissions problem where no single source dominates). Further, the instrumental record is not designed to detect such isolated signals. Although the commenter is correct that these relatively small changes in climate

variables would not be measurable with instrumentation or with observational evidence (e.g., tree-ring data), it does not preclude them from being valid in terms of demonstrating the directional changes resulting from the reduction in GHG emissions,

Organization: Institute for Energy Research
Shaw, Donald F.
Spurgeon, C. M.
Devon Energy Corporation
Wood, John S.
Stanton, Neil
Mass Comment Campaign

Comment:

A commenter indicates the proposed rule to regulate greenhouse gas emissions from light-duty vehicles, as well as EPA's proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, and *Massachusetts v. EPA,* 549 U.S. 497, 525 (2007) are all predicated on the assumption that regulating greenhouse gas emissions from light-duty vehicles will reduce the impacts of climate change. The commenter asserts that according to this proposed rule the climatic benefits from reducing greenhouse gas emissions from light-duty vehicles are very small and therefore will not affect climate change in any meaningful way.

Another commenter indicates that considering the minuscule benefit over a 90 year period, the benefit of prematurely invoking the miles per gallon (mpg) standards is even less significant. The commenter asks, "What is the net loss over 90 years if the regulation is postponed 10 years past the 2016 date?" The commenter asserts that it is clear that the objective is not science but giving an appearance of doing something. The commenter further indicates that these minuscule benefits will be offset many times by the massive increase in CO2 emissions by China and India and unilateral action is futile.
Another commenter indicates that EPA is proposing to increase the price of automobiles by $1,100 per car (74 Fed. Reg. 49460) in exchange for a projected global temperature decrease of 16 thousandths of a degree Celsius in 90 years. The commenter continues to indicate that according to EPA, sea level is projected to change by at most 1.5 millimeters. The commenter asserts these tiny amounts are so inconsequential that they will not affect global climate at all nor will they affect "public health and welfare."

EPA Response:

Climate change is a global phenomenon and EPA recognizes that this one national action alone will not prevent it. Importantly, EPA quantitatively analyzes the potential climate benefits of this rule which has the potential to substantially reduce GHGs emissions from the transportation sector, specifically light duty vehicles. The changes in climate effects that the rule is projected to produce – average of 2.9 ppm of CO_2, a few hundredths of a degree Celsius difference in global mean temperature, and 1 to 2 millimeters of sea-level rise, a small increase in ocean pH – are small. However, EPA notes this would be true for any given GHG mitigation action when taken

alone. Although the magnitude of the avoided climate change projected here is small, it shows a clear directional signal across all climate sensitivities evaluated. The benefits of GHG emissions reductions can be characterized both qualitatively and quantitatively, some of which can be monetized (see Chapter 7.5 of the final RIA).

EPA disagrees with the commenter's assertion that there is little consequence of waiting 10 years after 2016 to enact regulations given the small magnitude of climate benefits estimated for the rule. EPA notes a common misunderstanding is that the risks from climate change can be quickly addressed by emission reductions and thereby counter negative effects within a few years or decades. However, because of the longevity of atmospheric GHG gases warming effects persist over long timescales and continued and future emissions would imply further long-term climate-related effects on the planet[42]. As a substantial portion of CO_2 emitted into the atmosphere is not removed by natural processes for millennia, each unit of CO_2 not emitted into the atmosphere avoids essentially permanent climate change on centennial time scales. The value of EPA's analysis is not intended to diminish the effectiveness of the rule's effect on global climate conditions but to estimate the benefits of this particular action in reducing GHG emissions and global warming impacts by quantifying these potential reductions using the best available science.

EPA does not agree with the view that since other countries (e.g., China and India) have higher growth rates of greenhouse gas emissions that the EPA should not act now. Further, EPA does not agree with the commenter that reducing greenhouse gases in the U.S. will have no effect on global GHG emissions. As indicated in Section III.F of the rule, the U.S. transportation sector is the second largest contributor to this nation's greenhouse gas emissions behind only the electricity sector. Transportation sources under Section 202(a)[43] of the Clean Air Act (passenger cars, light duty trucks, other trucks and buses, motorcycles, and passenger cooling) represent 23% of total U.S. GHG emissions in 2007 and 4.3% of total global GHG emissions. Moreover, section 202(a) GHG emissions are a significantly larger share of global transport GHG emissions (28.0%) than the corresponding share of all U.S. GHG emissions to the global total (18.4%), reflecting the relative size of the transport sector in the United States compared to the global average. As the Supreme Court noted, ''[j]udged by any standard, U.S. motor-vehicle emissions make a meaningful contribution to greenhouse gas concentrations and hence, * * * to global warming.'' Massachusetts v. EPA, 549 U.S. 497, 525 (2007).

EPA's rule takes many factors into consideration, and is not premised on the view that the reductions from this rule will themselves have significant impacts on the global climate. As discussed above, no one action will have that effect. The factors EPA takes into account include its legal obligation to set emissions standards applicable to vehicular GHG emissions, given the endangerment and cause or contribute findings made by EPA, its analysis of available technology, the cost of the technology, the fuel savings that will result from the standard, the

[42] Solomon, S., G.-K. Plattner, et al. (2009). "Irreversible climate change due to carbon dioxide emissions." Proceedings of the National Academy of Sciences 106: 1704-1709.

[43] Source categories under Section 202(a) of the Clean Air Act are a subset of source categories considered in the transportation sector and do not include emissions from non-highway sources such as boats, rail, aircraft, agricultural equipment, construction/mining equipment, and other off-road equipment.

greenhouse gas reductions, implications for vehicle safety, consideration of the rule's costs in relation to benefits, and other impacts. EPA has considered a wide variety of factors in determining that its GHG emissions standards are a reasonable exercise of its authority under section 202(a) (1). The impact of these reductions on climate change is but one of the factors EPA considered.

Organization: Eadie, R. Frank

Comment:

A commenter indicates there are new scientific procedures that actually allow scientists to track both the CO_2 levels and climate indicators such as sea levels going back millions of years instead of hundreds of thousands of years. The commenter indicates that it is known that sea level is rising and will likely accelerate based on projections. New studies that have been done with the models indicate that the standards that IPCC used in their projections in 2006 are actually beyond the level of the worst case scenario that the IPCC had projected. The commenter indicates that instead of 2 °C change between now and the end of the century it may be 4 °C change by the end of the century. The commenter indicates that all the scientists agree that a warming of four degrees centigrade is simply unacceptable and civilization as we know it will not exist under those conditions. [EPA-HQ-OAR-2009-0472-4621, p.172-175]

EPA Response:

EPA acknowledges that the risks and impacts of climate change are occurring now and will continue to increase over this century and that sea level is projected to rise when compared to the previous century. As summarized in the Technical Support Document[44] of EPA's Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act,[45] the IPCC reports that by the end of the century (2090-2099), sea level is projected to rise by 18 and 59 cm relative to the base period (1980-1999). The IPCC projections contain the lowest and highest projections of the 5 to 95% ranges for all Special Report on Emission Scenarios (SRES) reference emission scenarios and include neither uncertainty in carbon cycle feedbacks nor rapid dynamical changes in ice sheet flow. The projections represent a 'likely range' which inherently allows for the possibility that the actual rise may be higher or lower.

Recent observations and studies from the scientific assessment literature suggest that sea level rise is likely to be near or above the high end of the IPCC estimates. For example, according to the Climate Change Science Programs[46] studies have suggested that a global sea level rise of 1 m (and up to 1.4 m) is plausible within this century if increased melting of ice sheets in Greenland

[44] "Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act" Docket: EPA-HQ-OAR-2009-0472-11292
[45] See 74 FR 66496 (Dec. 15, 2009)
[46] CCSP (2009) *Coastal Sensitivity to Sea-Level Rise: A Focus on the Mid-Atlantic Region.* A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. [James G. Titus (Coordinating Lead Author), K. Eric Anderson, Donald R. Cahoon, Dean B. Gesch, Stephen K. Gill, Benjamin T. Gutierrez, E. Robert Thieler, and S. Jeffress Williams (Lead Authors)], U.S. Environmental Protection Agency, Washington DC, USA, 320 pp.

and Antarctica is added to the factors included in the IPCC estimates. The IPCC[47] notes "dynamic processes related to ice flow not included in current models but suggested by recent observations could increase the vulnerability of the ice sheets to warming, increasing future sea level rise." In addition, the Climate Change Science Program (CCSP)[48], finds that the Greenland and West Antarctic ice sheets show acceleration of flow and thinning, and that inclusion of these processes in models will likely lead to sea level projections for the end of the 21st century that substantially exceed the projections presented in the IPCC Fourth Assessment Report (2007).

Importantly, EPA notes that the underlying scientific literature does not include predictions of conditions where civilization cannot exist but rather, will likely face challenges from climate change and sea level rise. In addition, these are global projections and climate change impacts will vary in nature and magnitude across different regions of the United States.

Organization: Environment New Jersey
New York State Department of Environmental Conservation

Comment:

Environment New Jersey

A commenter indicates that predictions of a two to four foot sea level rise in New Jersey are incredibly dire. The commenter notes that in New Jersey the Meadowlands, which include such landmarks as New Jersey Turnpike, the Newark Airport and Giants Stadium, all are within floodplain mapping zones for storm surges. The commenter further notes that several New York financial firms in Hudson County are on the line of the submerging and storm surge lines. The commenter indicates that the 27 miles of coast of New Jersey is the lion's share of our tourism industry, a $38 billion industry for the state, as well as home to casinos and Atlantic City. The commenter indicates that most of New Jersey's shore would suffer from storm surge on an unprecedented level and the estimates on real estate damage and loss are astronomical. [These comments were submitted as testimony at the New York public hearing. See docket number EPA-HQ-OAR-2009-0472-4621, p.73]

New York State Department of Environmental Conservation

Another commenter indicates that sea level rise along New York State's coastal areas will erode beaches, damage sensitive ecosystems and cause billions of dollars in flood damage to vital infrastructure. [These comments were submitted as testimony at the New York public hearing. See docket number EPA-HQ-OAR-2009-0472-4621, p. 12]

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[47] Meehl, G.A. et al. (2007) Global Climate Projections. In: *Climate Change 2007: The Physical Science Basis.* Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

[48] Clark, P.U., A.J. Weaver, E. Brook, E.R. Cook, T.L. Delworth, and K. Steffen (2008) Executive Summary. In: *Abrupt Climate Change.* A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. U.S. Geological Survey, Reston, VA, pp. 7–18.

EPA Response:

EPA acknowledges the commenters' concerns regarding sea-level rise for the States of New Jersey and New York and note they are generally consistent with the overview of climate change impacts provided in this rule (preamble Section III.F.2). Section III.F of the preamble to the vehicle rule summarizes climate change science and impacts from the major scientific assessment reports (e.g., IPCC, USGCRP, NRC) on climate science. As indicated in Section III.F.2, sea level rise is one of the potential regional impacts to affect the Northeast. Sea level rise is expected to increase storm surge height and strength, flooding, erosion, and wetland loss along the coasts, particularly in the Northeast, Southeast, and islands. Further, Section III.F.2 notes that "Coastal communities and habitats will be increasingly stressed by climate change impacts interacting with development and pollution. Sea level is rising along much of the U.S. coast, and the rate of change will very likely increase in the future, exacerbating the impacts of progressive inundation, storm-surge flooding, and shoreline erosion. Storm impacts are likely to be more severe, especially along the Gulf and Atlantic coasts." EPA notes however, that localized climate change impact assessments for the specific areas of New York and New Jersey are not estimated as part of this national vehicle rule.

Organization: State of New Jersey

Comment:

A commenter indicates the EPA relied on the MAGICC model to determine the overall impact of its rule on climate change. These modeling results showed small, but quantifiable, reductions in the global atmospheric CO_2 concentration, as well as a reduction in projected global mean surface temperature and sea level rise, from implementation of the proposal, across all climate sensitivities. The commenter agrees with the proposal's assessment of the emission reduction benefits of the proposal and its impacts on climate change and encourages the Agencies to move forward with the joint rule. [OAR-2009-0472-7109.1, p.10]

EPA Response:

Similar to the commenter's assertion, based on EPA's modeling approach, EPA notes the emission reductions resulting from this rule directionally represent a reduction in the adverse risks associated with climate change.. This modeling approach attempts to evaluate the impact of the rule's emissions reductions in the context of global GHG emissions. EPA's analysis estimates the benefits of this particular action in reducing GHG emissions and global warming impacts by quantifying these potential reductions using the best available science.

As mentioned previously, EPA's rule takes a wide variety of factors into consideration in determining that its GHG emissions standards are a reasonable exercise of authority under section 202(a).

Organization: Adcock, James

Comment:

The impact on climate change must be analyzed as part of an assumed national and international program to reduce GHG. To attempt to analyze CAFE in isolation is to assume the failure in human efforts to control global warming. When you assume a priori the failure in such efforts to control global warming, then the impacts of CAFE towards global warming can indeed be assumed trivial and be discounted away. Again, a priori, in methods of accounting and analysis, NHTSA is assuming the failure of world-wide efforts to control GHG. Such an assumption is inconsistent with the positions of the current President.

EPA Response:

We agree that addressing climate change will require global action, and will rely on both international and domestic programs. However, for the purpose of this rulemaking, it is necessary to quantify the impacts and understand the benefits of this particular action -- which is a part of the greater whole in responding to this challenge.

5.12. EPA Estimated Impact on Non-GHG Emissions and Their Associated Effect

Organization: Missouri Department of Natural Resources, Air Pollution Control Program

Comment:

The commenter [EPA-HQ-OAR-2009-0472-7480, p.1] is concerned that the vehicle standards in the proposed rule may lead to increases in criteria pollutant and air toxic emissions from mobile sources. In addition to providing comments on the proposed rule, the commenter also included a variety of comments that pertain to NHTSA's DEIS ("Criteria Pollutant Emissions" pp. 2-3, "Toxics Pollutant Emissions" pp. 3-4, "Localized Calculation of Emissions Reductions" pp. 4-5, and "Summary of Comments" p. 5). The commenter [OAR-2009-0472-7480, pp. 4-5] expresses concern that the results of NHTSA's DEIS project that some urban areas may have an increased level of criteria and toxic emissions resulting from the rebound effect. These results for nonattainment and maintenance areas are of particular concern because of the air quality status of the two largest urban areas in Missouri. St. Louis is currently designated as nonattainment for ozone and PM. Kansas City is designated as a maintenance area for ozone.

NHTSA and EPA only examined the emission reductions of benzene, 1,3-butadiene, formaldehyde, acetaldehyde, and acrolein, but should also have included other air toxics such as ethylbenzene, toluene, and the xylene isomers. It appears NHTSA and EPA's examination was incomplete, thus, raising questions on the results of the examination presented in this Federal Register notice. To address these concerns, the agencies should examine the emission reductions of all of the air toxics associated with the extraction, production, distribution, as well as the combustion, of fuel. In Table III.G-2 Annual Air Toxic Emission Impacts of Program (short-tons) on page 49593, NHTSA and EPA presented their estimation of the influence of the actions of their proposed National Program on the emissions of the aforementioned air toxics. According to the data in 2030 the proposed National Program would increase the emissions of 1,3-butadiene, acetaldehyde, and acrolein, and would decrease the emissions of benzene and

formaldehyde. The increased emissions equaled 100 short tons and the decreased emissions equaled 93 short tons for a net increase of 7 short tons of air toxic emissions. These increased emissions were due to downstream impacts reflecting the effects of the previously mentioned VMT rebound effect rather than upstream impacts reflecting the extraction, production, and distribution of motor gasoline. The data presented in Table III.G-2 therefore showed that the proposed actions of the National Program would increase the emissions of the aforementioned air toxics due to the increased total amount of gasoline undergoing combustion.

Yet the two agencies seemed to ignore the data presented in Table III.G-2. The agencies state on page 49709 that, 'For most of these pollutants, the reduction in upstream emissions resulting from lower fuel production and distribution will outweigh the increase in emissions from vehicle use, resulting in a net decline in their total emissions.' The data presented in Table III.G-2 contradicts this statement and neither agency presented data anywhere else in this notice that supported this statement. To correct this contradiction, NHTSA and EPA should present evidence that demonstrates the actions of the proposed National Program will not increase air toxics emissions from mobile sources. [OAR-2009-0472-7480, pp.2-3]

EPA Response:

EPA understands the commenter's concern that the GHG vehicle standards may lead to increased emissions of some pollutants from mobile sources. However, emissions changes alone are not a good indication of local or regional air quality impacts. The atmospheric chemistry related to ambient concentrations of PM2.5, ozone and air toxics is very complex, and making predictions based solely on emissions changes is extremely difficult. Full-scale photochemical modeling is necessary to provide the needed spatial and temporal detail to more completely and accurately estimate the changes in ambient levels of these pollutants. The length of time needed to prepare the necessary emissions inventories, in addition to the processing time associated with the modeling itself, precluded EPA from conducting a full-scale photochemical air quality modeling analysis in time for the NPRM. For the final rule, however, EPA performed a national-scale air quality modeling analysis to analyze the impacts of the standards on $PM_{2.5}$, ozone, and selected air toxics (i.e., benzene, formaldehyde, acetaldehyde, acrolein and 1,3-butadiene).

As discussed in Section 7.2 of the RIA, EPA's air quality modeling projects that final standards have relatively little impact on ambient concentrations of modeled $PM_{2.5}$, ozone, and air toxics. For annual and 24-hour $PM_{2.5}$, our air quality modeling projects design value changes of ±0.05 $\mu g/m^3$ for all Missouri counties, with the exception of one county near St. Louis which is projected to see decreases in annual and 24-hour $PM_{2.5}$ design values between -0.05 and -0.15 $\mu g/m^3$ (Section 7.2.2.1 of the RIA). Ozone design value changes as a result of the GHG standards finalized in this rule are ±0.1 ppb for all counties in Missouri. EPA notes that the commenter's concerns pertaining to NHTSA's DEIS are addressed in NHTSA's DEIS Comment Response document, available in NHTSA's docket for this rulemaking: NHTSA-2009-0059.

Although a large number of compounds which are considered air toxics could be impacted by the GHG vehicle standards, EPA focused on those which were identified as national and regional-scale cancer and noncancer risk drivers in past NATA assessments and were also likely to be

significantly impacted by the standards. These compounds include benzene, 1,3-butadiene, formaldehyde, acetaldehyde, and acrolein. In addition to developing emission inventories for these explicit model species in our photochemical model, EPA also developed inventories for a large number of precursor compounds, including aromatics such as ethylbenzene, toluene, and xylene isomers, through application of speciation profiles in SMOKE (see also Section 7.2.1.2 of the RIA). Thus, EPA does account for changes in the both upstream and downstream emissions of numerous air toxics beyond the five species for which we present air quality modeling results.

In addition, EPA is projecting overall decreases in most criteria and air toxic pollutant emissions due to the GHG standards (see Tables III.G-1 and III.G-2 in the preamble to the final rule). In most cases the net impacts are less than 1% of the projected 2030 inventory. As seen in the tables, EPA projects that the net impact of the program is a slight decrease in the majority of modeled emissions, and a slight increase in the remainder. The calculation of these impacts is documented in RIA Chapter 5 (substantially similar to the analysis presented in the record to the proposed rule). As discussed above, changes in emission inventories alone are not a good indication of local or regional air quality impacts. Overall, EPA's photochemical air quality modeling indicates that the final standards have relatively little impact on national average ambient concentrations of the modeled air toxics. Regional increases in formaldehyde, 1,3-butadiene, acrolein, and ethanol are not due to the standards finalized in this rule, but are related to our assumptions about the volume of ethanol that will be blended into gasoline. The ethanol volumes will be occurring as a result of the recent Renewable Fuel Standards (RFS2) rule and were accounted for by EPA in assessing the impacts of that rule.[49] For additional detail on air toxics results, please see Section 7.2.2.3 of the RIA.

Organization: Texas Commission on Environmental Quality

Comment:

The commenter [EPA-HQ-OAR-2009-0472-7180] argues that the rule proposal states that the new GHG emission standards will increase vehicle efficiency and, thereby, lower fuel consumption. However, the proposal acknowledges that the new GHG emission standards will also likely increase light-duty vehicle use as a result of the 'rebound effect' associated with higher fuel economy, resulting in increased criteria pollutant emissions. The 'rebound effect' is defined in the proposal as 'the tendency of drivers to drive their vehicles more as the cost of doing so goes down, as when fuel economy improves.' The proposal claims that the anticipated increase in criteria pollutants associated with the rebound effect would be offset by reduced emissions from reductions in domestic fuel refining and distribution brought about by lowering fuel consumption. [OAR-2009-0472-7180.1, p.2]

The commenter [EPA-HQ-OAR-2009-0472-7180, p. 2] is concerned that new GHG emissions standards for light-duty vehicles would result in increases in criteria pollutant emissions that are of critical importance for compliance with the NAAQS for ozone, primarily emissions of VOC and NOx. Specifically, the commenter is concerned that "in areas with little or no fuel refining

[49] EPA 2010, Renewable Fuel Standard Program (RFS2) Regulatory Impact Analysis. EPA-420-R-10-006. February 2010. Docket EPA-HQ-OAR-2009-0472-11332

industry, such as the Dallas-Fort Worth ozone nonattainment area, the rebound effect would result in an increase in criteria pollutant emissions." The commenter is also expressed concern about the "anticipated increases in acetaldehyde and 1,3-butadiene."

The TCEQ has implemented a number of regulatory air quality control strategies in its ozone nonattainment areas to reduce VOC and NO_x emissions and is concerned that the adoption of the proposed rules for new GHG emissions standards for light-duty vehicles will have a negative impact on the efforts Texas has made to meet its current and future air quality goals, especially as EPA looks to tighten the ozone standard again. Additionally, the EPA is encouraged to align the mobile source control strategies with ozone reduction needs. Texas has made great strides in reducing ozone and ozone precursors from federally preempted mobile sources by incentivizing mobile fleet turnover through our Texas Emissions Reduction Plan and the Drive a Clean Machine program, and placing stringent controls on stationary sources. Because mobile source emissions now comprise the majority of NO_x emissions in Texas metropolitan areas, EPA should not let its GHG rulemaking initiatives interfere with the ability of states to attain and maintain increasingly stringent National Ambient Air Quality Standards. Unlike GHG emissions, increases in criteria pollutant emissions may have direct health impacts on the citizens of Texas. [OAR-2009-0472-7180.1, p.2]

EPA Response:

The non-GHG inventories and associated air quality modeling presented by EPA include the impacts of both the upstream and downstream emission consequences of the rule, including the impact of a rebound effect. This is described more fully in RIA Chapters 5 and 7.

EPA understands the commenter's concern about increases in criteria pollutant emissions that are important to attainment of the ozone NAAQS. EPA does not believe this rule will interfere with attainment of the ozone NAAQS. As discussed in Section 7.2 of the RIA, EPA's photochemical air quality modeling projects that the final standards have relatively little impact on ambient concentrations of ozone. Ozone design value changes as a result of the GHG standards finalized in this rule are ±0.1 ppb for all Texas counties, with the exception of four counties in the greater Houston area which see ozone design value decreases between -0.1 and -0.2 ppb due to projected upstream emissions decreases in NO_X and VOCs from reduced gasoline production. For annual and 24-hour $PM_{2.5}$, our air quality modeling projects design value changes of ±0.05 $\mu g/m^3$ for the majority of the counties in Texas. Some Houston-area counties are projected to see decreases in annual and 24-hour $PM_{2.5}$ design values between -0.05 and -0.25 $\mu g/m^3$ (Section 7.2.2.2 of the RIA).

Our modeling analysis of air toxics, described in Section 7.2.2.3 of the RIA, projects that ambient concentrations of acetaldehyde and 1,3-butadiene will decrease in Texas. EPA notes that we will be analyzing air quality impacts of increased renewable fuel use as required by the "anti-backsliding" provisions of Clean Air Act section 211(v), which also requires EPA to promulgate mitigation measures as appropriate, following that study.

Organization: South Coast Air Quality Management District

Comment:

The proposed emission standards and companion fuel economy standards will result in a significant reduction in greenhouse gas emissions as well as provide crucially important co-benefits in reducing criteria emissions in support of attainment of federal and state air quality standards for ozone and fine particulates. [Comments are from LA Testimony, OAR-2009-0472-7283, pp.59-67]

EPA Response:

As discussed in the RIA Chapter 7.2, EPA's air quality modeling projects relatively little impact on ambient concentrations of criteria pollutants and toxics, but there are net benefits associated with reductions in $PM_{2.5}$.

Organization: New York State Department of Environmental Conservation

Comment:

EPA's analysis projects criteria pollutant emission reductions as a result of implementation of these standards. In particular, emissions reductions are expected from fuel production and distribution industries. These reductions are background information, and provide some assurance that criteria pollutant emissions increases are unlikely. These reductions, and their geographic distribution, are not sufficiently certain to justify viewing them as offsets for emissions increases from other programs such as the Renewable Fuel Standard. [OAR-2009-0472-7454, p.5]

EPA Response:

EPA does not view any emissions reductions from this rule as "providing offsets" for emissions increases from other rules. EPA has an obligation under the "anti-backsliding" provisions of Clean Air Act section 211(v) to analyze the air quality impacts of increased renewable fuel use and promulgate mitigation measures as appropriate.

Organization: Yuli Chew, Private Citizen

Comment:

For the rebound effect, in the CARB's Regulations to Control Greenhouse Gas Emissions from Motor Vehicles, Final Statements of Reasons, August 4, 2006, ARB staff estimates that the rebound and fleet turnover impacts are essentially offset by the benefits from reduced fuel cycle emissions. [OAR-2009-0472-7042.1, p.5]

I also believe that the rebound and fleet turnover impacts are essentially offset by the benefits from reduced fuel cycle emissions.[OAR-2009-0472-7042.1, p.6]

EPA Response:

The commenter states that the reduction in upstream emissions decreases is roughly equivalent to the rebound emissions, and references a California Air Resources Board report (http://www.arb.ca.gov/regact/grnhsgas/fsor.pdf). As shown in Preamble Section III.G, for volatile organic compounds (VOC), nitrogen oxides (NOx), and particulate matter ($PM_{2.5}$), upstream reductions are slightly larger than the emissions increases attributed to the rebound effect when a 10% rebound effect estimate is used. There are both upstream and downstream decreases of SOx emissions. EPA provides a full discussion of the impacts of rebound and upstream emissions in Section III.G of the preamble to the final rule and in Chapter 5 of the RIA.

5.12.1 Upstream Impacts of Program

Relevant comments have been included in Section 5.12.

5.12.2 Downstream Impacts of Program

Relevant comments have been included in Section 5.12.

5.12.3. Health Effects of Non-GHG Pollutants

Organization: American Lung Association of California
Physicians for Social Responsibility, Los Angeles
California State Senate
Environment New Jersey
South Coast Air Quality Management District

Comment:

American Lung Association of California

California's unique air quality problems demand the strongest possible action to fight global warming. Our state is home to some of the worst air quality in the nation, largely due to motor vehicles, and this air pollution crisis has created a public health crisis. The American Lung Association's 2009 national State of the Air report continued to demonstrate that California dominates the lists of worst polluted cities in the country. The report found that California has 6 out of the top 10 worst ozone polluted cities in the country and again listed the Los Angeles region as home to the worst ozone pollution in America.

Higher levels of death and illness from pollution exposures is experienced by vulnerable individuals, including those with asthma or other respiratory and cardiac illnesses, the elderly, infants, children, teenagers, low income communities, communities of color, and people living near pollution hot spots including heavily travelled roads. There are millions of individuals that are particularly vulnerable to pollution in our region.

Just as the transportation sector is the primary source of criteria pollution in California, it is also the primary source of greenhouse gases, and global warming is expected to worsen ozone pollution and its health effects. California and the rest of the country depend on this proposed

regulation as a key step to reduce this major source of global warming emissions. Without strong action, rising temperatures from global warming will likely lead to even more illness and suffering from increases in air pollution and pollen production, longer and more intense heat waves, and devastating wildfires and related smoke exposure. Recent research conducted by UC Berkeley estimates that the public health costs to California from global warming will add an additional cost of $3 billion to $24 billion annually depending on our success in reducing greenhouse gases. Scientists predict that here in Los Angeles, global warming will cause the number of heat wave days to rise dramatically, which could lead to a 75-85% increase in the number of days with unhealthy air quality.

[OAR-2009-0472-7216.1, Docket Number OAR-2009-0472-7216/7216.1 These comments are from testimony presented at the LA public hearing.]

Physicians for Social Responsibility, Los Angeles

Also when we focus on the health impacts of these tailpipe emissions and air pollution, for many years we have spoken, and rightly so, on the issues of asthma and respiratory disease. We must remember that air pollution poses a significant threat to the health of women who live in high-traffic areas.

Over the last decade, a large number of studies have investigated the possible adverse effects of ambient air pollution on birth outcomes. A number of key studies have been done in Los Angeles. The work of Dr. Beate Ritz, the doctor who worked with Dr. Tracy Woodruff, have shown that -- and both published in Environmental Health Perspectives -- have shown that there is a significant implication of air pollution in adverse birth outcomes, low birth weight, changes to the health of damaged heart valve development.

[These comments are from LA Testimony, OAR-2009-0472-7283, pages 79-85]

California State Senate

There is a compelling link between global warming and air pollution. Warmer temperatures increase our ozone and smog forming pollutants. We have alarming and growing respiratory illness, asthma and cancer rates occurring among our youth and the elderly. Several intense heat waves over weeks at a time have caused illness and deaths. Lower income neighborhoods that often lack air conditioning are particularly at risk during heat episodes. Agricultural losses, increases in vector borne diseases, and a dramatic increase in loss of property and air pollution from costly wildfires have become the new normal.

California is not the only state that is impacted by air pollution. From Denver, to Chicago, to Albuquerque New Mexico, air pollution is a serious health problem. Two years ago, I testified in Santa Fe, New Mexico as they were having a hearing on adopting California's Clean Car standards. Several doctors and pediatricians, on their own initiative, came to support the policy because of their concerns of their patients' health. For many, they said it was the first time they had ever testified at a government hearing.

[OAR-2009-0472-7275.1, also EPA-HQ-OAR-2009-0472-7283, pp. 13-20]

Environment New Jersey

Something that's clear to residents, especially from north Jersey, is the impacts of light-duty vehicles, cars and trucks, on our air pollution. In New Jersey, the majority of our counties still remain out of compliance with U.S. EPA health standards, to the extent that the asthma levels are certainly higher in New Jersey than other areas. They're especially high in urban areas that are closest to some of the largest highways in the state. These are again the externalities that were touched upon in the National Academy of Sciences report and these literally mean thousands of asthma attacks per year as well as increased levels of cancer and heart disease. [EPA-HQ-OAR-2009-0472-4621, pp. 77-78]

South Coast Air Quality Management District

[The following comments are from LA public hearing testimony OAR-2009-0472-7283, pp. 59-67.]

Over 25 percent of the nation's exposure to the eight-hour ozone standard occurs here in the South Coast Air Basin, while over 50 percent of the nation's 24-hour $PM_{2.5}$ standard exposure occurs here.

There are over ten million registered light-duty vehicles in the South Coast Air Basin. Reductions in fuel use associated with the standards proposed will therefore have a direct and tangible benefit in terms of public health and welfare in our region.

The Air Resources Board has shown its sensitivity in addressing this issue while carefully balancing social and industry needs to minimize cost and maximize consumer choice while maximizing overall benefits.

Central to this determination is the imperative to improve public health. We are especially pleased, therefore, that the ARB's program is fashioned around the value that there can be no tradeoff between greenhouse gas emissions and criteria emissions.

EPA Response:

EPA agrees that there is a link between climate change and air pollution. For instance, as summarized in the Technical Support Document of EPA's Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act, according to the Intergovernmental Panel on Climate Change, climate change is expected to lead to increases in regional ozone pollution in the United States.[50,51]

[50] "Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act" Docket: EPA-HQ-OAR-2009-0472-11292
[51] See 74 FR 66496 (Dec. 15, 2009)-8

In addition, emissions from light-duty vehicles contribute to ambient air pollution that poses significant health concerns. Section 7.1 of the RIA for this rule details the health effects associated with $PM_{2.5}$, ozone, CO, NOx, SOx and several air toxics. EPA agrees that air pollution in high-traffic areas is a significant issue; Section 7.1.1.6 of the RIA discusses exposure and health effects associated with traffic specifically. In addition, see Section III.G and III.H of the preamble to the final rule and Chapter 7 of the RIA for a discussion of the air quality and monetized health benefits of this rule.

5.12.4 Environmental Effects of Non-GHG Pollutants

No comments were received on the environmental effects of non-GHG pollutants. The Center for Biological Diversity's comments on the Endangered Species Act are addressed in Section 4.7 of this document.

5.12.5. Air Quality Impacts of Non-GHG Pollutants

Relevant comments have been included in Section 5.12.

5.13 EPA Estimated Cost, Economic, and Other Impacts

5.13.1 Conceptual Framework for Evaluating Consumer Impacts

"Energy Paradox"

Organization: American Council for an Energy Efficient Economy
Consumer Federation of America
International Council on Clean Transportation
University of Michigan Transportation Research Institute (UMTRI)
Consumer Federation of America
Union of Concerned Scientists
James Adcock
New York University School of Law, Institute for Policy Integrity (IPI)

Comment:

American Council for an Energy Efficient Economy

In terms of consumer welfare, from this perspective, the discussion of consumer welfare impacts of the proposed rule is troubling. The agencies' finding that raising fuel economy will increase consumer welfare despite the modest share of vehicles purchased today that are highly efficient is not a conundrum, but rather a manifestation of extensively studied failures in the market for energy for energy efficiency. The vehicles that will enable manufacturers to meet the new standards by and large are not available today. The standards have been designed to allow vehicles in each market segment to attain the required fuel economy and emissions levels

without changes to other vehicle properties. [These comments were submitted as testimony at the New York public hearing. See docket number EPA-HQ-OAR-2009-0472-4621, pp. 146-147.]

Consumer Federation of America

The very large potential efficiency gains estimated by the engineering/economic analysis conducted by NHTSA/EPA, which can be most easily summarized by nothing that, even at the highest and most expensive level, the cost of saved energy is about one-third of the price to consume energy, are at the core of a decades long debate over fuel economy standards. In a capitalist economy, when problems are serious, like rising energy prices and imports, and a solution is inexpensive and potentially widely available, one would expect people to seize it. The existence of the "efficiency gap" immediately raises the question: "Why don't people buy more of it?'

The efficiency gap is not new, nor is it confined to the transportation sector. A similar efficiency gap is found in building sector energy consumption. As Exhibit I-1 shows, the magnitude of the problem is similar across sectors. In the past few months, four major national research institutions have released reports that document the huge potential for investments in energy efficiency to lower consumers' bills and greenhouse gas emissions, creating a win-win for consumers and the environment. The National Research Council of the National Academy of Sciences has estimated the potential reduction in electricity, natural gas and gasoline at approximately 30 percent, similar to the estimates of NHTSA/EPA. McKinsey and Company and the American Council for Energy Efficient Economy have reached a similar conclusion on electricity and natural gas. Across these three sectors, saving energy costs about one third of the price of consuming it. See [OAR-2009-0472-7272.1, pp.15-22] for extensive analysis

[The following comments were submitted as testimony at the Detroit public hearing. See docket number EPA-HQ-OAR-2009-0472-6185, pp. 108-111]

Our research shows that the market failure is on the supply side as well as the demand side. Survey research shows there is a huge mismatch between consumer demand and the vehicles offered in the marketplace for efficiency. Analysis shows that consumers began shifting their consumption patterns five years ago, but the automakers were unwilling or unable to respond, and they were left with a growing number of vehicles that they could not sell.

But the most ironic fact is the following: The behavioral economics literature that the agencies cited in their notice conclude that consumers are deficient in motivation, perception, and calculation, and that that is a basis on which to conclude there is a market failure. But at the same time those models incorrectly assume that producers are perfect, have perfect information, perfect foresight, and perfect analytic capability.

It turns out, as the headline of the Detroit Free Press says today, 'Producers are people, too.' They suffer the same deficiencies of motivation, perception, and calculation, and it turns out they also have perverse incentives to exploit information asymmetries and abuse market power to increase profit.

So these two sets of far-from-perfect actors come together in a set of market institutions that compound and magnify their deficiencies. The result is a 30-percent market failure, one of the grossest inefficiencies in our whole economy. We consume 30 percent more energy than we should if we're behaving efficiently. That shortfall costs consumers, reduces consumer welfare, and fuel economy standards are the way to address it.

So EPA and NHTSA have an opportunity in the current rulemaking to establish a platform on which a dynamic, innovative automobile sector can be built in America, one which meets the needs for transportation in our continental economy in a manner that saves consumers money, enhances national security through reduced oil imports, and ensures the transportation sector makes its fair contribution to meeting the challenge of global warming.

To build that platform it is critically important to recognize the vital role that fuel economy standards play in correcting market failures and set standards at a level that captures the full measure of the value of the increased efficiency. In so doing, they will create an environment in which a new automobile industry can thrive. We look forward to working with the agency to build that platform.

International Council on Clean Transportation

The impact of the proposed standards on consumer welfare is the subject of much debate in the proposal, reflecting the lack of clarity and understanding of this issue in general. The debate revolves around the so-called Energy Paradox. Assuming full information and perfect foresight, standard economic theory says that consumers will make optimal tradeoffs between the purchase price and subsequent operating costs. In short, the problem is that consumers appear not to purchase products that are in their economic self-interest.

Both agencies chose to exclude estimates of consumer welfare loss due to changes in vehicle choice. Although this was done primarily because of methodological concerns, ICCT supports this decision and does not believe there is significant consumer welfare loss in this case. Consumers do undervalue fuel savings because of uncertainty and loss-aversion and generally understand that standards do not reduce their welfare, as explained below.

There is substantial circumstantial evidence that most consumers in the U.S. place a low value on fuel economy. For example, Turrentine and Kurani, 1 conducted an in depth survey of the car-buying histories of 57 California households. None of these 57 households made any kind of quantitative assessment of the value of fuel savings and only 9 stated they compared the fuel economy of vehicles in making their choice. The selected consumers were largely unaware of their annual fuel cost, in contrast to general knowledge of the daily price fluctuations of a gallon of gasoline. Turrentine and Kurani concluded that: "When consumers buy a vehicle, they have neither the tools nor the motivation nor the basic building blocks of knowledge to make a calculated decision about fuel costs."

Turrentine and Kurani's findings were not based upon a representative sample, but they are generally supported by the results of a 2007 national random survey of 1,030 households (Opinion Research, 2007). When asked about their last vehicle purchase, 39 percent of

respondents indicated they did not consider fuel economy at all and, of those who did, only 14 percent mentioned taking fuel costs or gasoline prices into consideration.

The question that has been debated for decades is simply – why? This is an extremely important question, as most of the calculation of consumer welfare is based on the answer. If consumers are already receiving their optimum level of fuel economy, then efficiency standards will decrease their welfare. However, if there are valid reasons why consumers are not making optimal tradeoffs at the time of vehicle purchase, or if the entire question is not being framed properly, then efficiency standards could increase consumer welfare.

NHTSA, EPA, and the U.S. Office of Management and Budget (OMB) all recognize the importance of the Energy Paradox, but state that it is not currently possible to fully account for all effects on consumer welfare. While they all estimate the benefits of the GHG rule would outweigh eventual losses of associated private welfare, they suggest further analyzing the subject of consumer welfare for future rule making:

EPA said they are not able to estimate the consumer welfare loss that may accompany the actual fuel savings from the proposal and asked for comments "on how to assess these difficult questions in the future". NHTSA invites comments "on the state of the art of consumer vehicle choice modeling, as well as on the prospects for these models to yield reliable estimates of changes in consumer welfare from requiring higher fuel economy." OMB provided a 17 page document containing suggested revisions for sections III.H and IV.G of the preamble. While their suggestions were not incorporated into the text in the proposed rule, their document indicates OMB's concern about consumer welfare and their desire to settle the long-standing issues. Compared to the language in the preamble, the OMB language is more precise and clear and the text is more structured. For example, they would have rewritten EPA's request for comments to say, "EPA is not in a position to produce empirical estimates of the magnitude of these losses. We lay out a framework for how EPA will make progress on this issue for future rulemakings."

NHTSA and EPA accurately discussed the uncertainty-loss aversion theory in the proposal. However, it was presented as one of an array of possible explanations. Not only is uncertainty-loss aversion sufficient to explain consumer behavior by itself, but the other forms of market failure can also be viewed simply as factors increasing the uncertainty of the future fuel cost savings.

Does this mean that customers only value 3 years of fuel savings and that their consumer welfare will decrease if standards force them to save money on fuel from technologies that achieve a fuel-savings based payback in more than 3 years? Not necessarily. There are two important issues that affect the conclusion: (1) Standards change the status quo by removing the option to buy a vehicle without the additional efficiency technology – it is not presented to the customer at all. (2) Standards require everyone to purchase higher levels of efficiency technology, not just individual customers, leading to indirect consumer welfare benefits.

The concept of consumer welfare under standard economic theory is based upon individual choices. However, efficiency standards affect everyone, not just individual customers. This

changes the calculation of consumer welfare. The individual's welfare is now the sum of the direct impact on the individual and the indirect benefit to the individual of forcing other customers to buy more efficient vehicles.

There is also a potential issue with the consumer welfare of second and subsequent owners. In reality, the original purchaser likely does not assess the full useful life fuel savings, including uncertainty, when making purchase decisions. Rather, the original purchaser likely assesses the fuel savings for his/her ownership period plus the additional amount the second owner will pay for the higher fuel economy, both including uncertainty. Because of uncertainty, the original owner severely discounts what the second owner would be willing to pay for the higher fuel economy. If this discounted value is smaller than the value the subsequent owner would place on the fuel savings, including uncertainty, this creates a loss of welfare for the second owner.

University of Michigan Transportation Research Institute (UMTRI)

This section responds to interagency comments received prior to the publishing of the NPRM in the Federal Register. These interagency comments are contained in Document ID: EPA-HQ-OAR-2009-0472-0317.2: "Corporate Average Fuel Economy/Green House Gas (CAFE/GHG) Notice of Proposed Rule Making (NPRM) Summary of Interagency Comments under E. 0. (Executive Order) 12866". The interagency comments are in the form of a suggested rewrite of Section III.H of the "Proposed Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards". [OAR-2009-0472-3651.1, p.5]

The key paragraph contains the conceptual rationale for the suggested approach.

"The changes in welfare, holding constant vehicle purchases, turn on assumptions about consumers' private discount rate. Assuming perfectly competitive markets and perfect consumer foresight, standard economic theory suggests that in the absence of regulation, consumers currently make optimal trade-offs between the cost of purchasing a new vehicle and its subsequent operating costs (i.e., fuel expenditures, time spent refueling, and the benefits of additional driving). The assumption of perfect consumer foresight has of course run into serious theoretical and empirical objections in recent years, especially from behavioral economics. But it is important to see that on the stated assumption, no net private benefits accrue from the rule, since the regulation will change the purchase price of new cars and the stream of operating costs. The essence of this view is that in the absence of the regulation, consumers fully understand their current and future financial positions and optimally balance the trade-off between upfront costs and future operating costs. For this reason, CAFE or any other regulation that alters this trade-off must harm their private well being. This intuition behind this conclusion is best captured by the recognition that automobile companies currently sell vehicles that already comply with the standards set forth in this rule -- yet many consumers choose not to purchase these vehicles." [OAR-2009-0472-3651.1, p.6]

In evaluating proposed regulations, the benefits and costs of the regulation must be measured against a baseline. The above paragraph suggests that the baseline should be "perfectly competitive markets and perfect consumer foresight". However, according to the OMB's

guidelines for economic analysis of regulations, the baseline should be the "best assessment of the way the world would look absent the proposed regulation". Perfectly competitive markets and perfect consumer foresight do not describe the way the world looks today and are highly unlikely to describe the way the world would look in the future—with or without the proposed GHG emission standards. [OAR-2009-0472-3651.1, p.6]

Market failure can arise from externalities, market power, and inadequate or asymmetric information. The "market" for clean, fuel-efficient motor vehicles has all the necessary conditions for market failure. The most significant are inadequate information about the future and limitations in human rationality. Neither consumers nor automakers possess perfect foresight and rationality in making decisions. Calculations of welfare loss based on subjective consumer valuation are always problematic—they are difficult to estimate and difficult to justify. Using the perfect market populated by perfect producers and perfect consumers as the baseline against which gains and losses are assessed assumes that the status quo is the perfect market. [OAR-2009-0472-3651.1, p.6]

The OMB guidelines have it right—the baseline should be the way the real world would look absent the regulation. Adopting the approach in the suggested rewrite of section III.H would get it wrong. [OAR-2009-0472-3651.1, p.6]

In standard economic theory, a perfectly competitive market populated by consumers and firms with perfect foresight is, by definition, a world in which private welfare is maximized. Thus, any regulated change of product attributes or mix of products reduces private welfare. Setting the baseline as the perfectly competitive market populated by consumers and firms with perfect foresight, and then "concluding" that GHG emission regulations result in private welfare loss is an example of a rhetorical tautology. The conclusion is already present in the assumption. [OAR-2009-0472-3651.1, p.7]

The last sentence in the quoted paragraph reads, "This intuition behind this conclusion is best captured by the recognition that automobile companies currently sell vehicles that already comply with the standards set forth in this rule -- yet many consumers choose not to purchase these vehicles." The statement is misleading. Targets are set vehicle-by-vehicle based on footprint, however the standard must be met by each company. Thus, it is wrong to say that some vehicles already comply with the standards. [OAR-2009-0472-3651.1, p.7]

Let's assume that what was meant by the statement is that automobile companies currently sell some vehicles that are very fuel-efficient and clean, and that some consumers choose not to purchase these clean fuel-efficient vehicles. This is a true statement. However, the observed diversity in consumer purchases does not imply that CAFE necessarily harms private well-being. Since that conclusion is tautologically true if one assumes a perfectly competitive market with consumers and producers with perfect foresight, the observed diversity in consumer purchases is irrelevant. [OAR-2009-0472-3651.1, p.7]

[UMTRI also submitted these comments as testimony at the Detroit public hearing, See docket number EPA-HQ-OAR-2009-0472-6185, pp. 40-42.]

Consumer Federation of America

[Following is from [OAR-2009-0472-7272.1, p.42]

As discussed in Section II, the Notice barely scratches the surface of the debate over the "efficiency gap" and the policies to deal with it. The terminology applied to describe the failure of energy markets to achieve the level of energy efficiency one would expect from a theoretically efficient market has proliferated as concern over this problem has grown. The existence of this "efficiency gap" is explained with terms like barriers, obstacles, challenges, imperfections, and failures. These terms are often applied differently by different authors. When all is said and done, however, there is substantial consensus on the challenges energy efficiency faces.

To establish a framework for explaining the existence and magnitude of the market failure, as well as why fuel economy standards are an effective solution to the problem, this section reviews several literatures.

First, we review the discussion of the issue in the Notice of Proposed Rulemaking and its supporting documents. The agencies have invited comment on this issue.

Second, we briefly establish the basis for market failure analysis in the general economic literature. We start from traditional economic discussions and then move to more recent challenges to the traditional model in transaction cost and behavioral economics.

Third, we review the general "efficiency gap" literature. This literature was cited in the Notice and supporting documents.

Fourth, we review the "efficiency gap" literature as it relates directly to fuel economy and the importance of supply-side causes of market failure. This literature was also cited in the Notice and supporting documents.

Union of Concerned Scientists

Consumers also have not had perfect substitutes available in the market. The assertion that "fuel efficient cars are currently offered for sale, and consumers' purchasing decisions may suggest a preference for lower fuel economy than the proposed rule mandates" indicates a lack of knowledge about the actual vehicle offerings. For example, in minivans available for Model Year 2010, consumer fuel economy choices range from 18-20 mpg. To achieve higher fuel economy a consumer has one choice, a 23 mpg model that is smaller and less powerful than the others on the market. While a consumer choosing the 20 mpg model instead of the 23 mpg model does indicate that they place more value on the available size and performance than on the benefit of a 3 mpg increase, it does not imply that they would experience a welfare loss if they were given a 23 mpg vehicle with the same size and performance as the 20 mpg model. With the technology available to automakers, consumers will be able to purchase 2016 models with the same size and performance, and likely even better safety, than they have today while also saving money on fuel. [OAR-2009-0472-7181.1, pp.15-16]

Finally, the argument that consumers have an intuition that allows them to act as if they were operating in a perfect market is belied by the shifts in sales away from large SUVs that occurred as gas prices shot up in 2007 and 2008. Consumers, and manufacturers, were clearly unprepared for these changes and lacked the foresight and substitutes to maintain their welfare. If this intuition exists, it must be based on some unknown ability, as recent work by Kurani and Turentine indicates that consumers "do not have the basic building blocks of knowledge to make an economically rational decision." [OAR-2009-0472-7181.1, p.16]

James Adcock

The "Energy Paradox" Explained: Traditionally more expensive vehicles consume more fuel which corresponds to a generally marketing pattern of "conspicuous consumption" by more wealthy consumers - where consumers display their personal wealth and power through their display of overall consumption. High MPG vehicles such as a Prius turn this standard marketing paradigm on its head: now the wealthier consumer is paying to display their NON-consumption. Hollywood for example "Living with Ed" has been trying to sell the "less is cool" message for many years now. But then small high-MPG vehicles like the Prius conflict with the general marketing message of a Mfg which is "More is Better." This problem with mixed marketing messages coming from a Mfg was best represented by GMC having to decide whether to produce the EV 1 or the Hummer - GMC couldn't do both because of the oxymoron corporate marketing message involved. Likewise Toyota today falls under consumer pressure to stop manufacturing large trucks and become a "Purely Green" company.

We believe NHTSA continues to misunderstand the oil shock 1973 : It was high gas prices, NOT CAFE which lead consumers to downsize their choice of vehicles . Higher CAFE standards allow the consumer to be able to afford to buy a larger more safe vehicle than in the absence of CAFE. Consumer preference in vehicles HAS changed as indicated by Mfgs advertising MPG NOT HP in their TV ads . That offered MPG is not what consumers desire can be implied by the universal Mfg practice of touting HWY MPG NOT "Combined" MPG in their TV ads. The NHTSA discussion of consumer implied discounting rates cannot explain the success of the Prius . NHTSA needs to be able to explain this "anomaly" and also be able to explain the extremely high consumer satisfaction indices associated with Prius purchases. Recent refusals of consumers to buy large low MPG trucks would imply that it is NHTSA and the Mfgs who are not valuing MPG correctly - not consumers! NHTSA complains that consumers do not correctly value gas savings while allowing Mfgs to widely misrepresent the fuel efficiency of their vehicles, for example by broadcasting televisions ads which display HWY MPG as-if it were Combined MPG. The fact that Mfgs feel the need to misrepresent the MPG they are achieving demonstrates that consumers want higher fuel economy than Mfgs are providing. In the face of this CAFE can be seen as fulfilling an important consumer protection role against the misleading Mfgs Advertising.

"If . . . consumers have reliable information to estimate . . . future fuel savings." But consumers DO NOT have such "reliable information!" What consumers get is Mfg unreliable information in the way of TV ads that tout unrealistically high MPG while the unreadable fine print on the bottom of the screen says we are quoting HWY MPG not the more realistic COMBINED MPG."

So consumers believe they are buying higher MPG than they are actually getting because Mfgs are misrepresenting MPG in TV ads.

"Compromising Performance" is only a compromise to the extent that consumers WANT their "performance" measured on a "0 to 60" basis. To the extent consumers want their "performance" measured on an "MPG" basis then downsizing engines cost the Mfgs "Less than Nothing" - thus NHTSA standards based on an assumed "no change in performance" [meaning no change in "0 to 60"] are in fact being set too low - because at least some consumers measure "performance" on an MPG basis, not on a "0 to 60" basis.

New York University School of Law, Institute for Policy Integrity (IPI)
All other things equal, fully informed and perfectly rational consumers should be indifferent between a $1 increase in vehicle purchase price and a $1 savings in net present value of fuel costs. Yet a growing body of evidence suggests that consumers under-weigh costs that are less salient or accrue in the future, such as shipping and handles charges, management fees, sales tax, electricity, and fuel. One very recent study using a novel design and conservative assumptions found a significant average undervaluation of vehicle operating costs: consumers were willing to pay only 25 cents extra to reduce the net present value of expected gas costs by $1. [OAR-2009-0472-7232.3, p. 5]

This discrepancy—called the Energy Efficiency Paradox—can be depicted graphically [See OAR-2009-0472-7232.3, p. 5 for the graph.]. At a car's market price, some consumers will not buy, and others would actually be willing to pay more. [OAR-2009-0472-7232.3, p. 5]

The area between the demand curve and the market price—the "consumer surplus"—defines the value consumers attach to a good above its market price. Consumers will buy a car up the point where the purchase price plus the perceived operating costs equals their willingness to pay. However, if actual operating costs are much higher than perceived operating costs, consumers will buy more of this particular car model than they rationally should. Moreover, economic studies that look only at consumers' choices would overestimate consumer surplus and would therefore overestimate the lost consumer welfare from restricting the consumers' ability to select that particular model. [OAR-2009-0472-7232.3, p. 6]

Explanations for the Energy Efficiency Paradox will inform the appropriate regulatory response. NHTSA raises the possibility that no paradox exists: rather, consumers might be making a rational choice given uncertainty about future fuel prices and their vehicle's expected lifetime and usage. Consumers might compare the known, irreversible, upfront purchase price against an unknowable future stream of fuel savings, and choose to minimize the former. Regulations restricting such a choice would reduce consumer welfare. The current empirical evidence for such an explanation seems mixed at best: NHTSA should consider whether the evidence is sufficient to warrant adjusting its estimate of the Energy Efficiency Paradox, but overall support does not seem to justify a conclusion that no paradox exists. [OAR-2009-0472-7232.3, p. 6]

Another possible explanation is that consumers lack the necessary information to make a rational choice, do not fully appreciate the information presented, or are unable to translate information on fuel efficiency into expected fuel savings. This almost certainly is part of the problem, and the

agencies should continue efforts in the proposed rulemaking to improve the labeling and information available to consumers, especially in light of recent research demonstrating how mere differences in the presentation of numbers can alter consumer valuations. [OAR-2009-0472-7232.3, p. 6]

But even if consumers had full information, the Energy Efficiency Paradox might persist if consumers apply a high discount rate to operating costs or are especially averse to short□term loss. In such a case, there is a legitimate role for government regulation to encourage consumers to consider the long-term costs of car ownership. And, as explored more fully in the next section, government regulation may be necessary to correct market failures that lead consumers to make sub-optimal choices about fuel efficiency. [OAR-2009-0472-7232.3, p. 6]

EPA Response:

For this rule, EPA projects significant private gains to consumers in three major areas: (1) reductions in spending on fuel, (2) time saved due to less refueling, and (3) welfare gains from additional driving that results from the rebound effect. In combination, these private savings, mostly from fuel savings, appear to outweigh by a large margin the costs of the program, even without accounting for externalities.

Admittedly, these findings pose an economic conundrum. On the one hand, consumers are expected to gain significantly from the rules, as the increased cost of fuel efficient cars appears to be far smaller than the fuel savings. Yet these technologies are readily available; financially savvy consumers could have sought vehicles with improved fuel efficiency, and auto makers seeking those customers could have offered them. Assuming full information, perfect foresight, perfect competition, and financially rational consumers and producers, standard economic theory suggests that normal market operations would have provided the private net gains to consumers, and the only benefits of the rule would be due to external benefits. Assuming those conditions, if our analysis projects that there are net private benefits that consumers have not realized in this perfectly functioning market, then increased fuel economy should be accompanied by a corresponding loss in consumer welfare. This calculation assumes that consumers accurately predict and act on all the benefits they will get from a new vehicle, and that producers market products providing those benefits. The existence of large private net benefits from this rule, then, suggests either that the assumptions noted above do not hold, or that EPA's analysis has missed some factor(s) tied to improved fuel economy that reduce(s) consumer welfare. With respect to the latter, EPA believes the costs of the technologies developed for this rule take into account the cost needed to ensure that all vehicle qualities (including performance, reliability, and size) stay constant, except for fuel economy and vehicle price. As a result, there would need to be some other changed qualities that would reduce the benefits consumers receive from their vehicles. Changing circumstances (e.g., increased demand for horsepower in response to a drop in fuel prices), and any changes in vehicle attributes that manufacturers elect to make may result in additional private impacts to vehicle buyers from requiring increased fuel economy.

The central conundrum has been referred to as the Energy Paradox in this setting (and in several others).[52] In short, the problem is that consumers appear not to purchase products that are in their economic self-interest. There are strong theoretical reasons why this might be so.[53] Consumers might be myopic and hence undervalue the long-term; they might lack information or a full appreciation of information even when it is presented; they might be especially averse to the short-term losses associated with the higher prices of energy efficient products (the behavioral phenomenon of "loss aversion"); even if consumers have relevant knowledge, the benefits of energy efficient vehicles might not be sufficiently salient to them at the time of purchase; or, in the case of vehicle fuel efficiency, consumers may have relatively few choices to purchase vehicles with greater fuel economy once other characteristics, such as vehicle class, are chosen. A great deal of work in behavioral economics identifies factors of this sort, which help account for the Energy Paradox.[54] This point holds in the context of fuel savings (the main focus here), but it applies equally to the other private benefits, including reductions in refueling time and additional driving.[55]

Considerable research suggests that the Energy Paradox is real and significant due in part to consumers' inability to value future fuel savings appropriately. For example, Sanstad and Howarth (1994) argue that consumers optimize behavior without full information by resorting to imprecise but convenient rules of thumb. Consumers face difficulty in predicting the fuel savings that they are likely to get from a vehicle, for a number of reasons. For instance, the calculation of fuel savings is complex, and consumers may not make it correctly.[56] Larrick and Soll (2008) find evidence that consumers do not understand how to translate changes in miles-per-gallon into fuel savings (a concern that EPA is continuing to attempt to address).[57] In addition, future fuel price (a major component of fuel savings) is highly uncertain. Consumer fuel savings also vary across individuals, who travel different amounts and have different driving styles. Studies regularly show that fuel economy plays a role in consumers' vehicle purchases, but modeling that role may still be in development.[58]

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[52] Jaffe, A. B., and Stavins, R. N. (1994). The Energy Paradox and the Diffusion of Conservation Technology. Resource and Energy Economics, 16(2), 91-122. Docket EPA-HQ-OAR-2009-0472-11415.

[53] For an overview, see id.

[54] Jaffe, A. B., and Stavins, R. N. (1994). The Energy Paradox and the Diffusion of Conservation Technology. Resource and Energy Economics, 16(2), 91-122. Docket EPA-HQ-OAR-2009-0472-11415.

[55] For example, it might be maintained that, at the time of purchase, consumers take full account of the time spent refueling potentially saved by fuel-efficient cars, but it might also be questioned whether they have adequate information to do so, or whether that factor is sufficiently salient to play the proper role in purchasing decisions.

[56] Turrentine, T. and K. Kurani (2007). "Car Buyers and Fuel Economy?" Energy Policy 35: 1213-1223 (Docket EPA-HQ-OAR-2009-0472); Larrick, R. P., and J.B. Soll (2008). "The MPG illusion." *Science* 320: 1593-1594 (Docket EPA-HQ-OAR-2009-0472-0041).

[57] Sanstad, A., and R. Howarth (1994). "'Normal' Markets, Market Imperfections, and Energy Efficiency." Energy Policy 22(10): 811-818 (Docket EPA-HQ-OAR-2009-0472-11415); Larrick, R. P., and J.B. Soll (2008). "The MPG illusion." *Science* 320: 1593-1594 (Docket EPA-HQ-OAR-2009-0472-0043).

[58] Busse, Meghan R., Christopher R. Knittel, and Florian Zettelmeyer (2009). "Pain at the Pump: How Gasoline Prices Affect Automobile Purchasing in New and Used Markets," Working paper (accessed 6/30/09), available at http://www.econ.ucdavis.edu/faculty/knittel/papers/gaspaper_latest.pdf (Docket EPA-HQ-OAR-2009-0472-0044).

If there is a difference between fuel savings and consumers' willingness to pay for fuel savings, the next question is, which is the appropriate measure of consumer benefit? Fuel savings measure the actual monetary value that consumers will receive after purchasing a vehicle; the willingness to pay for fuel economy measures the value that, before a purchase, consumers place on additional fuel economy. As noted, there are a number of reasons that consumers may incorrectly estimate the benefits that they get from improved fuel economy, including risk or loss aversion, and poor ability to estimate savings. In addition, fuel economy may not be as salient as other vehicle characteristics when a consumer is considering vehicles. If these arguments are valid, then there will be significant gains to consumers of the government mandating additional fuel economy. The RIA, Chapter 8.1.2, includes further discussion of these phenomena.

EPA disagrees with the IPI's characterization of the Energy Efficiency Paradox. In the paradox, as discussed in EPA Preamble III.H.1 and RIA 8.1.2, consumers buy less fuel economy than the cost-effective level. As a result, there are consumer benefits that are left unrealized. Some economic models of the fuel economy market assume away the paradox, by adjusting the models to incorporate additional, undefined costs that lead to marginal benefits equaling marginal costs. In those models, any required increase in fuel economy must make consumers worse off, because they are already buying the cost-effective amount. If, however, the savings from improved fuel economy exceed the costs of the technology to provide it, then consumers can gain from fuel economy standards.

That said, EPA agrees that consumers may not make fuel economy decisions in ways that minimize their costs, and that "there is a legitimate role for government regulation" in this context.

Discount Rate for Fuel Savings

Organization: Natural Resources Defense Council

Comment:

Fuel Savings Should Be Valued Using a 3 Percent Discount Rate
When evaluating the private benefits of fuel savings to consumers, we support the EPA and NHTSA use of a 3 percent discount rate as a reasonable approach since it is consistent with OMB guidance and current DOE practice when evaluating benefits of energy savings from residential appliance standards. While we appreciate the richness of the agencies' discussions regarding the "energy paradox", the existence of high implicit or revealed consumer discount rates simply points to the need for strong standards to ensure consumers have access to investments in highly cost-effective fuel savings technologies. The appropriateness of government standards to help overcome market barriers to energy efficiency investments and necessary to meet national energy savings and environmental goals has been well established with decades of state and federal efficiency standards for appliances, buildings and vehicles. [OAR-2009-0472-7141.1, p. 23]

The use of a 3 percent to evaluate the consumer welfare benefits of fuel savings is fully consistent with guidance from OMB (Circular A-4) for evaluating net benefits in a regulatory analysis. The 3-percent rate is the average real rate of return on long-term government debt over the last 30 years. OMB Circular A-4 also permits the use of a 7 percent discount rate which is an estimate of the average before-tax rate of return to private capital in the U.S. economy. NRDC believes the lower end of the range is the most appropriate to use and has consistently argued for a discount rate of 3 percent or even lower when valuing the benefits of fuel savings. [OAR-2009-0472-7141.1, p. 24]

The use of the 3 and 7 percent discount rates is also the standard DOE practice for evaluating the electricity cost savings for residential appliances. The most recent example is the final rule adopted April 8, 2009 for dishwashers, dehumidifiers, microwave ovens, electric and gas kitchen ranges and ovens. In this final rule, DOE estimated the benefits and costs of the standards in the following manner:

The benefits and costs of today's final rule to the Nation can also be expressed in terms of annualized [2006$] values over the forecast period (2012 through 2042). Using a 7-percent discount rate for the annualized cost analysis, the cost of the standards established in today's final rule is $17 million per year in increased product and installation costs, while the annualized benefits are $37 million per year in reduced product operating costs. Using a 3-percent discount rate, the cost of the standards established in today's final rule is $28 million per year and the benefits are $85 million per year. [OAR-2009-0472-7141.1, p. 24]

The use of an "implicit" or "revealed" consumer discount rate is entirely inappropriate when evaluating policies that specifically address the very market barriers that create the high implicit discount rates. NRDC strongly disagrees with interagency comment number 34 that recommends evaluating consumer discount rates of 20 percent, 35 percent, and 50 percent. Such discount rates are inappropriate and inconsistent with previous rulemakings on consumer energy efficiency appliance standards by DOE and fuel economy standards by NHTSA. The 20 percent and higher discount rates represent an 'implicit' consumer discount rate that is a result of a number of market barriers to fuel efficiency, exactly which the proposed GHG and CAFE standards are well suited to overcoming. [OAR-2009-0472-7141.1, p. 24]

EPA Response:

EPA has used the standard 3% and 7% discount rates for its calculation of the benefits from fuel savings in Preamble Section III.H.4. EPA believes that whether consumers use high discount rates when they are buying a vehicle is a separate issue from the fuel savings that they will receive, and the discount rates associated with the money from the fuel savings.

Discount Rate Applied to Future Benefits

Organization: New York State Department of Transportation (NYSDOT)

Comment:

It is not clear if the same discount rate that is applied to future benefits is applied to future costs in the proposal. For example, several tables (e.g. Tables IV.G.4-10 through IV.G.4-14) present various cost and benefit values. The titles of these tables imply that a discount rate is applied equally to costs and benefits. However, the NPRM defines the discount rate as follows:

'The Reference Case uses a discount rate of 3 percent to discount future benefits.' Although the sensitivity analyses in the DEIS and NPRM indicate that the only economic factors of importance are industry compliance costs, the cost of fuel, and the magnitude of the rebound effect, the DEIS and NPRM should more clearly define how discount rates are applied to both costs and benefits. As noted in our comments to NHTSA dated September 8, 2008, discount rates should be applied to both benefits and costs. [OAR-2009-0472-7531.1, pp.2-3]

EPA Response:

For the final rule, EPA and NHTSA have used both a 3 percent and 7 percent discount rate to estimate the present value of costs, benefits and net benefits associated with the final rule. We have made it clear, both in the text and in the tables, which results are associated with a 3 percent discount rate and which are associated with a 7 percent discount rate.

Role of Benefit-Cost Analysis

Organization: University of Michigan Transportation Research Institute (UMTRI)
New York State Department of Transportation (NYSDOT)

Comment:

University of Michigan Transportation Research Institute (UMTRI)

Assuming perfectly competitive markets populated by consumers and producers with perfect foresight does allow economists to produce estimates of intangible, subjective costs and benefits that appear to be precise. Given the unrealistic assumptions required, the estimates are questionable. EPA should avoid treating estimates of intangible, subjective gains and losses as if they were tangible and objective. [OAR-2009-0472-3651.1, p.7]

Neoclassical welfare economic analysis is what is recommended in EPA-HQ-OAR-2009- 0472-0317.2: "Corporate Average Fuel Economy/Green House Gas (CAFE/GHG) Notice of Proposed Rule Making (NPRM) Summary of Interagency Comments under E. 0. (Executive Order) 12866". The foundations of neoclassical welfare economics consist of (1) the theory of the consumer as a rational utility maximizing agent, (2) the theory of the firm as a profit maximizing agent, (3) perfect foresight by both sets of agents, and (4) a perfectly competitive market. In recent years, empirical and conceptual contributions in consumer behavior and the theory of the firm have undermined these foundations. If the foundations give way, then the apparatus of neoclassical welfare economic analysis collapses. Benefit cost analysis (BCA) is then a dubious tool for policy judgments. [OAR-2009-0472-3651.1, p.7]

What should EPA and NHTSA use to replace benefit cost analysis (BCA)? An alternative tool derived from ecological economics is multi-criteria decision aide (MCDA). This approach to policy analysis takes a wide variety of relevant information into account, and is consistent with the multiple criteria that Congress has directed that EPA and NHTSA address in their rulemaking. The merits of MDCA compared to BCA are detailed in a 2005 paper by Gowdy and Erickson. [OAR-2009-0472-3651.1, pp.7-8] [[See Docket Number OAR-2009-0472-3651.1, p.8 for a table that outlines their comparison.]]

[[UMTRI also submitted these comments as testimony at the Detroit public hearing, See docket number EPA-HQ-OAR-2009-0472-6185, pp. 40-42.]

New York State Department of Transportation (NYSDOT)

The proposal does not appear to give due consideration to the economic benefits of improved fuel economy at the consumer level. It is not reasonable to assume that the only effect of fuel-costs savings will be a rebound effect. The only economic benefit that appears to be considered in the impact analysis is a $0.17/gallon benefit from reducing oil imports. Unfortunately, this anticipated benefit is difficult to comprehend since the DEIS indicates that fuel consumption will increase significantly in the future whether or not the proposed CAFE standards are implemented. [OAR-2009-0472-7531.1, p.3]

EPA Response:

EPA disagrees that benefit-cost analysis is "a dubious tool" in this framework. Benefit-cost analysis can be (and has been) used in situations where not all of the assumptions listed above hold: for instance, it can be used to measure the effects of imperfect competition. EPA's assessment of the benefits and costs is in Preamble Section III.H. Because we believe that benefit-cost analysis is an appropriate evaluation tool, we have chosen not to use multi-criteria decision aid for this rule.

EPA considers a wide range of economic impacts associated with the final rule. For reference, Chapter 8.4 of EPA's RIA and Section III.H.10 of the preamble present a summary of costs, benefits, and net benefits of the rule. The net benefits of EPA's final program consist of the effects of the program on:

- the vehicle program costs (costs of complying with the vehicle CO_2 standards, taking into account FFV credits through 2015, the temporary lead-time alternative allowance standard program (TLAASP), full car/truck trading, and the A/C credit program, and other flexibilities built into the final program),
- fuel savings associated with reduced fuel usage resulting from the program,
- greenhouse gas emissions,
- noise, congestion, accidents,
- other pollutants,
- energy security impacts,
- reduced refueling events, and
- increased driving due to the "rebound" effect.

Imperfect Competition

Organization: James Adcock

In general consumers with differing projections of the "true" future cost of SCC and fuel prices will make differing estimates of the utility of the purchase of a particular vehicle. Analysis that assumes one particular "US-wide" value of SCC or fuel costs will thus reach erroneous conclusions about vehicles Mfgs should be offering consumers – consumers hold a wide variety of beliefs on these subjects and thus Mfgs should, if "free market" forces are at work [which they aren't, due to huge barriers to entry into the Auto Industry -- due in part to NHTSA regulations] provide a wide variety of fuel efficiency vehicles to consumers. But the market doesn't actually work that way. For example Toyotas' great success with the Prius makes it LESS likely not more that other Mfgs will attempt to compete in that segment of the market.

NHTSA assumes that citizen do not understand the cost benefits of higher fuel efficiency but ignores the fact that the vehicle market is not a "perfect market" and Mfgs may not be offering the fuel efficiency vehicles that consumers want. Further, NHTSA regulations and "Grey Market" import restrictions work to make the market even less perfect, since many high fuel efficiency vehicles available overseas are not available to the US citizen.

Contrary to NHTSA statements the US does not in practice represent a "competitive free market" environment compared to the EC market say Great Britain where the consumer has several times as many model choices to choose from. On a stringency adjusted basis EU and Japan fuel economy standards still remains approx . 2X as strict as the US . NHTSA needs to clearly explain why the US is not competitive in being able to offer similar environmental benefits here . "Consumer perfect knowledge leads to informed choice" - this cannot happen if the Mfgs do not in fact provide the option of cars with MPG equal to what consumers want. Consumers cannot buy the car they want in part because NHTSA "Grey Market Laws" prevent importation of most high fuel efficient vehicles built worldwide. In a "perfect market" such barriers do not exist, rather the choice is left to the consumer . Further, the US Auto Market has huge barriers to entry for new competitors due in part to the differences between world EC regulations vs . US specific DOT regulations, and the huge cost of crash testing.

EPA Response:

As discussed in RIA Section 8.1, it is possible that market imperfections on the part of the auto makers may contribute to the existence of the “energy gap.”

Policies influencing consumer purchasing attitudes

Organization:
Michael T. Schade
James Adcock

Comment:

Michael T. Schade

The Energy Paradox presented and discussed several times in the rule is likely among the most important issues in achieving the national fuel consumption and CO2 emission reduction targets. Especially of concern to me is how to encourage a greater public desire for more highly fuel efficient and lower CO2 emitting vehicles. I'm not talking about someone buying a more fuel efficient SUV that will be enabled by this rule but encouraging them to consider trading down to a model that is smaller and even more fuel efficient. Several episodes of oil shortages and oil driven price swings during the 1970's and the price spike 2 years ago demonstrate the transitory nature of purchase decision that place a high value on fuel efficiency. The European experience of continually very high fuel taxes forcing high motor fuel prices and leading to a high priority given to fuel economy in vehicle purchase decisions is demonstrated every day in the nature of the European vehicle fleet composition. Sales estimate premises are now much more transparent than using confidential manufacturer input. But their accuracy is still vulnerable to major dislocations due to customer buying preferences that may abruptly (either on a temporary basis or more permanently) change with fuel price spikes and troughs. This may be the weakest link in the whole current approach in reducing motor fuel consumption by forcing incremental vehicle improvements. The absolute minimum backstop concept partially deals with this risk but only for the domestic automobile fleet and not for imported cars nor for trucks in total. My only recommendation is a predictable and well understood ramping up of motor fuel taxes to a level that will change consumer behavior and create pull through demand for much more efficient vehicles. Preferably, these tax increases would be offset by equivalent tax cuts in other areas. But I understand that much higher gasoline/diesel federal taxes are not now politically achievable so I'd recommend including in this rule a transparent and honest discussion of the risk of not adopting policy targeted towards influencing desired consumer purchasing attitudes. [OAR-2009-0472-7261.1, pp.3-4]

James Adcock:

Lowering the size and weight of vehicles doesn't cause the consumer to buy these smaller vehicles . Rather, the consumer buys smaller vehicles to optimize the total cost of ownership to their financial situation given higher gas prices . We do not believe either tiny vehicles such as Smart or giant vehicles such as Escalade are in the broader public interest of safety nor reasonable fuel economy tradeoffs . CAFE and crash test standards should be developed in a way that makes clear that such extreme size "outliers" are not good consumer choices.

We believe it can be a rational choice on the part of the consumer in terms of morality to risk personal safety by buying a smaller car which is less destructive to the planet and the human race, even while climate change deniers – aggressive drivers - buy aggressive design "Monster Trucks."

We believe it is morally unacceptable in modern society, that a consumer be allowed to buy, and a Mfg be allowed to make, a vehicle KNOWN to have low MPG AND which represents a high fatality risk to the occupants of other vehicles – aka "Aggressive Design ." That NHTSA

continues to allow this represents a failure to rationally regulate the market for either safety or for fuel economy.

EPA Response:

Consumers have different tastes, and choose different combinations of vehicle characteristics. EPA seeks to reduce GHG emissions vehicles while maintaining the quality and variety of vehicles. Consumers have many factors in mind when they choose the vehicles that they buy; switching to a smaller and even more fuel efficient vehicle may not be possible for everyone.

EPA agrees that vehicle sales estimates are not precise due to factors such as those that the commenter mentions. A gasoline/diesel fuel tax is outside the scope of this rule.

EPA's analysis of this rule includes discussion of its impacts in a number of areas, including among others consumer welfare, energy security, climate, other air pollutants, accidents, noise, congestion. Because the baseline is our estimate of the world without the rule, then the effects of not adopting this policy are the negative of the effects of the rule, reported in the rulemaking documents.

5.13.2. Costs Associated with the Vehicle Program

Organization: California Air Resources Board

Comment:

We agree with NHTSA that the incremental increases in average new vehicle costs can be mostly or wholly passed through to consumers, and for this reason also agree with EPA's related assumption that cost increases of this magnitude will not create a fleet turnover issue. Due to the concurrent improvements in fuel efficiency (and lower emissions), the higher vehicle purchase price can be offset by the fuel savings within the typical ownership period of the first owner. Reduced operating costs could make these new vehicles more attractive to consumers who expect fuel prices to remain high or continue to rise. For this reason and based on previous CARB analyses for the Pavley GHG rulemaking, we do not believe that the increased vehicle prices will significantly deter consumers from making new vehicle purchases. In fact, our analysis showed that in early years, new sales would increase slightly as a result of the regulation. Thus, like EPA and NHTSA we believe delayed scrappage or fleet turnover issues should not be a serious concern at the cost levels currently anticipated. [OAR-2009-0472-7189.1, p.9]

[CARB also submitted these comments as testimony at the Los Angeles public hearing. See docket number OAR-2009-0472-7283, pp. 21-27]

EPA Response:

We agree with the comment submitted by CARB that the new GHG standards should not create a fleet turnover or delayed scrappage issue. We also agree that the increased cost of compliant

vehicles can and will be quickly offset by the savings from reduced fuel consumption. We present our "impact on vehicle sales" discussion and our "payback analysis" in section III.H of the preamble and in Chapter 8 of the RIA.

Organization: University of Michigan Transportation Research Institute (UMTRI)

Comment:

Section III.H.2 of the "Proposed Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards" is concerned with "Costs Associated with the Vehicle Program." My comments are in support of the indirect cost multipliers (ICM) used by EPA to account for indirect costs. As a subcontractor to RTI, I assisted EPA in developing the methodology used to estimate indirect cost multipliers and retail price equivalent multipliers (RPE). [OAR-2009-0472-3651.1, p.4]

The costs to automakers of complying with the proposed regulations should be defined to include only those costs that change due to the regulations. When compliance necessitates adding equipment to the vehicle, the compliance costs include direct manufacturing costs associated with new technology (materials and direct production labor) plus the change in those indirect cost items that are affected (e.g., engineering development cost). [OAR-2009-0472-3651.1, p.4]

In most cases, direct costs can be estimated without difficulty or controversy. However, indirect costs are more difficult to estimate and have been the subject of considerable controversy. The methodology guides EPA analysts in identifying indirect costs that are likely to be affected by regulations. The methodology is supported by estimates of RPE and ICM for several automakers that we derived from recent annual financial reports and other public data. [OAR-2009-0472-3651.1, p.4]

The EPA uses a range of indirect cost multipliers (ICM), depending on the timing of the application of the regulation and the complexity of the technology that is anticipated to be necessary. The multipliers range from 1.11 to 1.64 in the short term and from 1.07 to 1.39 in the long term. In the ICM, the numerator is direct plus indirect cost and the denominator is direct cost. The ICM covers direct and indirect costs only; no provision for profits is made. However, the RPE adds profit to the numerator, so the RPE is greater than the ICM. It has been argued that regulatory agencies should use an RPE that is greater than 2.0, which would imply an ICM of 1.90 or higher (assuming a 5 percent profit computed on sales—2.00 X .05 = .10; 2.00 - .10 = 1.90). [OAR-2009-0472-3651.1, p.4]

How reasonable is an RPE of 2.00 or higher? To answer this question, consider GMs financial results for 2004-08, shown in Table 1. [OAR-2009-0472-3651.1, p.4]

GM is an easy case to study, because it provides information in its annual reports on contribution costs in addition to the standard GAAP information on cost of sales. Contribution costs are closer to direct costs than are cost of sales. [OAR-2009-0472-3651.1, p.4]

In its annual reports, GM says it considers contribution cost to be costs that vary directly with production. They consist of material cost, freight, and policy and warranty expenses. There are two differences between GM's contribution costs and the EPA's definition of direct costs. GM explicitly excludes direct production labor from contribution costs, whereas the EPA's definition of direct costs includes direct production labor. GM includes freight and warranty in contribution costs, which the EPA treats as indirect costs. GM does not report its direct production labor costs, but we estimate them to be about $9 per year. GM reported warranty and freight costs of $9.7 billion in 2007. Thus, these two expense categories roughly offset each other, meaning that, for GM, direct costs are roughly the same as contribution costs. [OAR-2009-0472-3651.1, pp.4-5]

Since GM had losses in each of these years, we also computed hypothetical RPE multipliers that would result if GM had the same cost structure but earned a 5 percent profit. These hypothetical RPE multipliers are 1.50 to 1.58. In either the actual or the hypothetical case, the RPE multipliers are substantially lower than 2.00. [OAR-2009-0472-3651.1, p.5]

The indirect cost multipliers that EPA uses in the preliminary rule give sensible and fact-based guidance on how indirect costs ought to be estimated. [OAR-2009-0472-3651.1, p.5]

[[UMTRI also submitted these comments as testimony at the Detroit public hearing, See docket number EPA-HQ-OAR-2009-0472-6185, pp. 37-40.]

EPA Response:

The Agency appreciates these comments and agrees with them.

Organization: Chew, Yuli

Comment:

I support the assumption of 4% for the cost and effectiveness estimates for the diesel engine and after treatment system; however, I think a higher improvement rate may be attainable considering the fact that the proportion of diesel will jump to 4% and 10% of the cars and trucks respectively. In Model Year 2011, diesel technologies for truck technology classes were allowed to be applied at a 4 percent combined (for DSLT and DSLC) phase-in cap for MY 2011 to account for the higher application rates observed in the submitted product plans and diesel's favorable characteristics in truck applications. [OAR-2009-0472-7042.1, p.2]

As to whether EPA should use a 4% or 6% per year increase in standards, I feel that a 6.0% is closer to what is specified in the CARB Regulation. This will helps to achieve a fleet average of 36.9 mpg or 241 g/mi of CO2 equivalent in 2016. This is more closely related to CARB's target of achieving 43.4 mpg for cars and 26.8 mpg for trucks, or 205 g/mi for cars and 332 g/mi of trucks in 2016. [OAR-2009-0472-7042.1, p.2]

EPA Response:

EPA believes that diesel technology has a role in the future light-duty fleet. Although the modeling we have done using the OMEGA model has not shown a move from gasoline technology to diesel technology, that does not mean that EPA is prohibiting such an outcome. The rule allows manufacturers to comply with their respective fleet average standards using any technology they choose to utilize. EPA continues to believe that the cost estimates and effectiveness estimates used in the proposal are appropriate for the final rule.

Regarding the 4% or 6% per year increases in standards, the commenter states a belief that the 6% per year alternative would be more representative of the CARB regulation (*i.e.*, Pavley I levels). As EPA's analysis shows (see Chapter 3 of the RIA), the national GHG standard results in vehicle sales in California of federally compliant vehicles that have fleet average GHG emissions equal to the fleet average that would be achieved under the California program In their comments on the proposal, the California Air Resources Board agreed that the standards presented in this rulemaking align with California's Pavley greenhouse gas emissions standards, and ultimately arrive at the same stringency as California's standards in MY 2016.

Organization: Chew, Yuli; State of New Jersey

Comment:

For the cost estimates for the various hybrid systems, NHTSA use a figure of $320 per KW-hr for 2012 -2016 as compared to $600 per Kw-hr for 2011 Model Year. I feel that a lower figure of about $260 per KW-hr should be more reasonable. See page 47 of Report of the ARB Independent Expert Panel 2007 prepared for State of California Air Resources Board. http://www.arb.ca.gov/msprog/zevprog/zevreview/zev_panel_report.pdf Similar to the price of solar panels, the price dropped drastically if they are mass produced. [OAR-2009-0472-7042.1, p.2; OAR-2009-0472-7109.1, p.9]

EPA Response:

We disagree that a $260 per kW-hr is a more appropriate cost than the $320 figure used given the timeframe of analysis. Our $320 figure is based on current (2012 timeframe) best estimates of around $500 per kW-hr and application of manufacturer learning to arrive at an estimated $320 figure in the 2015/2016 timeframe. Note that the Report of the ARB Independent Expert Panel 2007 showed $/kW-hr ranges of $340-420/kW-hr for an annual production of 20,000 batteries per year to $240-280/kW-hr for 100,000 batteries per year. No timeframe is provided for these ranges. It is not known currently what level of electric vehicle sales (and, hence, what level of battery production) will occur within the regulatory timeframe. The agencies do know that the new standards will not force introduction of electric vehicles. Hence, the $500/kW-hr in 2012 and $320/kW-hr in 2015 estimates used are not inconsistent with the estimates of the ARB Expert Panel. Therefore, we continue to believe that the estimates we used in the proposal are acceptable for the final rule, especially in light of the very low penetration of technologies dependent on electrification of motive power (i.e., hybrids, electric vehicles, plug-ins).

Organization: Devon Energy Corporation; Donald F. Shaw; C. M. Spurgeon; Neil Stanton

Comment:

The proposed regulations will harm our economy. A few years ago, the National Highway Safety Administration (NHTSA) estimated that increasing fuel economy standards to 35 miles per gallon by 2020 would cost the car companies $114 billion. (See Detroit News, "Fuel Plan Would Cost Big Three" (March 1, 2007). Inexplicably, today NHTSA claims that achieving the 35 miles per gallon fleetwide standard by 2016, four years earlier, would cost only $60 billion. (75 Fed. Reg. 49479). This change from NHTSA is not credible. The cost of technology-forcing regulations do not decrease by half as a result of companies only having half the time to comply with the regulations. [OAR-2009-0472-10450, p.1; OAR-2009-0472-7270.1, p. 3; OAR-2009-0472-7270.1, p. 3; OAR-2009-0472-10169, p.2]

EPA and NHTSA's plan will increase costs for car companies and further reduce auto company jobs. Higher priced cars and trucks will make life more difficult for American families who need affordable transportation options. [OAR-2009-0472-10450, p.1; OAR-2009-0472-7270.1, p. 3; OAR-2009-0472-7270.1, p. 3; OAR-2009-0472-10169, p.2]

EPA Response:

We disagree that the regulations will harm our economy. In fact, we believe that the new standards will help our economy by saving consumers and businesses money currently spent on fuel which can then be spent on other items or invested in ways that boost our economy. The standards will also benefit the economy by increasing our energy security and reducing our reliance on foreign oil. As for cost estimates and the changes between the 2011 rule and this rule, it is difficult to address this comment given that the commenter does not question specific cost estimates. That being said, it is important to note the difficulty associated with cost estimation and the ongoing effort made by both EPA and NHTSA to use the best available cost information at any given time. Since publication of the 2011 final rule, both agencies have sought to continually improve cost estimates – more thorough consideration given to future product planning when adding technology in intermediate years, better cost estimation through FEV tear down studies like those conducted by FEV under EPA contract, application of learning curve effects to more closely estimate cost reductions over time -- which have resulted in many cost estimates being lowered. NHTSA and EPA would be remiss not to revise cost estimates in light of newer, better information, whether that information increases or decreases those estimates. Note also that the auto makers did not challenge the newer cost estimates to any significant degree.

Regarding reducing auto company jobs and making life more difficult for American families, again both agencies disagree. Instead, we believe that the new standards provide American families with more affordable transportation options since the fuel savings associated with the new standards quickly offset increased new vehicle costs (within the first month for a vehicle purchased via a typical 5 year loan – see sections III.H.5 and IV of the preamble for more detail). These savings are expected to increase vehicle sales relative to sales without the new standards (again see sections III.H.5 and IV of the preamble for more detail) which, in turn, would be expected to increase rather than decrease auto maker jobs.

Organization: Dillard, Joyce

Comment:

In the end, the greenhouse gas emission changes are about a financial system. It affects the daily lives of citizens and impacts their income and economic capabilities. [OAR-2009-0472-7226.1, p. 2]

In Los Angeles, California we have Port of Los Angeles truck drivers feeling the pinch of the new monopoly over the greenhouse gas reductions. The free market has been diminished for more bureaucracy and finite control without the proper regulatory process. [OAR-2009-0472-7226.1, p. 2]

EPA Response:

EPA agrees that the daily lives of citizens are impacted by greenhouse gas emissions, and that the joint rulemaking for a national program to control greenhouse gases and fuel economy from light-duty vehicles will impact citizens. A closer look at the comments submitted by the commenter suggests that the commenter appears to be commenting on two topics: public availability of information on greenhouse gas impacts ("What is needed is a Clearinghouse for the Depository of Scientific and Factual Data as a springboard for industry, individuals, students, parents and children to buy into their future. Access to correct information is a key factor for future results to any environmental issue. Peer-reviewed information is necessary." (see page 1)); and cap and trade proposals ("In California, the State Legislature has passed AB 32 California Global Warming Solutions Act of 2006 for the reduction of greenhouse gases and the implementation of Cap and Trade, a tax. The State of California Natural Resources Agency is processing the CEQA Rulemaking for SB 97 Greenhouse Gas Emissions, a related bill, which will implement the CEQA California Environmental Quality Act for this process. The Cap and Trade tax is under the purview of a regional entity-Western Climate Initiative WCI, an unelected body, in a non-transparent process. We have no benefit of financial forecasting, at this point, and no basis for financial responsibility." (see page 1)).

As regards the former issue, the agencies have made every effort to be as transparent as possible in developing the standards being put into place. That information is, primarily, supportive of the standards being set rather than being scientific information surrounding the impact of greenhouse gases on climate change. The agencies have been tasked with creating a national program to address greenhouse gas emissions and fuel eonomy, not to determine the impact of greenhouse gases on climate change.

As regards the latter comment -- regarding cap and trade proposals -- the issue is not germaine to the joint rulemakings as cap and trade is not part of either EPA's or NHTSA's programs.

Organization: Brooks, Dawn

Comment:

I am concerned the costs of the new technology required to produce lower emissions are inaccurate and will be passed onto me, the consumer. According to the report, Proposed Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards (2009), the average incremental cost of the program is $1,409.00, and is even higher for light trucks at $1,641.00 (p.253). The increased cost is a result of the new emission standards forcing "manufacturers to apply considerable additional technology" (Proposed Rulemaking To Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards, 2009, p. 253). This plan merely guesses on how manufactures are going to implement the proposed policy as the report also states, "NHTSA cannot predict how manufacturers will respond to the proposed standards" (Proposed Rulemaking To Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards, 2009, p. 253). If the agencies involved do not understand what procedures and technology the automobile manufacturers will use to implement the requirements of the program, how can the agencies assess an accurate dollar amount for incremental costs?

Furthermore, the projected costs do not include higher sales taxes, insurance increases, and other incidental fees resulting from more expensive vehicles. Maintenance costs will increase adding even more burdens to the consumer as the technology will be more complicated and time consuming for mechanics to repair. Consequently, incremental projected increased costs do not simply include the new technology added by the automobile manufacturers as stated in the report.

The costs of this program, along with the associated costs added to a higher priced, more environmentally friendly vehicle will substantially increase consumer expenses for transportation.

I respectfully request the agency take a more thorough look at projected costs of this proposed program. I understand the benefits; now make me understand the true costs. Do not pass proposed rule EPA-HQ-OAR-2009-0472 until the automobile manufacturers present their added costs to the redesigned vehicles to fulfill the 2016 lower emissions and increased fuel efficiency standards. Manufacturer figures will give the agency a more comprehensive understanding of costs to the consumer as a result of these new regulations. [EPA-HQ-OAR-2009-0472-3851, pp 1-2]

EPA Response:

EPA cannot predict what level of costs will be passed on to consumers through increased vehicle prices. EPA does not doubt that some and perhaps all of the costs will in fact be passed on. However, EPA doubts that price increases will occur equally on all vehicles as auto makers will determine which vehicles can best absorb increased prices and which cannot. Importantly, the costs mentioned by the commenter are not the actual cost estimates associated with the proposal. Those mentioned are from sensitivity analyses conducted by NHTSA looking at the costs associated with a 5%/year increase in fuel economy. The proposal actually called for a 4%/year increase in fuel economy and, therefore, estimated lower costs ($1,020 and $1,127 for trucks and

cars, respectively) than the 5%/year increase. Further, the estimates for the final rule are lower than those for the proposal.

Regarding the agencies' abilities to estimate costs given a "lack of understanding" over what auto manufacturers will use to comply with the regulations, EPA disagrees with this comment. In fact, the agency understands very well the technologies at manufacturer's disposal to meet the regulations. However, there are so many different technologies that can be used ranging from engine friction reductions to improved valve train designs to turbocharging with engine downsizing to more efficient fuel systems to new transmissions to hybridization, etc., that it is impossible to know for sure what will be done short of mandating what will be done. Neither EPA nor NHTSA wish to mandate a solution to improving fuel efficiency. Instead, auto manufacturers will consider all the options and how best to satisfy their customers in making their own determination. That said, both agencies have made use of rigorous engineering analysis to estimate future technology mixes in making our best estimates of future technology costs.

Regarding higher sales taxes and insurance costs on new vehicles, the comment is accurate that such costs have not been considered in the formal cost estimates (they have been considered in our estimates of consumer payback). We have included costs associated with higher warranty expenditures through our indirect cost multipliers but have not included costs associated with increased maintenance. Importantly, we do not know that net maintenance costs for consumers will increase or decrease. With respect to the A/C program, we believe that maintenance costs will decrease since leakage should be largely eliminated.

Regarding the rule resulting in increased expenses for transportation, again EPA disagrees. Please refer to our payback analysis which shows that fuel savings will outweigh up front costs within three years for people purchasing new vehicles with cash. For those purchasing new vehicles with a typical five-year car note, the fuel savings will outweigh increased costs in the first month of ownership.

Regarding the request that EPA wait until auto manufacturers have presented their cost estimates, the Agency has given the auto makers an opportunity to respond to its cost estimates and, while some auto makers submitted comments on some aspects of the cost estimates, the auto makers have not challenged them in any meaningful way. Therefore, EPA believes that the cost estimates for the final rule are the best available estimates at this time.

Organization: American Council for an Energy Efficient Economy

Comment:

The agencies also worry that their technology cost estimates may be too low (TSD 4-2). Accuracy of cost estimates is a legitimate concern in a wide array of rulemakings but is best handled through a sensitivity analysis. It should not be used to impugn the validity of the proposed standards.

EPA Response:

As noted in the previous response, EPA has given the auto makers an opportunity to respond to its cost estimates and, while some auto makers submitted comments on some aspects of the cost estimates, the auto makers have not challenged them in any meaningful way. Therefore, EPA believes that the cost estimates for the final rule are the best available estimates at this time.

5.13.4. Reduction in Fuel Consumption and its Impacts

Organization: Competitive Enterprise Institute

Comment:

II. The proposed standards will increase the risk of death and injury related to auto accidents. GHG standards are fuel economy standards. The proposed GHG standard is just a fuel economy standard by another name. EPA comes very close to acknowledging as much, explaining that the rule aims to reduce emissions by increasing fuel economy: [[commenter quotes EPA on OAR-2009-0472-7281.1 p.3]] The only difference between EPA's proposed rule and a 100% "pure" fuel economy standard is that the rule seeks to reduce leakage of air conditioning-refrigerant GHGs. However, the rule also seeks to reduce "the consumption of fuel to provide power to the A/C system." So even with respect to vehicular air conditioning systems, EPA's proposal targets fuel economy. As the rule states, 95% of all GHGs emitted by light duty vehicle are CO2 emissions, and "the only way at present to reduce tailpipe emissions of CO2 is by reducing fuel consumption. [OAR-2009-0472-7281.1, p.2]

EPA Response:

We disagree that the standards will increase the risk of death and injury related to auto accidents. Please refer to the preamble section II.G and EPA's RIA section 7.6 for more detail on this issue.

There are two aspects to the A/C program: reduced refrigerant loss through improved system design (direct GHG reductions); and reduced power consumption to operate the A/C system (indirect GHG reductions). The latter of these results in reduced CO2 emissions since less fuel is consumed to power the A/C system. The former -- reduced refrigerant loss – results in reductions in far more potent greenhouse gases. EPA does not disagree that the new GHG tailpipe standards are, in effect, new fuel economy standards given that the only way at present to reduce tailpipe emissions of CO2 is by reducing fuel consumption. That does not alter the fact the greenhouse gases are pollutants under the CAA, and that, having made the findings that emissions of these pollutants may endanger public health and welfare and that emissions of these pollutants from new motor vehicles causes or contributes to that endangerment, EPA has a mandatory legal duty to promulgate emission standards for those vehicles under section 202 (a)(1). State of Massachusetts v. EPA, 549 U.S. at 533. For the same reason, it is legally irrelevant that CAFE standards directly regulate vehicular fuel economy. Id. at 531-32._The agencies have chosen to discharge their respective responsibilities in this joint rulemaking so that a National Program can be established to the benefit of all stakeholders. See id. at 532 ("But that DOT sets mileage standards in no way licenses EPA to shirk its environmental responsibilities

… The two obligations may overlap, but there is no reason to think the two agencies cannot both administer their obligations and yet avoid inconsistency").

Organization: Consumer Federation of America

Comment:

[[These comments were submitted as testimony at the Detroit public hearing. See docket number OAR-2009-0472-6185, pp. 106-107.]]

In particular, EPA and NHTSA should balance the three goals in the underlying statutes of technical feasibility, economic practicability, and the need to conserve energy, and the statutes really are in agreement here, by setting the standard at the mid point of the range between maximum economic benefit and maximum practicable environmental benefit.

In addition, they should recognize the higher resale value of more fuel efficient vehicles. They should properly value fuel savings by removing the rebound effect from the consumer private welfare analysis and setting it at a lower level in the societal analysis. Rebound has no business in the private valuation.

They should recognize consumer willingness to change their demand for vehicle attributes. The American consumer has shown they are willing to change.

They should assign significant national security value to reducing oil consumption.

EPA Response:

Our rulemaking recognizes consumer willingness to change their demand for vehicle attributes. Should enough consumers demand any given attribute, then presumably a manufacturer(s) will step forward to provide it. The rules, however, do not mandate vehicle attributes from the supply-side. Manufacturers may achieve their respective standards by any means they choose. We have made every effort to ensure that consumers will continue to find the attributes they currently demand within the future fleet all while consuming less fuel. EPA did this by building technology packages for each vehicle type (refer to Chapter 1 of EPA's RIA) that maintained in the judgment of staff engineers the key performance characteristic (zero to 60 mph acceleration). Each subsequent package generally costs more, provides greater fuel efficiency, and maintains performance relative to the package before it and, hence, the baseline or current vehicle. Should consumers demand more from manufacturers -- that is, vehicles that consume even less fuel at the expense of some vehicle attributes -- then some manufacturers may well deliver those vehicles. This would be a demand-side driven outcome.

We have assigned considerable national security value to reducing oil consumption. Please refer to our analysis as presented in section III.H of the preamble and Chapter 8 of the RIA.

Lastly, EPA disagrees with the comment that rebound mileage should be set lower or even removed from the fuel savings analysis. Many historical studies have shown a correlation

between changes in total VMT and changes in fuel economy, even when other factors such as gasoline prices are taken into account. As we described in section II of the joint preamble and Chapter 4 of the joint TSD, recent literature suggests that the rebound effect is 10% or lower, whereas the larger body of historical studies suggests a higher rebound effect. Therefore, we believe a rebound effect of 10% is appropriate for this rulemaking.

Organization: National Automobile Dealers Association (NADA)

Comment:

In the National Program proposal, NHTSA may have inappropriately shifted from its historically justified 15-30 percent rebound effect range to a proposed 10 percent. While some justification may be found to support moving toward the lower end of the historical range, 10 percent does not appear to be adequately justified. [OAR-2009-0472-7182.1, p.11]

EPA Response:

EPA and NHTSA disagree with the commenter that we did not justify our rationale for shifting our quantified estimate of a rebound effect to 10 percent. As described in detail in the Joint TSD Chapter 4, a summary of the existing literature indicates that a majority of the studies estimated that the historical value for the rebound effect is between 10 and 30 percent. Furthermore, newer research using more recent data suggest that the rebound effect is declining over time and will continue to decline in the future, particularly when future projections of income, gasoline prices, and urbanization are taken into account. Based on this body of evidence, we believe there is adequate justification to support reducing the rebound effect to 10 percent for this rulemaking.

Organization: National Automobile Dealers Association (NADA)

Comment:

The National Program proposal is being developed during one of the most significant economic turndowns in the history of the auto industry. Manufacturers and dealers alike are continuing to experience dire and volatile economic impacts. Where just two years ago new vehicles were being sold in the U.S. at an annualized rate of over 16 million units, today that rate has fallen to an estimated 10.2 million. In that same short time frame, thousands of new car dealers have gone out of business and overall dealership employment has dropped by some 100,000 and 200,000. Two large domestic automakers and their dealers owe their very existence to massive federal government intervention. New competition is expected soon from China, from India, and even from new domestic startups. Competition is good and dealers look forward to selling those vehicles. However, NHTSA and EPA must recognize and fully account for these economic and competitive realities when finalizing the National Program to ensure that, to the greatest extent possible, dealership employment and viability is protected. [OAR-2009-0472-7182.1, p.4]

Regarding vehicle affordability, the critical importance of fuel price and availability cannot be overstated. New vehicle purchasers typically aren't early adaptors of high priced new technologies, nor are they so well off as to ignore fuel efficiency even when fuel prices are high.

Instead, the vast majority of new vehicle purchasers are payment buyers with multi-year loans who only become keenly interested in fuel economy when fuel prices skyrocket. Clearly, it is very difficult to forecast fuel prices in a free market. By relying on conservative fuel price forecast assumptions, the National Program will at worse achieve better fuel economy and GHG benefits should prices prove to be higher than forecast. On the other hand, should fuel prices prove to be lower than forecast, the result could be a scenario of high priced new vehicles sitting unwanted and unaffordable on dealers lots, with unacceptable negative consequences. [OAR-2009-0472-7182.1, p.4]

[National Automobile Dealers Association also submitted these comments as testimony at the New York public hearing, See docket number EPA-HQ-OAR-2009-0472-4621, pp. 85-88.]

EPA Response:

The agencies reasonably believe that the new standards will result in increased vehicle sales (see sections III.H.5 and IV.G.7 of the preamble, and chapter 8 of EPA's RIA for more detail) and, as such, should ensure that dealership employment will not decrease as a result of this rule. Further, our analyses are based on the best available predictions of future fuel prices (AEO 2010 Early Release) which range from $2.61/gallon in 2012 to $3.07/gallon in 2016 (expressed in 2007 dollars and including taxes). While such prices are not low by traditional U.S. standards, they are by no means high.

5.13.5 Impacts on U.S. Vehicle Sales and Payback Period

Organization:

BMW of North America, LLC (BMW)
State of New Jersey
Mr. Richter - Environmental Capital Partners
Shaw, Donald F.
Chew, Yuli
US Steel Corporation
University of Pennsylvania, Environmental Law Project
National Automobile Dealers Association

Comment:

BMW of North America, LLC (BMW)

Now, as EPA and NHTSA have noted in the proposal, it's important that consumers retain a full range of vehicle choices and you've designed the calculation methods to preserve vehicle [These comments were submitted as testimony at the New York public hearing. See docket number EPA-HQ-OAR-2009-0472-4621, pp. 132.] choice, which is very good. For auto manufacturers to meet the aggressive greenhouse gas and CAFE standards proposed in this rulemaking, compliance flexibility and accommodation for different size vehicles must be provided. [These

comments were submitted as testimony at the New York public hearing. See docket number EPA-HQ-OAR-2009-0472-4621, p. 133.]

State of New Jersey

The Agencies requested commenter input on a number of related topics regarding how the proposal balances the needs of consumers with the need to reduce greenhouse gas emissions from one of the nation's most significant greenhouse gas emission sources. The Department feels that USEPA and NHTSA have crafted the proposal in a way that will ensure that consumers will continue to have the variety and choice in vehicle models they have come to expect. The standards provide manufacturers with significant flexibility in meeting the proposed greenhouse gas reductions, and New Jersey is confident that the technologies to reduce vehicle greenhouse gas emissions exist in the market today. The phase-in of the standards between 2012 and 2016 allows manufacturers seven years to incorporate these technologies into greater numbers of vehicles. [OAR-2009-0472-7109.1, pp.5-6]

Mr. Richter - Environmental Capital Partners

And I think as I mentioned as a member of an investment firm that specifically targets the environmental [EPA-HQ-OAR-2009-0472-4621, p.160] I mean, we feel like this will be the dominant asset in the years to come. I really want to underscore the economic argument as has been used in the past against increasing mileage standards and it may be the single most important reason for increasing CAFE standards, and I would say there are two real reasons for this. [EPA-HQ-OAR-2009-0472-4621, p.161]

Al Gore famously pointed out that our fleet would be unable to be sold in China. I think it's pretty clear that we need to learn from the past and not make that mistake again. You know, I'm not going to sit here and predict what kind of cars will be sold in the future, but I think all of us in the room will be pretty certain on which ones won't be sold, and that's the ones that are relying on decades old technology, we will be moving forward, and high standards that we can put in with the CAFE standards will increase competitiveness and this is particularly true as it relates to resource efficiency. This resource efficiency pushes innovation, innovation creates economic opportunity here at home. Last week, GM announced [EPA-HQ-OAR-2009-0472-4621, p.162] plans to invest $230 million in four Michigan plants to build the Cruze and the Volt, restoring 500 jobs. I mean, there are so many cascading effects that come from investing in innovation. [EPA-HQ-OAR-2009-0472-4621, p.163]

Shaw, Donald F.

The imposition of these standards will impose severe financial hardships on the already economically challenged Auto industry, resulting in the massive loss of jobs and disruption to the entire economy. People will not buy the new impractical cars, but will keep their “useful” autos until they die. [OAR-2009-0472-7270.1, p. 1]

Our economy is already fragile, why risk further deterioration? How much additional government subsidy dollars are required to aid the auto industry? [OAR-2009-0472-7270.1, p. 1]

Chew, Yuli

As to the economic costs, I believe that that buyer will be more concerned with the full life-cycle costs, personally value savings as the most important issue. This is in line with the CARB's Regulations to Control Greenhouse Gas Emissions from Motor Vehicles, Final Statements of Reasons, August 4, 2006, it stated that "cost effective" is defined as "Economical to an owner or operator of a vehicle, taking into account the full life-cycle costs of a vehicle. [OAR-2009-0472-7042.1, p.6]

US Steel Corporation

In any case, the application of these aggressive fuel economy standards will require vehicle manufacturers to apply new technology, including advanced materials (including aluminum, magnesium, composites, and advanced high-strength steels) to vehicles, the sum total of which will raise vehicle prices and slow down sales accordingly with negative consequences to the general economy. [OAR-2009-0472-7197.1, pp.6-7]

University of Pennsylvania, Environmental Law Project

3. Expected Costs of Implementation of the Proposed Rule
As previously mentioned, some groups worry about the economic costs of rule implementation. They argue that the proposed rule could add too much to the price of new cars. This will lead, they say, to people sticking with their older, gas-guzzling cars instead of buying new ones, thereby undermining the primary goal of the rule of lowering vehicle emissions [OAR-2009-0472-7286.1, pp. 20-21].

However, most stakeholders, including the auto industry and Auto Dealers Association support the rule and agree that this standard can be met without undue costs. They also point to the benefits of a predictable national standard that will help to lessen uncertainty for the auto industry when they develop new models, and lower compliance costs by avoiding a patchwork of rules between the states. Furthermore, it will allow them time to build improvements into new models during the normal production and design process, which will minimize the additional costs imposed. [OAR-2009-0472-7286.1, p. 21]

National Automobile Dealers Association

Regarding vehicle affordability, the critical importance of fuel price and availability cannot be overstated. New vehicle purchasers typically aren't early adaptors of high priced new technologies, nor are they so well off as to ignore fuel efficiency even when fuel prices are high. Instead, the vast majority of new vehicle purchasers are payment buyers with multi-year loans who only become keenly interested in fuel economy when fuel prices skyrocket. Clearly, it is very difficult to forecast fuel prices in a free market. By relying on conservative fuel price forecast assumptions, the National Program will at worse achieve better fuel economy and GHG benefits should prices prove to be higher than forecast. On the other hand, should fuel prices prove to be lower than forecast, the result could be a scenario of high priced new vehicles sitting unwanted and unaffordable on dealers lots, with unacceptable negative consequences.

EPA Response:

EPA and NHTSA have included a number of flexibilities in the rule to reduce the costs of implementation and to increase the options that auto makers have for achieving the standards. We have also considered the lead times for auto makers to comply with the standards. The technologies analyzed in this rule are, generally, already available. EPA expects that auto companies will continue to pursue new technologies. EPA's Preamble Section III.H.5 and RIA Section 8.1.3 estimate a payback period of under 3 years for the fuel-saving technologies to comply with the standards. If consumers consider at least 3 years of fuel savings when buying vehicles, then the new vehicles should be more attractive to them than existing vehicles, and sales might increase, as estimated in the analyses found in these sections.

EPA's benefits analysis incorporates the life-cycle costs and fuel savings, to reflect the effects of the vehicles over the years. Because (as discussed in Response to Comments Section 4.5.1) the evidence is uncertain on the role of fuel economy in consumer vehicle purchases, EPA assumes, in its vehicle sales impact analysis, that consumers consider five years' worth of fuel savings when buying a vehicle. As also discussed in Response to Comments Section 4.5.1, the role of fuel savings in vehicle purchase need not be the same as the actual savings that will occur.

5.13.6. Non-Greenhouse Gas Health and Environmental Impacts

Organization: Environmental Defense Fund
Institute for Policy Integrity at New York University School of Law
University of Pennsylvania, Environmental Law Project
South Coast Air Quality Management District

Comment:

Environmental Defense Fund

To maximize the benefits of the final standards, it is essential to fully account for the extraordinary and far-reaching protections that result from reducing heat-trapping emissions. Accordingly, the full range of environmental, social, and economic impacts of greenhouse gas emissions should be taken into account when calculating the societal costs of carbon. Where impacts cannot be quantified, federal policy makers should present a transparent qualitative analysis along with a recognition that monetized benefits are likely to be underestimates.

The co-benefits of the proposed standards, such as the health benefits from the reductions in smog-forming air pollutants, must also be incorporated into the economic analysis. And the analysis must not rely on flawed economic assumptions that diminish the value of protecting future generations.

Indeed, we have a solemn duty to provide a secure future for my generation and those that follow. The final rule must reflect this responsibility through appropriate economic

assumptions while also relying on ethical considerations beyond the scope of economic analysis alone.

[Comments are from LA Testimony, OAR-2009-0472-7283, pp.72-79]

Institute for Policy Integrity at New York University School of Law

Uses of the Social Cost of Carbon:
Central estimates of the social cost of carbon should not be used in optimization models, and should not replace traditional regulatory impact analysis for GHG emissions reductions. While incorporating ancillary benefits directly into the SCC is likely to prove difficult, the interagency group should provide guidance on the types of ancillary benefits typically associated with GHG reductions. [OAR-2009-0472-7246.1, p. 2] [See OAR-2009-0472-7246.1, pp. 39-44 for discussion and commenter recommendations related to the uses of the social cost of carbon.]

Ancillary Benefits:
There is a significant literature showing the relationship between greenhouse gas reductions and a host of ancillary benefits or "co-benefits." Because rules that control greenhouse gas emissions will often end up reducing fossil fuel combustion, emission of a range of conventional pollutants associated with fossil fuels can be expected to decline in the face of GHG regulation. Reductions in particulate matter, nitrogen oxides, sulfur dioxides, volatile organic compounds, and other pollutants can be anticipated to accompany GHG controls. [OAR-2009-0472-7246.1, p. 41]
For example, measures that increase energy efficiency or encourage clean energy generation will also lead to reductions in local air pollutants, with attendant benefits for human health and ecosystems. Other ancillary benefits include reduced ocean acidification and increased forest preservation. [OAR-2009-0472-7246.1, p. 41]

The magnitude of such ancillary benefits may be significant. For example, a forthcoming working paper estimates that representative federal climate legislation would result in health-related co-benefits of $3 to $9 per ton of carbon dioxide avoided (due to reductions in conventional air pollutants). Other studies, using different methodologies, have found similarly large benefits. Because the ancillary benefits of greenhouse gas reductions could represent an important component of total benefits, it is essential for rulemakings that use the interagency SCC estimates not to omit significant ancillary benefits. [OAR-2009-0472-7246.1, p. 42]

One mechanism to take ancillary benefits into account would be to imbed a default estimate of ancillary benefits within the SCC. An estimate of $5-$10 for ancillary benefits could be added directly to the SCC. Incorporating these ancillary benefits directly into the SCC would ensure that they were accounted for in regulatory analysis. [OAR-2009-0472-7246.1, p. 42]

However, because different rules will have different effects on ancillary pollutants, directly incorporating a default ancillary benefit estimate into the SCC is a second-best approach. Transportation rules may have different ancillary effects than rules governing power plants. Some rules may be directly targeted at reducing a conventional pollutant, so incorporating an "ancillary" effect in the SCC could result in double counting. For these reason, simply including

a default assumption concerning ancillary benefits will skew the analysis in some cases. [OAR-2009-0472-7246.1, p. 42]

If such a default assumption is not included, it is important for the interagency group to clarify that GHG reductions are often accompanied by ancillary benefits, and also to provide some guidance for agencies to ensure that they identify and take account of relevant ancillary effects. Citation to the literature on ancillary benefits associated with GHG reductions, as well as a default list of likely ancillary effects of GHG reductions, and perhaps a default value in a "typical rule," could also be provided by the interagency group to give guidance for future rulemakings. [OAR-2009-0472-7246.1, p. 42]

We recommend that the interagency group give explicit direction to agencies on how to account for ancillary benefits associated with GHG reductions. [OAR-2009-0472-7246.1, p. 42]

University of Pennsylvania, Environmental Law Project

NHTSA has not monetized reductions in toxic air pollutants due to the proposed standards (a benefit), nor potential reductions in vehicle performance or utility (a cost) that might result from the proposed standards. However, by any metric, NHTSA expects that the benefits of the proposed standards will vastly outweigh the costs. [OAR-2009-0472-7286.1, p.16]

South Coast Air Quality Management District

The South Coast AQMD is the nation's largest regional air pollution district, and we appreciate this opportunity to testify on this joint rulemaking.

The AQMD staff strongly support the proposed greenhouse gas emission standards and timeline. The proposed emission standards and companion fuel economy standards will result in a significant reduction in greenhouse gas emissions as well as provide crucially important co-benefits in reducing criteria emissions in support of attainment of federal and state air quality standards for ozone and fine particulates.

Given the strong correlation of rising temperature and increased ozone levels, it is especially germane that this hearing is being held in one of the nation's most polluted air basins.

There are over ten million registered light-duty vehicles in the South Coast Air Basin. Reductions in fuel use associated with the standards proposed will therefore have a direct and tangible benefit in terms of public health and welfare in our region.

[Comments are from LA Testimony, OAR-2009-0472-7283, pp.59-60.]

EPA Response:

EPA agrees with commenters that it is important to quantify the non-GHG health and environmental impacts associated with the proposed standard because a failure to adequately consider these ancillary impacts could lead to an incorrect assessment of their net costs and

benefits. Moreover, co-pollutant impacts tend to accrue in the near term, while any effects from reduced climate change mostly accrue over a time frame of several decades or longer.

In this final rule, EPA quantified and monetized the health and environmental impacts related to both PM and ozone in its regulatory impact analysis (RIA), based on changes in ambient air quality as determined by full-scale photochemical modeling. Although this modeling was not possible in the timeframe for the proposal, EPA did perform this modeling for the final rule, as described below.

To model the ozone and PM air quality benefits of the final rule, EPA used the Community Multiscale Air Quality (CMAQ) model (see Chapter 7.2 of the RIA that accompanies the final rule for a description of the CMAQ model). The modeled ambient air quality data served as an input to the Environmental Benefits Mapping and Analysis Program (BenMAP). BenMAP is a computer program developed by EPA that integrates a number of the modeling elements used in previous RIAs (e.g., interpolation functions, population projections, health impact functions, valuation functions, analysis and pooling methods) to translate modeled air concentration estimates into health effects incidence estimates and monetized benefits estimates.

In addition to the non-GHG ancillary health and environmental impacts that EPA quantified for analysis of the final Light-Duty Vehicle GHG standard, there are a number of other health and human welfare endpoints that EPA was unable to quantify because of current limitations in the methods or available data. For example, EPA has not quantified a number of known or suspected health effects linked with ozone and PM for which appropriate health impact functions are not available or which do not provide easily interpretable outcomes (e.g., changes in heart rate variability). In addition, EPA is currently unable to quantify a number of known welfare effects, including reduced acid and particulate deposition damage to cultural monuments and other materials, and environmental benefits due to reductions of impacts of eutrophication in coastal areas. For air toxics, the available tools and methods to assess risk from mobile sources at the national scale are not adequate for extrapolation to benefits assessment. In addition to inherent limitations in the tools for national-scale modeling of air toxics and exposure, there is a lack of epidemiology data for air toxics in the general population. All of the above-mentioned health impact omissions contribute to a likely underestimate of the total benefits attributable to the final rule.

Please refer to Chapter 7.3 of the RIA that accompanies the final rule for more information about the quantification and monetization of non-GHG-related benefits.

EPA notes IPI and EDF's recommendation for the interagency group to "give explicit direction to agencies on how to account for ancillary benefits associated with GHG reductions" (7246.1, pg 42). As noted in Section 4.5.4, the SCC TSD reiterates the need to document more thoroughly omitted impacts and monitor the literature for emerging research. As the research evolves, the Federal government, including EPA, is committed to exploring how modeling can be improved so that these aspects are better reflected in the SCC.

5.13.7. Energy Security Impacts

Organization: Fraas, Arthur, G.

Comment:

The joint DOT and EPA proposed CAFE standard represents an ambitious and challenging policy initiative that will reduce the oil consumption and the greenhouse gas emissions of light duty cars and trucks for the model years 2012 through 2016. At the same time, this rule will increase the initial purchase price of new vehicles and pose a substantial challenge to car and truck manufacturers in their efforts to comply with the proposed standards. As a result, the proposal raises a number of interesting analytical and policy questions. This comment will focus on one of these questions—the quantification of the energy security benefits of the proposed rule. [OAR-2009-0472-7523, p. 1]

Energy security benefits—typically including several disparate categories: national security benefits, macroeconomic disruption and adjustment benefits, and the benefits of exercising monopsony power to counter the exercise of market power by oil producing countries—have served as critical arguments in support of the rationale for government policies designed to secure greater energy independence for the United States. Over the last several decades, there has been a continuing debate about the nature and magnitude of each of these energy security benefit categories and the role that they ought to play in shaping U.S. energy policy. The DOT/EPA joint proposal discusses some of these issues and develops an estimate of energy security benefits as an integral part of the joint proposed CAFE rule. In particular, DOT and EPA would incorporate an estimate of the macroeconomic disruption/adjustment benefits as a part of the proposed rule's decision framework, while excluding from the CAFE calculation an estimate of the monopsony premium. [OAR-2009-0472-7523, pp. 1-2]

I support the DOT and EPA proposal to exclude the monopsony premium from the CAFE calculation although for a more general reason than that put forward by DOT and EPA—and will address the proposed macroeconomic disruption/adjustment benefits incorporated in the calculation of the standard in their CAFE proposal. [OAR-2009-0472-7523, p. 2]

The Monopsony Premium

DOT and EPA Proposed Approach—As a part of the CAFE NPRM, DOT and EPA have proposed to consider only the macroeconomic disruption/adjustment component in developing an estimate of energy security benefits associated with a reduction in the consumption of petroleum products. This departs from recent practice. In developing estimates of the energy security benefit of reducing petroleum consumption in past rules, DOT and EPA have also included an estimate of the "monopsony premium." The monopsony premium represents the avoided payments to oil producers in foreign countries associated with a decline in the world price of oil resulting from decreases in U.S. oil consumption. [OAR-2009-0472-7523, p. 2]

DOT and EPA propose to exclude the monopsony premium from the estimate of energy security benefits because this proposed rule adopts a global value for the social cost of carbon (SCC). DOT and EPA provide their rationale for excluding monopsony benefits as follows (74 FR 49622):

How should the energy security premium be used when some benefits from the proposed rule, such as the benefits of reducing greenhouse gas emissions, are calculated at a global level? Monopsony benefits represent avoided payments by the U.S. to oil producers in foreign countries that result from a decrease in the world price as the U.S. decreases its consumption of imported oil. Although there is clearly a benefit to the U .S. when considered from the domestic perspective, the decrease in price due to decreased demand in the U .S. also represents a loss of income to oil producing countries. Given the redistributive nature of this effect, do the negative effects on other countries "net out" the positive impacts to the U.S.? If this is the case, then, the monopsony portion of the energy security premium should be excluded from the net benefits calculation for the rule. [OAR-2009-0472-7523, p. 2]

However, DOT and EPA also offer an alternative rationale that would justify including the monopsony premium in the estimate of energy security benefits (74 FR 49623):
"...the global SCC is used in these calculations, not because the global net benefits of the rule are being computed (they are not), but rather because in the context of a global public good, the global marginal benefit is the correct domestic benefit against which domestic costs are to be compared. Similarly, energy security is inherently a domestic benefit. Thus, should the two benefits, if they are both viewed from this domestic perspective, be counted in the net benefits estimates for this rulemaking and more generally what are the overall implications of this approach to justifying regulation? If the monopsony benefits were included in this case, they could be significant. [OAR-2009-0472-7523, p. 3]

DOT and EPA have requested comment on their approach and on the alternative rationale presented above for including a monopsony premium in the benefits analysis. [OAR-2009-0472-7523, p. 3]

Comment on the Monopsony Premium — There is a more general—and I believe more compelling—rationale that justifies the decision not to consider the monopsony premium as a part of a benefit-cost analysis of regulatory action than that offered by DOT and EPA. The monopsony premium reflects a pecuniary externality—that is, an externality that operates through the effect of the regulatory action on prices--rather than a direct resource effect on a third party. There is a general consensus among economists that pecuniary externalities should not be considered in benefit-cost analyses of governmental actions. Economists point out that the pecuniary externality does not affect resource allocation, but government action to address the pecuniary externality will further distort resource use. In the specific case of energy security benefits, for example, Brown and Huntington, in their September 2009 paper titled "Estimating U .S. Oil Security Premiums," [See OAR-2009-0472-7523, pp. 7-38 for Brown and Huntington 2009 paper.] exclude the consideration of the monopsony premium "because it is not a security concern and because pursuing these gains would distort global resource use rather than offset an externality." Similarly, the October 2009 National Academy of Sciences (NAS) report on the Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use finds with respect to the monopsony premium "...that no externality in the sense considered in this report exists." (p. 235) As a result, the NAS report does not include the monopsony premium as a part of an estimate of the "unpriced consequences" of energy production and use. [OAR-2009-0472-7523, p. 3]

The existence of an externality is a crucial test because by addressing true externalities—sometimes identified as technical externalities—government regulation can improve the well-being of society. This is the context and purpose of a benefit-cost analysis. On the other hand, addressing a pecuniary externality only serves to affect the transfer of income without improving the allocation of resources and the production possibilities of the economy. [OAR-2009-0472-7523, p. 3]

There is a policy argument that because OPEC exercises market power to inflate the world oil price (by restricting oil production), it would be appropriate for the United States to exercise its monopsony power as a major consumer of oil to reclaim some of the oil revenues realized by oil producing countries. However, there are some countervailing reasons that support a decision to exclude the consideration of a monopsony premium. First, such a policy further distorts the use of oil resources because its effect, like that associated with the exercise of monopoly power, would be to reduce consumption below the optimal level. Second, the successful use of monopsony power depends on the response of OPEC, other oil producing countries, and oil consuming countries. The exercise of market power by the United States is designed purely to transfer income from oil producing countries to the United States. Any policy initiative taken for this purpose should carefully develop the rationale for the pursuit of such a "beggar thy neighbor" policy. In any event, even if the revenue transfers realized by exercising monopsony power are used to support a policy decision to restrict the consumption of oil through regulation, these transfers are unrelated to a standard externality and ought not be included as a part of the benefit-cost analysis of the rule. [OAR-2009-0472-7523, pp. 3-4]

Oil Disruption Costs

DOT and EPA Proposed Approach—With respect to disruption costs, DOT and EPA have adopted the updated estimates for the macroeconomic disruption/adjustment costs based on a March 2008 study titled "The Energy Security Benefits of Reduced Oil Use, 2006-2015." These estimates (in 2007 $) range from $6.70 per barrel ($3 .11- $10.67) in 2015 to $8.12 per barrel ($3.90 - $13.04) in 2030. [OAR-2009-0472-7523, p. 4]

Comment on Oil Disruption Costs—The September 2009 Brown and Huntington paper develops an alternative, lower estimate of the macroeconomic disruption/adjustment costs. Their estimate of the cost of displacing a barrel of domestic oil with a barrel of imported oil ranges from $2.17 per barrel in 2015 to $2 .37 per barrel in 2030 (in 2007 dollars). The differences in the estimates reported by EPA and Brown and Huntington appear to reside in differences in the approach used in estimating the change in U .S. oil prices resulting from an oil supply shock. The EPA estimate is based on a methodology that allocates a portion of the oil supply shock to the U.S. and then calculates the effect on oil prices using estimates of short-run demand and non-OPEC supply elasticity. Brown and Huntington use a world oil market model to develop effects of an oil supply shock on the world oil price and then use the resulting world oil price to estimate U.S. macroeconomic disruption costs. [OAR-2009-0472-7523, p. 4]

In addition, although the October 2009 NAS report on the hidden costs of energy recognizes that "...policies that lead to a reduction in oil consumption in the United States will most assuredly

reduce our vulnerability to future oil shocks, ...", it reaches the conclusion that oil disruption costs are not an externality. As a result, the NAS report recommends that further research is needed to better understand this possible externality and the report does not include a quantitative estimate of the energy disruption costs of imported oil in developing estimates of the unpriced externalities associated with energy infrastructure and security. (p. 236) [OAR-2009-0472-7523, p. 4]

In light of this advice, I believe that DOT and EPA need to sort out whether to include a macroeconomic disruption/adjustment cost component in their evaluation of the benefits and costs of the proposed CAFE rule. If DOT and EPA decide to retain some estimate of the disruption costs as an estimate of energy security benefits, the agencies need to justify the decision and develop a reasoned basis for the magnitude of their estimate taking into consideration the recent estimates provided by Brown and Huntington. [OAR-2009-0472-7523, p. 4-5] [See OAR-2009-0472-7523, pp. 7-38 for Brown and Huntington 2009 paper.]

EPA Response:

EPA appreciates that this commenter felt that that the magnitude of the economic disruption portion of the energy security benefit may be too high. This commenter cites a recent paper written by Stephen P.A. Brown and Hillard G. Huntington, entitled "Estimating U.S. Oil Security Premiums" (September 2009) as the basis for his comment. EPA reviewed this paper and found that it conducted a somewhat different analysis than the one conducted by ORNL in support of this rule. The Brown and Huntington paper focuses on policies and the energy security implications of increasing U.S. demand for oil (or at least holding U.S. oil consumption constant), while the ORNL analysis examines the energy security implications of decreasing U.S. oil consumption and oil imports. These asymmetrical analyses would be expected to yield somewhat different energy security results.

However, even given the different scenarios considered, the Brown and Huntington estimates are roughly similar to the ORNL estimates. For example, for an increase in U.S. consumption that leads to an increase in U.S. imports of oil, Brown and Huntington estimate a 2015 disruption premium of $4.87 per barrel, with an uncertainty range from $1.03 to $14.10 per barrel. The corresponding 2015 estimate for ORNL as the result of a reduction in U.S. oil imports is $6.70 per barrel, with an uncertainty range of $3.11 to $10.67 per barrel. Given that the two studies analyze different scenarios, since the Brown and Huntington disruption premiums are well within the uncertainty range of the ORNL study, and given that the ORNL scenario matches the specific oil market impacts anticipated from the rule while the Brown and Huntington paper does not, EPA has concluded that the ORNL disruption security premium estimates are more applicable for analyzing this final rule.

This commenter also felt that the monopsony effect should be excluded from net benefits calculations for the rule since it is a "pecuniary" externality or does not represent an efficiency gain. EPA disagrees that all pecuniary externalities should a priori be excluded from net benefits calculations. For example, in the case here, the oil market is non-competitive, and if the social decision-making unit of interest is the U.S., there is an argument for accounting for the

monopsony premium to assess the excess transfer of wealth caused by the exercise of cartel power outside of the U.S.
However, for the final rule, EPA continues to take a global perspective with respect to climate change by using the global SCC value. Therefore, the EPA did not count monopsony benefits since they "net out" with losses to other countries outside the U.S. Since EPA is taking a global perspective, EPA did not undertake a distributional analysis for this final rule, since the losses to the losers (oil producers that export oil to the U.S.) would equal the gains to the winners (U.S. consumers of imported oil). As a result, EPA continues to included only the macroeconomic disruption portion of the energy security benefits to monetize the total energy security benefits of this rule.

Organization: New York University School of Law, Institute for Policy Integrity (IPI)
Mr. Richter - Environmental Capital Partners

Comment:

Energy Security Effects

The agencies consider how the proposed regulations might generate three possible benefits to "energy security" by reducing U.S. consumption of petroleum: (1) lower oil prices worldwide as U.S. demand drops; (2) decreased risk to the U.S. economy from a sudden disruption in oil supplies; and (3) reduced costs for U.S. energy security policies. The first effect should be treated as a distributional consequence, not a standard efficiency benefit. The second effect should be valued as a benefit, so long as the agencies disaggregate any wealth transfers that occur during price shocks. The agencies were justified in not quantifying the last effect (i.e. treating it as having zero value), provided the agencies incorporate the increased protection value of the Strategic Petroleum Reserve into their calculation of disruption effects. [OAR-2009-0472-7232.3, p. 12]

Demand Effects

Often referred to as a "monopsony" effect, oil consumers in the United States do, in aggregate, exert enough influence on the worldwide demand for oil that a variation in U.S. demand will affect prices (although recent evidence suggests the effect might be limited). If the proposed regulations reduce U.S. demand, prices will drop, and U.S. consumers will experience some additional savings. [OAR-2009-0472-7232.3, p. 12]

But these perceived savings come at the expense of lost revenue to the oil suppliers. Globally, there are no net benefits from the demand effects. The agencies currently choose not to calculate any benefits from demand effects because they select a global value for the social cost of carbon, and they believe a consistently global perspective on costs and benefits may be required. [OAR-2009-0472-7232.3, p. 12]

However, the agencies seek comment on another possible approach:
"From one perspective, the global social cost of carbon is used in these calculation, not because the global net benefits of the rule are being computed (they are not), but rather because in the

context of a global public good [like climate change mitigation], the global marginal benefit is the correct domestic benefit against which domestic costs are to be compared. Similarly, energy security is inherently a domestic benefit. Thus, should the two benefits, if they are both viewed from this domestic perspective, be counted in the net benefits estimates for this rulemaking, and more generally what are the overall implications of this approach to justifying regulation?" [OAR-2009-0472-7232.3, p. 13]

The agencies repeatedly note that demand effects could be "significant." But the issue of how to include demand effects is not a choice between a global or a domestic perspective on costs and benefits. Rather, the agencies should address the demand effects through a distributional analysis. [OAR-2009-0472-7232.3, p. 13]

As the agencies note, wealth transfers are not typically included as a "benefit." OMB guidance provided in the Circular A4 confirms that cost-benefit analysis focuses on measuring the economic efficiency of a regulation, and wealth transfers do not offer any efficiency gains or losses. However, efficiency is not necessarily the only relevant policy consideration, and therefore such transfers and other distributional effects must be considered as part of a separate distributional analysis. [OAR-2009-0472-7232.3, p. 13]

The agencies should assess how demand effects might generate distributional gains for U.S. oil consumers at the expense of foreign (and domestic) oil producers. The agencies could consider how income, or other distributional weights, might factor into such an analysis. The agencies should also, pursuant to OMB recommendations and the principles of Executive Order 12866, incorporate such a study of demand effects into a broader distributional analysis. [OAR-2009-0472-7232.3, p. 13]

Note that—given the agencies' statutory mandates—there is nothing inconsistent about using a global social cost of carbon estimate and still giving some preference to policies that generate distributional gains for the United States at the expense of foreign companies or countries. [OAR-2009-0472-7232.3, p. 13]

Disruption Effects

The agencies calculate how reducing U.S. oil consumption will decrease the risk of lost economic output during a sudden, unanticipated disruption in oil imports and supplies. However, the Joint Technical Support Document suggests part of this calculation might include the higher price of imported oil caused by a supply disruption and price shock, which, as the agencies acknowledge, is a "wealth transfer." Such effects are no different analytically than the demand/monopsony effects considered above. Thus, any such import effects should be disaggregated from the disruption effects, and should instead be considered in the type of distributional analysis discussed above. [OAR-2009-0472-7232.3, p. 14]

Security Policy Effects

The two main security policy effects of reducing U.S. demand for oil are: a possible impact on

U.S. military activities in politically instable regions that supply oil; and a possible impact on the size or valuation of U.S. Strategic Petroleum Reserve. [OAR-2009-0472-7232.3, p. 14]

The agencies have chosen not to calculate any budgetary outlays for military expenses as a benefit because, given the size of likely oil import reductions and the broad range of policy objectives targeted by various U.S. military missions, economic analysis predicts military costs are unlikely to change as a result of the proposed regulations. Importantly, this case is distinct from the agencies' decision not to quantify other uncertain costs or benefits (particularly, lost consumer welfare), because zero is, according to the best economic analysis, a plausible estimate for this hard-to-quantify element. Therefore, fewer policy and legal risks are raised by the choice not to quantify. It is also commendable that NHTSA conducted a sensitivity analysis on potential military effects. [OAR-2009-0472-7232.3, p. 14]

By decreasing U.S. demand for oil, the proposed regulations could either decrease the need to maintain such a large Strategic Petroleum Reserve, or it could increase the protective value offered by the current Strategic Petroleum Reserve. The decision not to quantify any cost savings from maintaining a smaller Strategic Petroleum Reserve is justified so long as the agencies have incorporated the increased protective value from maintaining the current Strategic Petroleum Reserve into the calculation of disruption effects. [OAR-2009-0472-7232.3, p. 14]
Less obvious, but more really more important, is the connection to our strategic defense. I'm sure you've heard this argument, but the less gas we burn, of course, the less foreign oil we import, and it's estimated that we export the equivalent of the TARP bail-out, approximately $750 billion every year to import foreign carbon. That's money flowing out of our economy and primarily into countries that do not have our best interest in mind. The more we rely on other countries for strategic resources, the less stability that we have here at home, less foreign oil imported means more domestic security. [EPA-HQ-OAR-2009-0472-4621, p.160]

EPA Response:

EPA has addressed the monopsony issue in its response to the previous comment.

In the energy security literature, the macroeconomic disruption component of the energy security premium traditionally has included both (1) increased payments for petroleum imports associated with a rapid increase in world oil prices, and (2) the GDP losses and adjustment costs that result from projected future oil price shocks. This comment from the New York University School of Law suggested that the increased payments associated with rapid increases in petroleum prices (i.e., price increases in a disrupted market) represent transfers from U.S. oil consumers to petroleum suppliers rather than real economic costs, and therefore, should not be counted as a benefit.

The approach recommended by the commentor would represent a significant departure from how the macroeconomic disruption costs associated with oil price shocks have been quantified in the broader energy security literature, and the EPA believes it should be analyzed in more detail before being applied in a regulatory context. In addition, the EPA also believes that there are compelling reasons to treat higher oil import costs during oil supply disruptions differently than simple wealth transfers that reflect the exercise of market power by petroleum sellers or

consumers. According to the OMB definition of a transfer: "Benefit and cost estimates should reflect real resource use. Transfer payments are monetary payments from one group to another that do not affect total resources available to society…The net reduction in the total surplus (consumer plus producer) is a real cost to society, but the transfer from buyers to sellers resulting from a higher price is not a real cost since the net reduction automatically accounts for the transfer from buyers to sellers."[59] In other words, pure transfers do not lead to changes in the allocation or consumption of economic resources, whereas changes in the resource allocation or use produce real economic costs or benefits.

While price increases during oil price disruptions can result in large transfers of wealth, they also result in a combination of real resource shortages, costly short-run shifts in energy supply, behavioral and demand adjustments by energy users, and other response costs. Unlike pure transfers, the root cause of the disruption price increase is a real resource supply reduction due, for example, to disaster or war. Regions where supplies are disrupted (i.e., the U.S.) suffer very high costs. Businesses' and households' emergency responses to supply disruptions and rapid price increases are likely to consume some real economic resources, in addition to causing financial losses to the U.S. economy that are matched by offsetting gains elsewhere in the global economy.

While households and businesses can reduce their petroleum consumption, invest in fuel switching technologies, or use futures markets to insulate themselves in advance against the potential costs of rapid increases in oil prices, when deciding how extensively to do so, they are unlikely to account for the effect of their petroleum consumption on the magnitude of costs that supply interruptions and accompanying price shocks impose on others. As a consequence, the U.S. economy as a whole will not make sufficient use of these mechanisms to insulate itself from the real costs of rapid increases in energy prices and outlays that usually accompany oil supply interruptions.[60] Therefore, the ORNL estimate of macroeconomic disruption and adjustment costs that the EPA uses to value energy security benefits includes the increased oil import costs stemming from oil price shocks that are unanticipated and not internalized by advance actions of U.S. consumers of petroleum products. The EPA believes that, as the ORNL analysis argues, the uninternalized oil import costs that occur during oil supply interruptions represents a real cost associated with U.S. petroleum consumption and imports, and that reducing its value by lowering domestic petroleum consumption and imports thus represents a real economic benefit from lower fuel consumption.

EPA appreciates the comments on how to account for the potential military cost associated with maintaining a U.S. military presence to help secure stable oil supply from potentially vulnerable regions of the world. These comments indicated that EPA should not attempt to monetize U.S.

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[59] OMB Circular A-4, September 17, 2003. See http://www.whitehouse.gov/omb/assets/omb/circulars/a004/a-4.pdf

[60] For a more complete discussion of the reasons why the oil import cost component of the macroeconomic disruption and adjustment costs includes some real costs and does not represent a pure transfer, see Paul N. Leiby, *Estimating the Energy Security Benefits of Reduced U.S. Oil Imports: Final Report*, ORNL-TM-2007-028, Oak Ridge National Laboratory, March 14, 2008, pp. 21-25.

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military costs nor include these costs in the energy security analysis. At this time, EPA agrees with these comments. In fact, a recent study conducted by the National Academy of Sciences (NAS)[61] notes that it is difficult to disentangle military spending to achieve political goals from spending to protect petroleum supply routes. Further, it notes that spending to protect petroleum supply routes would not likely change, given a moderate reduction in oil flowing from volatile regions to the U.S. However, the NAS study also suggests that a very large reduction in oil demand could affect military spending. The EPA has adopted the NAS position that a change in military spending is unlikely given a moderate reduction in oil demand, and continues to exclude a monetary estimate of military costs in our energy security calculations for this rule. However, EPA also believes that more examination of this issue may be warranted in the future.

Organization: Environmental Defense Fund.

Comment:

And, finally, there's this looming question about -- and this is discussed again in the preamble about one of the other factors that NHTSA has to consider about the need to conserve energy -- and I was interested that the preamble quotes from the June 30, 1977 Federal Register to the effect that the need to conserve energy encompasses, and this is a quote from the preamble, the consumer cost, national balance of payments, environmental and foreign policy implications of our needs for large quantities of petroleum, especially imported petroleum. And, by the way, this letter that I attached on the social cost of carbon talks about those factors in greater length, but then the preamble itself only mentions really three of those four factors, [These comments were submitted as testimony at the New York public hearing. See docket number EPA-HQ-OAR-2009-0472-4621, p. 125.] which are the impacts of our national debt on the world oil price, the risks of disruption and securing imported oil military expenses, which are obviously considerable for this country, but it doesn't mention the fourth, which is the impact of our oil consumption in the motor vehicle sector on our balance of payments, and I think we have to recognize, you know, a year and a half ago when our trade deficit was at $800 billion, our current account deficit was almost at $800 billion, oil accounted for almost half of it. Today, because of this recession that we're in, the latest figures are that our trade deficit has been halved, down to a mere $400 billion, but you multiply the amount of oil that we're now importing, which is down from where it was about a year and a half ago, but about 10 million gallons per day total, and a good portion of that is in the motor vehicle sector, we are spending [These comments were submitted as testimony at the New York public hearing. See docket number EPA-HQ-OAR-2009-0472-4621, p. 126.] 250 to 300 billion dollars on importing oil, which is, you know, two thirds or more of our current, you know, trade deficit, and there is beginning to be in the economic literature a lot of talk about the status of the dollar as a reserve currency, and, you know, the status of the dollar in the payments for oil. Oil is denominated in dollars. Well, the fact is that if that trade deficit and the amount of money that we're spending on imported oil continues, the likelihood that oil is going to continue to be denominated in dollars is going down, and that really has to be a factor. It's not a factor that the Energy Information Administration is probably going to take into account, but it does seem to me in the social cost of carbon something that you do need to take into account. If that happened, there could be radical changes

[61] *Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use*, NAS, ISBN - 10: 0-309-14636-4. February 2010.

in the price of oil. So I think, particularly from NHTSA's [These comments were submitted as testimony at the New York public hearing. See docket number EPA-HQ-OAR-2009-0472-4621, p. 127.] point of view in setting the standard, you really have to take into account the contribution of imported oil to our balance of payments and the implications of all that for the sustain ability of the value of the dollar, and, you know, given world trade organization rules, I don't see anyway in which this country can discriminate between imported oil and domestically produced oil, and, therefore, the only way to reduce the huge contribution that imported oil makes to our trade deficit and our current account deficit and what it's doing to our economy, which is awful, the only way to deal with it is to cut down very significantly in the use of oil in our transportation sector, and what you're doing is a step in the right direction, but I believe that this consideration would drive you to be just as aggressive as you possibly can. [These comments were submitted as testimony at the New York public hearing. See docket number EPA-HQ-OAR-2009-0472-4621, p. 128.]

EPA Response:

EPA's energy security analysis estimates the impacts of this rule on U.S. oil imports. Clearly, these estimated reductions in U.S. oil imports will have impacts on the U.S. trade balance and balance of payments with other countries through time. It is beyond the scope of this analysis to estimate how changes in the U.S.'s trade and balance of payments from this rule will influence the world financial system.

5.14. Statutory and Executive Order Reviews

Organization: Competitive Enterprise Institute
Institute for Liberty
National Asphalt Pavement Association
American Chemistry Council, American Iron and Steel Institute, American Meat Institute, Corn Refiners Association, National Oilseed Processors Association
Peabody Energy Company
American Petroleum Institute

Comment:

Competitive Enterprise Institute

III. The proposed standards will spawn an economically-chilling regulatory morass.

EPA Administrator Jackson certifies that the proposed rule "would not have a significant economic impact on a substantial number of small entities." In reality, EPA's proposed GHG standards will subject millions of previously unregulated small entities to the risk of new regulation, controls, paperwork, penalties, and litigation. Moreover, the endangerment finding on which the proposed rule is predicated will also expose the economy as a whole to the risk of unprecedentedly severe constraints under the NAAQS program. [OAR-2009-0472-7281.1, p.10]

Institute for Liberty

The disproportionate impact of federal environmental regulations on the small business sector led President Clinton to support the 1996 Small Business Regulatory Enforcement Fairness Act (SBREFA). Among other things, SBREFA amended the Regulatory Flexibility Act of 1980 to require a panel of government officials (made up of employees from the EPA, the U.S. Small Business Administration's (SBA) Office of Advocacy, and the Office of Management and Budget's Office of Information and Regulatory Affairs) and representatives of small entities to examine regulatory proposals and suggest less burdensome alternatives that would meet EPA's underlying environmental protection objectives while minimizing impact on small entities. These panels, entitled, "Small Business Advocacy Review Panels," issue a report that is published in conjunction with a proposed regulation. That way, the EPA benefits from sensitivity towards its impact on small business and the public benefits from a more transparent disclosure of benefits, costs, and potential alternatives.

Unfortunately, the EPA did not avail itself of the Small Business Advocacy Review Panel process prior to proposing this rule. This is unfortunate, especially since the U.S. Small Business Administration, Office of Advocacy, twice advised the EPA to convene the small business panel well before EPA issued its proposal.

We respectfully request that EPA to withdraw this rule. And, we further request that EPA convene a Small Business Advocacy Review panel under section 609 of the Regulatory Flexibility Act. These recommendations, if followed, will allow for EPA to develop alternatives that will minimize the impact on small business while reducing GHG emissions. Our recommendations come at a time when sensitivity towards small business not only makes sense; it is of vital importance for our country's economic recovery. [OAR-2009-0472-7284.1, p.4]

EPA's reliance on Section 609(c) of the RFA to avoid the required analysis is equally illogical. That section authorizes EPA to forgo the statutory requirement to —prepare and make available for public comment an initial regulatory flexibility analysis describing the rule's impact on small entities. 5 U.S.C. § 603(a). The RFA directs that this analysis —shall be published in the Federal Register at the time of the publication of general notice of proposed rulemaking for the rule. Thus, 609(c) does not exempt EPA from these clear mandates—rather, Section 609's small entity outreach —requirements apply *before* the EPA proposes a rule. *West Va. Chamber of Comm. v. Browner*, 166 F.3d 366, 1998 WL 827315, *3 (4th Cir. 1998). [OAR-2009-0472-7143.1, p.4]

National Asphalt Pavement Association

Our concern is in EPA's certification statement in the current proposal [74 Fed Reg 49629]: ' .... that this proposed rule will not have a significant economic impact on a substantial number of small entities. However, EPA recognizes that some small entities continue to be concerned about the potential impacts of the statutory imposition of PSD requirements that may occur given the various EPA rulemakings currently under consideration concerning greenhouse gas emissions . .... Concerns about the potential impacts of statutorily imposed PSD requirements on small entities will be the subject of deliberations in that consultation and outreach. Concerned small entities should direct any comments relating to potential adverse economic impacts on small

entities from PSD requirements for GHG emissions to the docket for the PSD tailoring rule.' [OAR-2009-0472-7224.1, pp.1-2]

It is critical that all potentially affected entities understand the impact of EPA regulating greenhouse gas emissions under the light-duty vehicle proposal. In contrast to EPA's suggestion recommending that stationary (industrial) sources address any concerns that they have through comments on the upcoming 'tailoring rule' -- once EPA regulates greenhouse gases from light-duty vehicles, these sources will already be subject to PSD as defined in the Clean Air Act. Bottom line: the greenhouse gas threshold values proposed are totally discordant with the current Clean Air Act. As representatives of a small industrial source sector, we implore EPA to correct and address this situation now. [OAR-2009-0472-7224.1, p.2]

For example, any state operating permit issued with greenhouse gas, i.e., carbon dioxide thresholds, higher than those identified within the current Clean Air Act, would be vulnerable to appeal and litigation. Certainly, EPA must fully evaluate the collateral impact this proposal would have on all other aspects of the Clean Air Act including, but not limited to, the impact on state and local air permitting authorities, businesses, industry and the economy in all areas of the country. [OAR-2009-0472-7224.1, p.2]

Once EPA 'regulates' greenhouse gas emissions from mobile sources, the Clean Air Act requires that stationary sources be regulated under the threshold requirements as specified within the Clean Air Act - regardless of any 'tailoring rule' EPA develops - as those thresholds are specified within federal law. [OAR-2009-0472-7224.1, p .2]

Not only are states and local permitting authorities wholly unprepared for the millions of entities that will be required to comply with the Clean Air Act once greenhouse gas standards are set by EPA on light-duty vehicles, but EPA has failed to carefully evaluate the number of sources that could be affected once the light-duty vehicle GHG proposal goes into effect. We think that EPA has grossly underestimated the number and types of facilities that will be impacted by the light-duty vehicle greenhouse gas proposal by becoming subject to NSR pollutants and the Title V and PSD requirements. [OAR-2009-0472-7224.1, p.2]

For example, asphalt plants, typically considered as a small industrial source, would now become subject to Title V and PSD permitting as soon as greenhouse gases are regulated under the light-duty vehicle greenhouse gas standards. There are over 4,000 of these asphalt plants across the country. The same can be said of large malls and hotels, for example. Any source that emits more than 250 tons of carbon dioxide would now be subject to these stringent permitting programs, thereby increasing costs associated with paperwork, testing, and more importantly, control or mitigation technologies. Additionally, moving forward with this action will further exacerbate the economic downturn in the road construction and other small industries - some already in dire economic straits, by creating more uncertainty and greater operational expenses. [OAR-2009-0472-7224.1, p.2]

Our industry takes compliance with the Clean Air Act seriously. If it is not the intention of EPA to regulate relatively minor sources of greenhouse gas emissions, then the statutory language of the Clean Air Act must be amended, or specific and clear legislative efforts must be provided to

the states where these small sources operate. Inevitably, litigation will ensue. Our members, builders of the nation's roads, do not want to respond to litigation when their operations, as small industrial sources, are in compliance with the intent of the Clean Air Act - but not in conformity with existing statutory language that lags behind agency regulation. [OAR-2009-0472-7224.1, p.3]

EPA must not move forward with regulating greenhouse gas emissions under the light-duty vehicle proposal until its impact on small and minor industrial sources of greenhouse gas emissions are taken into account. EPA has indicated it is not the intent of the Agency to regulate industrial sources of greenhouse gas emissions below 25,000 tons annually. In fact, finalization of this rule will do just the opposite - it will require small industrial sources to comply with Title V and PSD permitting requirements, and potentially face a spate of litigation. [OAR-2009-0472-7224.1, p.3]

American Chemistry Council, American Iron and Steel Institute, American Meat Institute, Corn Refiners Association, National Oilseed Processors Association

EPA's Failure to Analyze the PSD and Title V Effects of Finalizing the Motor Vehicle Rule Runs Contrary to Procedural Requirements

Failure to account for the PSD and Title V implications of proposed Motor Vehicle Rule also violates the Regulatory Flexibility Act and the Paperwork Reduction Act. [NHTSA-2009-0059-0094.1, p.6] [[See Docket Number NHTSA-2009-0059-0094.1, pp.6-8 for a detailed discussion on this issue.]]

The PRA and the RFA promote overriding public interests in transparency and ensuring that costs imposed by agency actions are fully considered. These are not mere boxes for the Agency to check perfunctorily. Entities affected by agency actions depend on these safeguards in order to be kept abreast of rules that will impact them, and to know how to provide meaningful input. By ignoring the obvious, admitted, and enormous implications that this proposed Rule poses for stationary sources, EPA thwarts those public interests. [NHTSA-2009-0059-0094.1, pp.7-8]

Peabody Energy Company

EPA failed to address the economic and regulatory effects of making major sources subject to PSD regulation for their GHG emissions under a number of Executive Orders and statutes

Despite the large economic and regulatory consequences that the motor vehicle rule will have on major stationary sources, EPA unaccountably failed to produce the necessary studies of these effects in conformance with the relevant Executive Orders and statutes. The motor vehicle rule docket contains an RIA and certain other regulatory reviews, but these analyses are all confined to the direct benefits and effects of motor vehicle GHG regulation and do not address the PSD effects that motor vehicle regulation will automatically trigger. [OAR-2009-0472-7223.1, pp.5-6]

EPA seems to have been of the view when it promulgated the motor vehicle rule that it would address the PSD effects of that rule when it undertook the tailoring rulemaking. EPA did, in fact, produce analyses in the tailoring rule docket of PSD impacts of regulating GHG emissions under the CAA but only for small sources, not major sources. Indeed, EPA's RIA and other Executive Order and statutory reviews in the tailoring rule docket were all premised on the notion that the tailoring rule reduces costs associated with PSD, on the theory that the tailoring rule defers PSD and Title V regulation of small sources that would otherwise occur absent the rule. [OAR-2009-0472-7223.1, p.6]

Peabody will comment on that premise in its tailoring rule comments, but for purposes here EPA completely missed the point that the tailoring rule did not reduce or otherwise affect PSD regulation of major source GHG emitters (other than to define the major source threshold). As a result, none of the Executive Order and statutory reviews in the tailoring rule or motor vehicle dockets addressed the effect on major sources of making GHGs regulated CAA air pollutants through promulgation of the motor vehicle rule. [OAR-2009-0472-7223.1,p.6]

That failure is plain legal error. By regulating motor vehicle GHG emissions, EPA is automatically initiating PSD regulation of major source GHG emissions. EPA therefore has a responsibility under the Executive Orders and statutes discussed below to examine the economic and regulatory impacts of that decision. [OAR-2009-0472-7223.1,p.6]

Moreover, EPA's error is so fundamental that it can only be cured by EPA producing the necessary studies as a part of a re-noticed proposed motor vehicle rule. Each of the Executive Order and statutory reviews discussed below is required to be prepared at the time of the notice of proposed rulemaking and is intended to inform the public comment process. Particularly given the potentially very large costs that the motor vehicle rule will impose on major stationary sources and the economy in general, the public is entitled to have the benefit of EPA's analysis of these costs when it files comments on the motor vehicle rule. [OAR-2009-0472-7223.1, p.6]

Finally, it would be no defense for EPA to respond that it cannot at this time precisely monetize the cost of GHG BACT for large sources. In the first place, EPA did not take this position in its motor vehicle proposal. EPA's reason for not assessing PSD impacts in the motor vehicle rulemaking docket was not because of its inability to estimate BACT costs; it was because EPA evidently did not think of it. Moreover, the Executive Orders and statutes discussed below do not require precise monetization, only estimation to the best of EPA's ability. For instance, under Section 3(d) of Executive Order 12291, agencies are required to describe potential benefits and costs of the rule and to determine potential net benefits, including any benefits, effects, and net benefits that "cannot be quantified in monetary terms." [OAR-2009-0472-7223.1, p.6]

1. Executive Order 12291 – Federal Regulation. Executive Order 12291 provides that an agency promulgating a "major rule" must prepare, at the time of the notice of proposed rulemaking, an RIA setting forth essentially a cost-benefit analysis of the rule. EPA agrees that the motor vehicle rule is a major rule and prepared an RIA setting forth the costs and benefits of the rule. That analysis, however, did not discuss the costs and benefits of the PSD regulation that would be triggered automatically by the rule. Among the purposes of the RIA requirement is to ensure that "[a]administrative decisions shall be based on adequate information concerning the need for and

consequences of proposed government action." Since one of the main consequences of regulating motor vehicle GHG emissions is PSD regulation of large source GHG emissions, EPA should have included those costs in its motor vehicle RIA. [OAR-2009-0472-7223.1, p.7]

2. Executive Order 12866 – Regulatory Planning and Review. Under Executive Order 12866, agencies are required to specify to the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and Budget any actions that the agency believes are "significant regulatory actions." If the agency or OIRA concludes that an action is a "significant regulatory action," the agency is required to submit to OIRA the analysis set forth in Section 6(a)(3)(B). If the agency action is a "significant regulatory action" because it will "[h]ave an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities," the agency is required to submit the more detailed analysis under Section 6(a)(3)(C). EPA concluded that the motor vehicle rule is a significant regulatory action under Executive Order 12866 but the analysis was legally deficient because it did not examine PSD impacts on large sources. [OAR-2009-0472-7223.1, p.7]

3. Executive Order 13211 – Energy Effects. Executive Order 13211 requires that agencies produce a Statement of Energy Effects whenever they take a "significant energy action," defined as one that is a significant regulatory action under Executive Order 12866 and is "likely to have a significant adverse effect on the supply, distribution, or use of energy." The motor vehicle preamble says that a Statement of Energy Effects was not required because the rule will not adversely affect the supply, distribution or use of energy, and will in fact have a positive effect through improved automobile fuel economy. Again, however, this conclusion was reached without consideration of PSD effects on major sources. As set forth above, EPA states that, even with the tailoring rule limitations, almost all of the nation's electric generating and oil refining fleets will become subject to PSD regulation for their GHG emissions. It is inarguable that this regulation will impose costs and therefore potentially affect the supply, distribution or use of energy. At least EPA must examine the issue. [OAR-2009-0472-7223.1, p.7]

4. Unfunded Mandates Reform Act (UMRA). UMRA applies to any Federal mandate that may result in the expenditure by State, local and tribal governments, in the aggregate, or by the private sector of $100,000,000 or more. An agency proposing such a mandate must produce the analysis required by Section 202(a). [OAR-2009-0472-7223.1, p.8]

The motor vehicle preamble states that UMRA does not apply to the motor vehicle rule as to possible impacts to state, local or tribal governments but that it does apply as to impacts to the private sector. It states that impacts to the private sector are analyzed in its RIA, but as noted above, that RIA is deficient because it does not consider PSD impacts. [OAR-2009-0472-7223.1, p.8]

Additionally, EPA's conclusion that UMRA does not apply as to impacts on state governments is incorrect. For the reasons discussed above, the tailoring rule does not automatically prevent small sources from being subject to PSD regulation in "most states," that is, those that administer their own PSD programs subject to EPA approval. In order for small sources not to be subject to PSD regulation for their GHG emissions in those states, the states must amend their laws and

regulations setting forth the 100/250 tpy and zero significance levels. [OAR-2009-0472-7223.1, p.8]

As a result, under the tailoring rule standing alone, state permitting agencies will be overwhelmed with new PSD permit applications. Although states may change those laws, those that wish to do so will require some time to amend their PSD rules through rulemaking and/or legislation. Thus, notwithstanding the tailoring rule, making GHGs regulated air pollutants through adoption of the motor vehicle rule could have very large and immediate consequences for state governments in overwhelming their permit systems before they can make the necessary rule changes. These consequences must be examined under UMRA. [OAR-2009-0472-7223.1, p.8]

5. Executive Order 13132 – Federalism. Executive Order 131312 applies to "policies that have federalism implications," defined as regulations and other agency actions that have "substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government." Agencies may not promulgate regulations that have federalism implications unless the federal government funds the States' costs or the agency consults with the States and provides, in the notice of proposed rulemaking, the statement set forth in Section 6(b)(2)(B). The motor vehicle rule preamble states that EPA does not have to provide this statement because the motor vehicle rule does not impose mandates on any States. However, for the reasons just discussed, the motor vehicle rule does impose significant PSD permit burdens on states. EPA therefore should have provided the relevant statement under Executive Order 13132. [OAR-2009-0472-7223.1, p.8]

6. CAA § 317. Section 317 provides that EPA must prepare an economic impact assessment before publishing a notice of proposed rulemaking in the federal register for certain specified types of rules. Under Section 317(a)(4), such a statement is required for "any regulation under part C of subchapter I of this chapter (relating to prevention of significant deterioration of air quality)." [OAR-2009-0472-7223.1, pp.8-9]

Because the motor vehicle rule makes GHGs subject to CAA regulation for the first time, and therefore triggers PSD regulation of GHGs for the first time, there is no question that the rule is both a Section 202(a) rule and a PSD rule under part C. Accordingly, EPA was required to but failed to produce the necessary economic impact assessment. [OAR-2009-0472-7223.1, p.9]

7. Regulatory Flexibility Act (RFA). The RFA generally requires that an agency prepare a regulatory flexibility analysis for any rulemaking unless it certifies that the rule will not have a significant economic impact on a substantial number of small entities. The motor vehicle preamble concluded that the rule would not cause such an impact because the rule was only targeted at large automakers. EPA, however, did not examine how many small entities within the meaning of the RFA are major sources of GHG emissions that would be subject to PSD regulation. Until that analysis is performed, EPA has no basis to conclude that it is not required to prepare a regulatory flexibility analysis. [OAR-2009-0472-7223.1, p.9]

EPA Response:

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities subject to the rule. If a covered agency, such as EPA, is unable to certify a rule at proposal, they must conduct a Small Business Advocacy Review (SBAR) panel.

If an agency certifies that the rule at issue does not have a significant impact on a substantial number of small entities (SISNOSE), the agency is not required to undertake any regulatory flexibility analyses or conduct a SBAR panel. When considering whether or not a rule should be certified at proposal stage, the RFA requires the agency to look only at the "small entities to which *the proposed rule* will apply" and small entities "subject to *the requirement*" of the specific rule in question. 5 U.S.C. § 603(b) (emphases added).[62] Though the agency must have a "factual basis" for this certification, that factual basis can be supported by the fact that the rule "does not directly regulate any small entities." *ATA v. EPA*, 175 F.3d 1027, 1045 (D.C. Cir. 1999).

Courts have "consistently rejected the contention that the RFA applies to small businesses indirectly affected by the regulation of other entities." *Cement Kiln Recycling Coalition v. EPA*, 255 F.3d 855, 869 (D.C. Cir. 2001). The D.C. Circuit has previously addressed an RFA claim in the context of motor vehicle regulation, and held that EPA was not required to conduct RFA analyses where the rule did not directly impose requirements on small automobile manufacturers. *Motor & Equipment Mfrs. Ass'n v. Nichols (MEMA)*, 142 F.3d 449, 467 (D.C. Cir. 1998) (EPA is only "obliged to consider the impact of the rule on small automobile manufacturers subject to the rule").

This rule, as did the rule in *MEMA*, regulates exclusively large motor vehicle manufacturers and thus has no direct impacts on *any* small entities.[63] EPA recognizes that in some cases the Clean Air Act will require application of PSD permitting requirements to GHG emissions when the regulatory requirement to control those emissions "takes effect" under this rule. However, those permitting requirements are imposed by operation of section 165 of the Clean Air Act and are not imposed by the regulatory requirements contained in this separate regulatory action under section 202(a) (1). EPA is not required to base its certification decision on indirect impacts

[62] Likewise, in discussing the consideration of significant alternatives to the proposed rule in an initial regulatory flexibility analysis, the RFA refers to the "establishment of differing … requirements" that take into account the resources available to small entities, the simplification of "requirements under the rule for such small entities," and "an exemption from coverage of the rule … for such small entities."

[63] Small manufacturers are exempted from the GHG standards and other regulatory requirements adopted in this final rule. For the proposal, a limited number of small entities were subject to a proposed reporting requirement, but the economic impact of that proposed regulatory requirement was clearly not significant. EPA proposed to exempt small manufacturers and other entities from the GHG standards and other regulatory requirements, and the only proposed regulatory requirement they were subject to was a one-time reporting obligation to obtain such exemption. This single regulatory requirement did not have a significant economic impact. For the proposal, EPA was not required to consider the indirect impacts on these small entities of other requirements that were not contained in the proposed rule, but instead flow from the operation of other provisions of the CAA. EPA properly based its NOSISNOSE certification for the proposal on the lack of significant impact imposed by the regulations themselves on small entities subject to the proposed rule. For the final rule, EPA is not adopting this proposed one-time reporting requirement, as it is not needed.

imposed on parties that are not subject to the regulatory requirements of this rule, such as parties that are not motor vehicle manufacturers. EPA properly bases its certification by considering the impacts of the regulatory requirements contained in the proposed and final rule, determining whether these regulatory requirements themselves imposed a significant impact on a substantial number of small entities subject to the rule.

As this rulemaking is limited to issues involved in setting emissions standards for large motor vehicle manufacturers, EPA would not be able to account for any potential indirect impacts from separate statutory requirements on entities not directly subject to or impacted by this rule. Even where a rule could "doubtless have economic impacts in many sectors of the economy," courts have refused to "convert every rulemaking process into a massive exercise in economic modeling" by requiring a full RFA analysis. *Cement Kiln Recycling Coalition v. EPA*, 255 F.3d 855, 869 (D.C. Cir. 2001).

Although the RFA does not apply to this action, EPA recognized that some small entities were concerned about the potential indirect impacts of the statutory imposition of PSD requirements that may occur given the various EPA rulemakings concerning greenhouse gas emissions. In the interest of providing small entities a forum to express their concerns in addition to the opportunity provided in the notice and comment process, EPA used the discretion afforded to it under section 609(c) of the RFA to consult with OMB and SBA, with input from outreach to small entities, regarding the potential impacts of PSD regulatory requirements on small entities that might occur as EPA considers regulations of GHGs.

Section 609(c) of the RFA allows agencies to, in their discretion, apply the provisions of the RFA that address SBAR panels to a rule that "the agency intends to certify… but the agency believes *may* have a greater than de minimis impact on a substantial number of small entities." 5 U.S.C. § 609(c) (emphasis added).[64] EPA does not believe that the use of this discretion requires a rigid application of the entirety of section 609(c). Instead, agencies may pick and choose elements of the SBAR panel process to apply as they deem appropriate for the rule at issue.

EPA believes that section 609(c) of the RFA authorizes agencies to engage in outreach similar to that of a formal SBAR panel where, as in this action, the RFA would not otherwise apply due to the certification of the rule.[65] EPA maintains that this action does not have *any* significant impacts on small entities directly subject to the rule, and EPA's use of 609(c) does not indicate otherwise. As indicated by the word "may," an agency has discretion to invoke this provision in a variety of circumstance and is not limited to those situations where it is certain that a rule has a greater than de minimis impact.

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[64] One commenter misunderstood this provision, believing that Section 609(c) only authorizes agencies to forgo an Initial Regulatory Flexibility Analysis (IRFA). This is not an accurate reading of the statute. Section 609(c) applies where agencies certify that a rule will have no SISNOSE under 605(c). When an agency certifies no SISNOSE under 605(c), they are not obligated to conduct an IRFA. Since the 609(b) SBAR panel requirements are triggered only when EPA is "required to conduct" an IRFA, Section 609(c) discretion applies only to the SBAR panel process provisions of 609(b), but not the substantive IFRA requirement. The 4th Cir. opinion referenced by the commenter does not involve agency use of section 609(c) and has no meaningful bearing on the matter at hand.

[65] EPA does *not* believe that section 609(c) of the RFA offers agencies a chance to circumvent the panel process where they do not intend to certify that the rule does not have a SISNOSE, and EPA remains committed to holding SBAR panels where contemplated by the RFA.

Commenters have cited almost no case law to support their claim that EPA has violated the RFA.[66] One case, *Aero. Repair Station Ass'n v. F.A.A.*, 494 F.3d 161 (D.C. Cir. 2007), is plainly distinguishable from this action. In *Aero. Repair*, the FAA certified a regulation that imposed requirements on "employer air carriers", but which also "expressly require[d] that the employees of contractors and subcontractors be tested" under the regulation. *Id.* at 177. FAA argued that since the phrase "employer air carriers" did not include contractors and subcontractors, they were not required to consider impacts on contractors and subcontractors in fulfilling their RFA obligations. The court rejected the claim, finding that "the *2006 Final Rule* imposes responsibilities directly on the contractors and subcontractors." *Id.* (emphasis added).[67]

In this action, the only entities that have responsibilities under this rule are motor vehicle manufacturers, and the rule explicitly exempts small motor vehicle manufacturers from those responsibilities. No other entities, whether implicitly or explicitly, have *any* responsibilities under this rule. EPA will not enforce this rule against anyone other than the large automobile manufacturers subject to it.

Accordingly, EPA maintains that it has fully complied with the requirements of the Regulatory Flexibility Act in this action. Because this rule does not significantly impact a substantial number of small entities that are subject to the rule, EPA has statutory authority to certify this rule under the RFA. Thus, EPA was not required to conduct a SBAR panel or any regulatory flexibility analyses.

EPA rejects the argument that it needs to provide additional analyses beyond that in the Regulatory Impact Analysis, to be responsive to various Executive Orders on analyses of the costs and benefits of this rule. These Executive Orders call for EPA to analyze the impacts of this rule and its requirements, not indirect impacts of statutory requirements that flow from this rule. Likewise, compliance with UMRA and Executive Order 13132 are properly focused don the impacts of this rule on States, not the impacts of indirect effects that flow from this rule. Finally, EPA believes that its RIA satisfies the requirements of Section 317 of the Act, which calls for an analysis of the impacts of the requirements imposed by this rule, not indirect effects that flow from it.

The various comments on consideration of the economic impacts of the PSD permitting provisions fail to recognize that any analysis of such impacts would not aid EPA in determining what GHG standards to adopt in this rulemaking. They are not related to any of the issues EPA needs to consider and decide in determining the content of the GHG standards that will apply to automobile manufacturers. EPA has addressed elsewhere the separate issue of whether EPA should delay issuance of this rule because of concerns raised over PSD permitting.

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[66] EPA is not aware of a prior situation where EPA voluntarily conducted a SBAR panel where the regulatory action at hand triggered a subsequent statutory obligation, and commenters have not indicated otherwise. Although EPA is aware of a handful of examples of other agencies voluntarily engaging in regulatory flexibility analyses where their regulatory action arguably triggered a statutory obligation, we note that none of those agencies conducted a SBAR panel prior to proposal. In addition, any analyses they completed were post proposal. *See e.g.* 71 Fed. Reg. 8,265 (Feb. 16, 2006).

[67] It is also worth noting that the FAA is not a covered agency under the RFA, and thus is not required to complete an SBAR panel.

5.15. Comments on EPA Regulatory Text

Organization: Chrysler Group LLC (Chrysler)
Alliance of Automobile Manufacturers (Alliance)
New York State Department of Environmental Conservation

Comment:

Chrysler Group LLC (Chrysler):

Clarity of Intent

The intent of the proposed regulatory text is unclear in several cases and additional clarity is required. The following comments are provided. [NHTSA-2009-0059-0124, p.39] [[See NHTSA-2009-0059-0124, pp.39-41 for detailed comments regarding the regulatory text]]

Definitions

The following concerns were noted with the definitions given in the proposed regulatory text. [[See NHTSA-2009-0059-0124, p.42 for detailed comments regarding the definitions in the proposed regulatory text]]

Reference to Appropriate Greenhouse Gas Metric

Throughout the proposed regulatory text, a variety of greenhouse gas metrics are referred to (CO2, CO2-equivalent, and CREE). The intermingling of terms can cause confusion, especially in cases where it is unclear whether actual CO2 emissions are meant or whether a metric which includes CO2 emissions is meant. Chrysler recommends that the proposed regulatory text only use the exact term meant in each instance. [NHTSA-2009-0059-0124, p.42]

The following instances were identified where the apparent intended metric was CREE, but an alternative greenhouse gas metric was specified. [[See NHTSA-2009-0059-0124, p.42 for detailed comments regarding the regulatory text]]

Reference Issues

Some references within the regulatory text appear to be incorrect. [[See NHTSA-2009-0059-0124, p.43 for detailed comments regarding the regulatory text]]

Regulatory Text Changes Are Indicated, but Could Not Be Identified

In several instances, the NPRM indicated that modifications had been made to regulatory text from previously existing language, but Chrysler could not identify the difference between the original and proposed text. [NHTSA-2009-0059-0124, p.43]

86.1803-01 Round, Rounded, or Rounding: Comment 11 notes that the definition is revised, but no difference could be identified.

86.1841-0 1 (b): Comment 21 notes that paragraph (b) is revised, but no difference could be identified. [NHTSA-2009-0059-0124, p.43]

Alliance of Automobile Manufacturers (Alliance):

Net Heating Value (NHV) Determinations (Proposed regulations in 40 C.F.R. 600.113-08 and 600.510-12)

In the proposed 40 C.F.R. 600.113-08(f)(4)(iii) and again in 40 C.F.R. 600.510(g)(1)(ii)(A), EPA proposed to use the ASTM D 240-92 test method for determining the NHV for ethanol and alcohol fuels. [OAR-2009-0472-6952.1, p.53]

The current practice for determining NHV for gasoline is ASTM D 3338-92 which has superior precision as compared to that of ASTM D-240. ASTM D 3338 has repeatability and reproducibility of 9 Btu/lb and 20 Btu/lb respectively, whereas ASTM D-240 has repeatability and reproducibility of 56 Btu/lb and 172 Btu/lb respectively. The two methods are not equivalent and if the new procedure (ASTM D-240) is adopted, a bias in fuel properties can be assumed. [OAR-2009-0472-6952.1, p.53]

Recommendation:

The current ASTM D3338 process for determining the Net Heating Value (NHV) should be retained for fuels with ethanol blends that are ≤10%. For fuels that have a greater than 10% ethanol composition, EPA should work with industry on an acceptable method for determining NHV, possibly with a modified ASTM D 3338 calculation and a sample for distillation of the gasoline portion of the fuel. [OAR-2009-0472-6952.1, p.53]

New York State Department of Environmental Conservation

Apparent Internal Citation Errors (Federal Register Notice pages 49759-49762)
The proposed language for §86.1848-10(c)(9). includes reference to §86.1865-12(k)(7) for the procedure to be used to determine the vehicles deemed to have been sold in violation of the fleet average C02 standards, in the event a manufacturer does violate those standards. This procedure is found in §86.1865-12(k)(8). Similarly there are other references to paragraph §86.1865-12(k)(7) in §86.1865-12(j) and (k) that appear to more properly refer to §86.1865-12(k)(8). [OAR-2009-0472-7454, p.4]

Carbon Related Exhaust Emissions Formula (Proposed Amendments to Section 600.113-08)
EPA includes the CO2 formed from hydrocarbons and CO as C02 regulated by this standard. We concur with this approach. However the proposed Carbon Related Exhaust Emission equations in 600.113-08(h) reduce hydrocarbons to carbon rather than carbon dioxide. [OAR-2009-0472-7454, p.5]

The formula for calculating carbon related exhaust emissions (CREE) contain an error in the hydrocarbon term. The equation follows: [OAR-2009-0472-7454, p.5]

CREE = CWF(HC) + 1.571(CO) + (CO2) [OAR-2009-0472-7454, p.5]

The purpose of the 1.571 factor for carbon monoxide is to convert the mass of CO to the mass of an equivalent number of moles of C02. However, the hydrocarbon term is multiplied by the carbon weight fraction, which converts to the mass of an equivalent number of moles of carbon. Another representation of the proposed equation is: [OAR-2009-0472-7454, p.5]

CREE = CWF(HC) +(44/28)(CO) + (44/44) (CO2) [OAR-2009-0472-7454, p.5]

To properly express CREE on a consistent basis as CO2, the equation should be: [OAR-2009-0472-7454, p.5]

CREE = CWF (44/12) (HC) + (44/28) (CO) + (44/44) (CO2) [OAR-2009-0472-7454, p.5]

Or:

CREE = 3.667(CWF)(HC) + 1.571(CO) + (C02) [OAR-2009-0472-7454, p.5]

There appear to be similar errors in the hydrocarbon terms for other, non-gasoline, fuels. [OAR-2009-0472-7454, p.5]

EPA Response:

Comments will be addressed below on the following topics: ASTM Test Procedure to Determine the Net Heating Value for Methanol and Ethanol; and Regulatory Text Clarifications.

ASTM Test Procedure to Determine the Net Heating Value for Methanol and Ethanol: EPA proposed revisions to paragraphs §600.113-08(f)(2)(iii), §600.113-08(f)(4)(iii) and §600.510(g)(1)(ii)(A), regarding the net heating value (NHV) used for methanol and ethanol fuels. The proposed regulation changes required manufacturers to use ASTM D 240-92 test method to determine the NHV for ethanol and methanol fuels.

Comments submitted by the Alliance indicated that that "The current practice for determining NHV for gasoline is ASTM D 3338-92 which has superior precision as compared to that of ASTM D-240. ASTM D 3338 has repeatability and reproducibility of 9 Btu/lb and 20 Btu/lb respectively, whereas ASTM D-240 has repeatability and reproducibility of 56 Btu/lb and 172 Btu/lb respectively. The two methods are not equivalent and if the new procedure (ASTM D-240) is adopted, a bias in fuel properties can be assumed." The Alliance recommended that "The current ASTM D3338 process for determining the Net Heating Value (NHV) should be retained for fuels with ethanol blends that are ≤10%. For fuels that have a greater than 10% ethanol composition, EPA should work with industry on an acceptable method for determining NHV, possibly with a modified ASTM D 3338 calculation and a sample for distillation of the gasoline portion of the fuel."

EPA agrees with the Alliance comments and has corrected the regulations in the final rule accordingly. The reference to ASTM D 240-92 is not needed in paragraphs §600.113-08(f)(2)(iii) and (f)(4)(iii) and does not appear in the final rule (because NHV is not used in the fuel economy equation for vehicles operated on ethanol or methanol fuels). Paragraph §600.510(g)(1)(ii)(A) reads in the final rule as follows:

> **"(ii)(A) The net heating value for alcohol fuels shall be premeasured using a test method which has been approved in advance by the Administrator."**

EPA intends to work with the Industry to help develop an appropriate test procedure to determine the NHV of alcohol fuels.

Regulatory Text Clarifications: Chrysler and the New York Department of Environmental Conservation submitted a list of paragraphs in the proposed regulations which Chrysler believes to be ambiguous, to contain typographical mistakes, or to contain incorrect regulatory references. EPA has made appropriate corrections in response. In addition, Chrysler commented that "Throughout the proposed regulatory text, a variety of greenhouse gas metrics are referred to (CO2, CO2-equivalent, and CREE). The intermingling of terms can cause confusion, especially in cases where it is unclear whether actual CO2 emissions are meant or whether a metric which includes CO2 emissions is meant. Chrysler recommends that the proposed regulatory text only use the exact term meant in each instance."

EPA appreciates the comments about the errata in the regulations, and the final rule has corrected the regulations, accordingly. The final rule also contains a number of minor amendments to update the regulations as needed and to ensure that the regulations are consistent with changes discussed in the preamble to the final rule. Regarding Chrysler's comment about the intermingling of CO2 and CREE terms, the final rule revised most of the CO2 emission references to carbon-related exhaust emissions (CREE) references, where appropriate. The GHG emission standards still refer to a CO2 standard (although CREE emissions are measured and compared to the CO2 standard) because a CO2 standard is easier for the general public to understand. To prevent confusion about this concept, the final rule revised the CREE definition contained in §600.002-08, to read as follows:

> **§600.002-08 Definitions.**
>
> *Carbon-related exhaust emissions (CREE)* means the summation of the carbon-containing constituents of the exhaust emissions, with each constituent adjusted by a coefficient representing the carbon weight fraction of each constituent, as specified in §600.113-08. For example, carbon-related exhaust emissions (weighted 55 percent city and 45 percent highway) are used to demonstrate compliance with fleet average CO_2 emission standards outlined in §86.1818(c).

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7. Other Comments

7.1. Stationary Source and Permitting Issues

Organization: Air Permitting Forum
Alliance of Automobile Manufacturers (Alliance)
American Chemistry Council (ACC)
American Farm Bureau Federation (AFBA)
American Forest and Paper Association (AF&PA)
American Iron and Steel Institute
American Meat Institute
American Petroleum Institute
Arizona Public Service
BCCA Appeal Group (the Group)
Brick Industry Association
California Cotton Ginners Association (CCGA)
Charleston Metro Chamber of Commerce
Consumers Energy
Corn Refiners Association
Council of Industrial Boiler Owners (CIBO)
County of Greenville, SC
Dow Chemical Company (Dow)
Duke Energy
Edison Electric Institute
Energy-Intensive Manufacturers Working Group
Fertilizer Institute
Georgia Department of Natural Resources
Georgia-Pacific (GP)
Industry Coalition
Mass Comment Campaign (48 comments) (unknown organization)
Mississippi Department of Environmental quality
National Association of Home Builders (NAHB)
National Association of Manufacturers
National Climate Coalition
National Cotton Ginners Association
National Mining Association (NMA)
National Oilseed Processors Association
National Petrochemical & Refiners Association
NISEI Farmers League
Peabody Energy Company
SCANA Corporation
Sierra Research Inc.
South Carolina Chamber of Commerce
South Carolina Department of Health and Environmental Control
South Carolina Manufacturers Alliance (SCMA)
South Carolina Pulp & Paper Association (SCPPA)

Southeastern States Air Resources Managers, Inc. (SESARM)
Spurgeon, C. M.
Stanton, Neil
Texas Chemical Council (TCC)
Texas Cotton Ginners Association
Texas Department of Agriculture
Texas Industry Project (TIP)
Texas Oil and Gas Association
Utility Air Regulatory Group
Western Agricultural Processors Association
Wood, John

Comment:

Air Permitting Forum

The Air Permitting Forum believes that comprehensive climate legislation is far preferable to using the existing Clean Air Act case-by-case permitting programs to address GHG emissions. These permitting programs are resource-intensive for both regulated entities and regulators. Moreover, in an arena in which efficiency is the key to reducing impacts, the case by-case nature of the PSD and Title V programs indicates that they are perhaps the least efficient mechanisms to mitigate the effects of climate change. In sum: [OAR-2009-0472-7253.1, p.1]

[See Docket Number OAR-2009-0472-7253.1, pp.1-2 for detailed comments on the introduction]

EPA's Assumption that the Section 202 Rule Will Automatically Trigger PSD Permitting for Sources Solely Based on Their Emissions of Greenhouse Gases Is Incorrect
The common wisdom is that the Clean Air Act and the PSD regulations require EPA to subject to PSD review any source that is major and any modification of a major source above significance levels for any pollutant. The only exception this conventional wisdom allows is for nonattainment pollutants. [OAR-2009-0472-7253.1, p.2]

[See Docket OAR-2009-0472-7253.1, pp.2-5 for detailed comments pertaining to: Background, Relevant Statutory and Regulatory Applicability Provisions, Sections 161 and 165(a) Limit PSD Applicability Based on the Location of the Source and Case Law Confirms This Limitation, and EPA Can Implement the Proper Scope of PSD Applicability Under the Existing Regulations]

EPA Has Not Properly Accounted for the Costs of This Regulatory Action
As discussed above, the Clean Air Act and the PSD regulations are structured such that PSD should only impose BACT for GHGs on sources that are otherwise required to obtain a PSD permit based on their emissions of a NAAQS pollutant. To the extent that EPA continues in its view that PSD will be triggered and sources will be classified as

major for PSD solely on the basis of GHG emissions, the Agency must properly analyze those impacts in this rulemaking. [OAR-2009-0472-7253.1, p.5] EPA has acknowledged in the Proposed Tailoring Rule that, under its interpretation of the PSD applicability provisions, some 40,000 sources would be subject to PSD (an estimate that we believe is low). [OAR-2009-0472-7253.1, p.6]

[See Docket OAR-2009-0472-7253.1, pp.5-7 for detailed comments pertaining to: If EPA Does Not Adopt the Proper Interpretation of the PSD Program's Scope, It Must Include the Costs of Triggering PSD in Its Section 202 Rulemaking Analysis and Regardless of the Interpretation of the PSD Provisions, EPA Must Include the Costs of Triggering Title V Permitting for Stationary Sources in Its Section 202 Rulemaking Analysis]

Alliance of Automobile Manufacturers (Alliance)

Concerns with EPA's Position on Implications for Stationary Source Programs Under the Clean Air Act

EPA has stated in the NPRM that the issuance of regulations under Section 202 of the Clean Air Act will trigger application of the Prevention of Significant Deterioration (PSD) program of the CAA for stationary sources. 74 Fed. Reg. 49,629. EPA has reiterated this interpretation of CAA Section 165 in its proposal regarding reconsideration of the so-called Johnson Memo (74 Fed. Reg. 51,535, October 7, 2009) and in its proposal on the so-called Tailoring Rule for PSD (74 Fed. Reg. 55,292, October 27, 2009). [OAR-2009-0472-6952.1, p.68]

None of the three Federal Register notices cited above contain a thorough discussion of EPA's legal and policy options with regard to Section 165, nor have they addressed the regulatory impact of automatically and immediately triggering PSD on the sources that would be directly affected. Instead, EPA has focused narrowly on the "benefits" of "tailoring" the threshold emissions amount to 25,000 tons for PSD and Title V permitting. [OAR-2009-0472-6952.1, p.69]

The Alliance does not request, and would not support, delaying the final mobile source rule in order to address concerns regarding the implications for stationary sources. Having said that, the Alliance also believes that the implications of the mobile source rule for stationary sources have not been adequately addressed by the Agency, and need further analysis. [OAR-2009-0472-6952.1, p.69]

The Alliance urges EPA to deal with this issue within the confines of the Johnson Memo and PSD Tailoring rules, as is the Agency's apparent intent. The Alliance urges EPA to consider ways to avoid the automatic application of the PSD program to stationary sources. Moreover, to the extent that EPA concludes the application of PSD for GHGs is inevitable upon issuance of Section 202 regulations, the Agency should more thoroughly analyze the impacts of the PSD program in the context of the Johnson Memo and PSD Rulemakings. The Alliance does not believe that the Clean Air Act compels EPA to automatically and immediately trigger PSD as a result of the mobile source rule. Further

discussion of the legal and policy issues will be provided in Alliance comments on those later proposals. [OAR-2009-0472-6952.1, p.69]

American Chemistry Council (ACC)

EPA Must Assess and Address the Motor Vehicle Rule's Impacts on Stationary Sources Before Finalizing the Rule.
EPA's failure to account for the Title V and PSD consequences of finalizing the Motor Vehicle Rule would render the final Rule both arbitrary and capricious, and also invalid based on other procedural requirements for rulemaking. [OAR-2009-0472-7148.1, p.2]

The Associations acknowledge EPA's desire to address GHG emissions from mobile sources quickly, as well as NHTSA's need to set new fuel economy standards, which must be promulgated at least 18 months before the affected model year (in this case the 2012 model year). 49 U.S.C. § 32902(g)(2). However, as proposed, the Motor Vehicle Rule ignores the enormous burdens the Rule would impose on stationary sources. This omission violates legal requirements for agency rulemaking, constitutes arbitrary and capricious action, and is simply bad policy. This is especially so because nearly all the environmental benefits EPA says will result from its promulgation of the Motor Vehicle Rule under CAA authority would also result from the NHTSA rule alone. Yet, unlike NHTSA action to raise corporate average fuel economy (CAFE) standards, the redundant EPA standards promulgated under the CAA would have regulatory impacts reaching far beyond the automotive industry and would impose billions of dollars in additional permitting and compliance costs. [OAR-2009-0472-7148.1, p.2]

Thus, although the Associations take no position on NHTSA's proposal to increase CAFE standards, we vigorously object to EPA's proposal to finalize the superfluous Motor Vehicle Rule under CAA Section 202. EPA's failure to account here for the PSD and Title V burdens it elsewhere acknowledges will flow from this rulemaking renders this rulemaking legally invalid. EPA must fully consider those burdens in this rulemaking. [OAR-2009-0472-7148.1, p.2]

[See Docket number OAR-2009-0472-7148.1, cover page 1-2 for detailed comments]

[See Docket OAR-2009-0472-7148.1, pp. 2-8 for detailed comments pertaining to: EPA's failure to Analyze the PSD and Title V Effects of Finalizing the Motor Vehicle Rule Is Arbitrary and Capricious and EPA's Failure to Analyze the PSD and Title V Effects of Finalizing the Motor Vehicle Rule Runs Contrary to Procedural Requirements]

PSD Permitting Requirements Need Not and Should Not Apply to Stationary Sources' GHG Emissions Solely by Virtue of EPA Finalizing the Motor Vehicle Rule
EPA could properly decline to consider the PSD impacts of the proposed Motor Vehicle Rule in this rulemaking docket only if those impacts would not, in fact, result from the Rule. EPA has stated that PSD requirements will be triggered when the proposed Motor Vehicle Rule first subjects GHG emissions from cars to control—that is, model year 2012. See PSD Interpretive Memo Reconsideration, 74 Fed. Reg. at 51545–46. But EPA

can interpret the statute and regulations to avoid that result and eliminate the need to analyze the proposed Motor Vehicle Rule's effect on stationary sources in this proceeding. Moreover, by doing so, EPA would eliminate the need for the legally questionable GHG Tailoring Rule. [OAR-2009-0472-7148.1, p.8]

[See Docket OAR-2009-0472-7148.1, pp. 8-12 for detailed comments pertaining to: EPA's View that Issuance of the Motor Vehicle Rule Automatically Triggers PSD Based Solely on Emissions of GHGs Is Inconsistent with the Plain Meaning of the CAA and EPA's Regulations and The Phrase 'Pollutants Subject to Regulation' Is Also Most Reasonably Interpreted to Exclude GHGs]

EPA Should Exercise its Discretion to Defer Finalizing a Motor Vehicle Rule
EPA has clear legal authority to defer promulgation of an emission standard under CAA Section 202, even if the Agency proceeds in the near future to finalize a positive endangerment finding under CAA Section 202. It would be arbitrary and capricious for EPA not to exercise that authority because the potential economic consequences of the Motor Vehicle Rule are massive, and unquestionably outweigh any environmental benefits that would flow from EPA placing its imprimatur on the NHTSA rule. [OAR-2009-0472-7148.1, p.12]

[See Docket OAR-2009-0472-7148.1, pp. 12-14 for detailed comments pertaining to: Nothing Compels EPA to Finalize GHG Emissions Standards for Mobile Sources, Nothing Compels EPA to Finalize GHG Emissions Standards for Mobile Sources, There Are Numerous Compelling Reasons to Defer the Motor Vehicle Rule, and EPA Should Not Proceed Under CAA Section 202 Until the Agency Considers Acting Under CAA Section 115]

American Chemistry Council, American Iron and Steel Institute, American Meat Institute, Corn Refiners Association, National Oilseed Processors Association

The Associations and their members represent a sizeable and diverse collection of commercial interests. The Motor Vehicle Rule would have a substantial and direct effect on the Associations' members. The Motor Vehicle Rule, if finalized, would purport to subject greenhouse gases ("GHGs") to regulation under the Clean Air Act (CAA) for the first time. As a result, under EPA's current interpretation of its regulations, the Rule would trigger Title V and Prevention of Significant Deterioration (PSD) permitting and emission-control requirements for millions of stationary sources owned and operated by the Associations' members. These Title V and PSD requirements would impose unprecedented costs and burdens on the Associations' members, EPA, and state regulatory authorities. [NHTSA-2009-0059-0094.1, p.1]

The Associations acknowledge EPA's desire to address GHG emissions from mobile sources quickly, as well as NHTSA's need to set new fuel economy standards, which must be promulgated at least 18 months before the affected model year (in this case the 2012 model year). 49 U.S.C. § 32902(g)(2). However, as proposed, the Motor Vehicle Rule ignores the enormous burdens the Rule would impose on stationary sources. This

omission violates legal requirements for agency rulemaking, constitutes arbitrary and capricious action, and is simply bad policy. This is especially so because nearly all the environmental benefits EPA says will result from its promulgation of the Motor Vehicle Rule under CAA authority would also result from the NHTSA rule alone. Yet, unlike NHTSA action to raise corporate average fuel economy (CAFE) standards, the redundant EPA standards promulgated under the CAA would have regulatory impacts reaching far beyond the automotive industry and would impose billions of dollars in additional permitting and compliance costs. [NHTSA-2009-0059-0094.1, pp.1-2]

Thus, although the Associations take no position on NHTSA's proposal to increase CAFE standards, we vigorously object to EPA's proposal to finalize the superfluous Motor Vehicle Rule under CAA Section 202. EPA's failure to account here for the PSD and Title V burdens it elsewhere acknowledges will flow from this rulemaking renders this rulemaking legally invalid. EPA must fully consider those burdens in this rulemaking. [NHTSA-2009-0059-0094.1, p.2]

Alternatively, EPA could defer finalizing the proposed Motor Vehicle Rule at this time. EPA has ample authority and discretion to do so. And if EPA deferred, NHTSA still could finalize its regulations, yielding nearly all the emissions reductions that EPA seeks through the Motor Vehicle Rule, and none of the adverse PSD consequences. Moreover, deferring action on this rulemaking would permit EPA to fully consider the burdens associated with regulating GHGs under the CAA. EPA obviously has not performed or considered this analysis, and instead has improperly deflected comments on these consequences to the proposed GHG Tailoring Rule, which is inadequate to the task. EPA would abuse its discretion and act arbitrarily if it rushes to finalize the Motor Vehicle Rule before conducting the proper analysis. [NHTSA-2009-0059-0094.1, p.2]

There are, however, several ways in which the unprecedented PSD implications of the Motor Vehicle Rule could be avoided. First, EPA could interpret its PSD authority to ensure that only pollutants for which a National Ambient Air Quality Standard (NAAQS) has been set trigger PSD permitting requirements. This interpretation is faithful to the plain text of the CAA and EPA regulations, as well as Congress' original vision for the PSD program. Moreover, this interpretation would allow EPA to finalize a rule under CAA Section 202(a) that sets standards for GHG emissions from mobile sources without triggering unprecedented, costly, and burdensome regulatory consequences for stationary sources. [NHTSA-2009-0059-0094.1, p.2]

EPA Must Assess and Address the Motor Vehicle Rule's Impacts on Stationary Sources Before Finalizing the Rule.

EPA's failure to account for the Title V and PSD consequences of finalizing the Motor Vehicle Rule would render the final Rule both arbitrary and capricious, and also invalid based on other procedural requirements for rulemaking. [NHTSA-2009-0059-0094.1, p.2]

1. If finalized, the Motor Vehicle Rule would run afoul of the fundamental prohibition against "arbitrary and capricious" agency action. The Supreme Court has explained that "an agency rule would be arbitrary and capricious if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise." Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co., 463 U.S. 29, 43 (1983) (emphasis added). [NHTSA-2009-0059-0094.1, pp.2-3] [[See Docket Number NHTSA-2009-0059-0094.1, pp.3-4 for more discussion on this issue.]]

2. EPA apparently seeks to justify its failure to consider the PSD and Title V consequences of the proposed Motor Vehicle Rule by directing comments on these consequences to the proposed GHG Tailoring Rule docket. It is improper for EPA to ignore these comments because they relate directly to and flow directly from the proposed Motor Vehicle Rule. [[See Docket Number NHTSA-2009-0059-0094.1, pp.4-6 for a detailed discussion on this issue.]]

Because EPA contends that PSD and Title V requirements for stationary sources will result from this rulemaking, it would arbitrary and capricious for EPA to finalize the Motor Vehicle Rule without considering that consequence. For the reasons stated above, EPA cannot avoid that result by pointing to the GHG Tailoring rulemaking. [NHTSA-2009-0059-0094.1, p.6]

In sum, EPA has no choice but to consider the impacts of the proposed Motor Vehicle Rule in this rulemaking. [NHTSA-2009-0059-0094.1, p.8]

PSD Permitting Requirements Need Not and Should Not Apply to Stationary Sources' GHG Emissions Solely by Virtue of EPA Finalizing the Motor Vehicle Rule

EPA could properly decline to consider the PSD impacts of the proposed Motor Vehicle Rule in this rulemaking docket only if those impacts would not, in fact, result from the Rule. EPA has stated that PSD requirements will be triggered when the proposed Motor Vehicle Rule first subjects GHG emissions from cars to control—that is, model year 2012. See PSD Interpretive Memo Reconsideration, 74 Fed. Reg. at 51545–46. But EPA can interpret the statute and regulations to avoid that result and eliminate the need to analyze the proposed Motor Vehicle Rule's effect on stationary sources in this proceeding. Moreover, by doing so, EPA would eliminate the need for the legally questionable GHG Tailoring Rule. [NHTSA-2009-0059-0094.1, p.8]

The immense burdens associated with PSD permitting that the Agency states would follow from issuance of the proposed Motor Vehicle Rule is not mandated by the Clean Air Act or the PSD regulations but rather is the result of EPA's interpretations of the statute and regulations. EPA's textual analysis, however, skips a crucial step, which is whether the PSD program is actually applicable under the plain language of the statute and regulations to sources that are major only by virtue of GHG emissions or to increases

in GHG emissions when a criteria pollutant is not otherwise experiencing a significant increase. [NHTSA-2009-0059-0094.1, p.8] [[See Docket Number NHTSA-2009-0059-0094.1, pp.8-10 for a detailed discussion on this issue.]]

The Phrase "Pollutants Subject to Regulation" Is Also Most Reasonably Interpreted to Exclude GHGs

If EPA does not interpret the statutory provisions regarding applicability as discussed in II.A, above, EPA should recognize the unique nature of carbon dioxide (CO2) and that Congress did not intend such a pollutant to trigger PSD. The endangerment finding under CAA Title II is distinctly different from the air quality purposes of the PSD program. Specifically, carbon dioxide emissions from motor vehicles are required to be regulated under Title II where, in the Administrator's judgment, such emissions "may reasonably be anticipated to endanger public health or welfare." See 42 U.S.C. 7511(a)(1) (emphasis added). To the extent anthropogenic carbon dioxide emissions may reasonably be viewed as presenting an "endangerment" to "public health or welfare" within the meaning of Title II, it does not follow that EPA is thereby authorized, much less compelled, to regulate CO2 emissions from stationary sources under the CAA's PSD program. [NHTSA-2009-0059-0094.1, p.10] [[See Docket Number NHTSA-2009-0059-0094.1, pp.10-12 for a detailed discussion on this issue.]]

American Farm Bureau Federation (AFBF)

At What Point Will The Economic Impacts on Small Businesses be Described ? [OAR-2009-0472-7171.1, p.3]
As indicated in our comments and the comments of others to the ANPR, the application of these programs will have significant and serious adverse economic impacts on farmers, ranchers, and small businesses as well as schools, hospitals and churches. For example, an endangerment finding automatically subjects stationary sources (buildings, facilities, structures) that have the potential to emit more than 250 tons of GHGs per year to costly and burdensome permits under the PSD program. The PSD permits require the applicant to comply with best available control technology as a condition for obtaining the permit. Title V requires entities that emit, or have the potential to emit, 100 tons per year of a regulated pollutant to also obtain a permit for such emissions. [OAR-2009-0472-7171.1, p.4]

EPA has failed to perform the required economic impact assessment under section 317 of the Clean Air Act. The assessment must be conducted prior to the Tailpipe Rule becoming final. [OAR-2009-0472-7171.1, p.4]

[See Docket Number OAR-2009-0472-7171.1, pp.3-11 for detailed comments pertaining to: The Proposed EPA 'Tailoring rule' does not change the economic implications of regulating GHGs under the Clean Air Act, Title V Permit Requirements Lead to Fees on Livestock, Application of Requirements for Prevention of Significant Deterioration (PSD) Permits Will Cause Adverse Economic Impacts to Agriculture, and Regulation of Greenhouse Gases Under the Clean Air Act Allows Little or No Flexibility]

The de minimis amount of methane emitted from light duty motor vehicles does not sufficiently "cause or contribute" to the endangerment of public health and welfare to warrant regulation under section 202(a) of the Clean Air Act. [OAR-2009-0472-7171.1, p.11]
Seeking to join the six different greenhouse gases together as a single "air pollutant" raises a series of questions and issues. As the agency illustrates, not only must these substances be found to "endanger the public health or welfare" but their emission from the sources sought to be regulated must "cause or contribute" to the air pollution which endangers the public health or welfare. Both of these requirements must be satisfied in order to regulate the substance. [OAR-2009-0472-7171.1, p.12]

[See Docket Number OAR-2009-0472-7171.1, pp.11-14 for detailed comments pertaining to: The de minimis amount of methane emitted from light duty motor vehicles does not sufficiently "cause or contribute" to the endangerment of public health and welfare to warrant regulation under section 202(a) of the Clean Air Act.]

Section 424 of the FY 2010 Interior-Environment Appropriations Act Prohibits the Promulgation of the Tailpipe Rule and the Tailoring Rule during FY 2010. [OAR-2009-0472-7171.1, p.14]
As indicated above, once the Tailpipe Rule has been enacted, a number of Clean Air Act programs and requirements are automatically triggered, including permit requirements under Title V. Title V is a self-executing program such that once a pollutant is regulated under any provision of the Clean Air Act (such as the Tailpipe Rule for GHG), no further rulemaking is required to make covered entities liable to obtain operating permits required by Title V. [OAR-2009-0472-7171.1, p.14]

[See Docket Number OAR-2009-0472-7171.1, pp.14-15 for detailed comments pertaining to: Section 424 of the FY 2010 Interior-Environment Appropriations Act Prohibits the Promulgation of the Tailpipe Rule and the Tailoring Rule during FY 2010]

GHG Regulation May Lead to Promulgation of National Ambient Air Quality Standards
The Clean Air Act and the subsequent judicial interpretations placed upon it, describes the procedure required by the Administrator once she makes an endangerment determination. [OAR-2009-0472-7171.1, p.15]

[See Docket Number OAR-2009-0472-7171.1, pp.14-15 for detailed comments pertaining to: GHG Regulation May Lead to Promulgation of National Ambient Air Quality Standards and the pertinent language in Section 108 of the Clean Air Act]

American Forest and Paper Association (AF&PA)

EPA Must Complete Sufficient Regulatory Impact Analyses Before Promulgating Tailpipe Emission Standards
The preceding discussion showed how using Clean Air Act authorities to impose GHG emission standards on motor vehicles would impose huge burdens on businesses and on regulatory authorities, not only directly, but also because imposition of GHG emission

limits on new motor vehicles would, pursuant to the CAA and EPA regulations, mean that tens of thousands of additional new and modified stationary sources would be subject to pre-construction PSD permitting requirements, as well as requiring Title V operating permits for the first time for millions of sources. In addition to just the cost and delay those sources would incur to apply for such permits, the massive increase in affected sources would overwhelm permitting authorities and result in permitting "gridlock," dramatically slowing economic development and innovation. [OAR-2009-0472-7126.1, p.3]

[See Docket Number OAR-2009-0472-7126.1, pp.3-4 for detailed comments]

EPA Should Defer GHG Emission Standards for Motor Vehicles
For the reasons described above, EPA should not promulgate motor vehicle emissions standards for GHGs at this time. The proposed endangerment and cause-or-contribute findings that are a prerequisite for such standards raised many issues of first impression that have not yet been adequately addressed by EPA. Congress is in the midst of actively considering comprehensive legislation addressing climate change and GHGs, which is much more appropriate than trying to force GHG regulation through Clean Air Act programs that were designed to address entirely different types of air pollution issues. And the imposition of tailpipe emission standards for GHGs will trigger massive stationary source permitting burdens for businesses and regulatory authorities, burdens that EPA has failed to assess and address as required by law. [OAR-2009-0472-7126.1, p.4]

[See Docket Number OAR-2009-0472-7126.1, pp.4-5 for detailed comments]

American Petroleum Institute

However, and even though the direct emissions reductions and fuel economy costs and benefits of the proposed EPA action and the proposed NHTSA fuel economy standards are nearly identical, the proposal entirely ignores the fact that the EPA regulations, if finalized, would have dramatically broader and more costly effects than the NHTSA rule. Unlike NHTSA action to raise corporate average fuel economy (CAFE) standards, new EPA standards promulgated under the Clean Air Act (CAA) would have regulatory impacts reaching far beyond the automotive industry and would trigger EPA regulation of GHG emissions from millions of sources never previously subject to regulation of GHG emissions, including millions of sources not previously subject to any CAA regulation at all.

Thus, while API has only very focused objections to NHTSA increasing CAFE standards in the manner proposed, see Part IV infra, API strongly objects to EPA finalizing its proposed rule under CAA section 202 authority. API urges EPA to assess and address the dramatically adverse impacts of its proposal under CAA section 202 before finalizing its rule. EPA must assess and appropriately minimize these impacts, within this rulemaking if EPA is to promulgate section 202(a) standards that are not flawed as a matter of law.

First, EPA must acknowledge that only pollutants for which a National Ambient Air Quality Standard (NAAQS) has been set trigger Prevention of Significant Deterioration (PSD) permitting requirements.

Second and alternatively, EPA has the full authority and discretion to defer finalizing CAA section 202(a) standards at this time. [OAR-2009-0472-7143.1, p.2]

EPA Cannot Finalize the 202 Rule Before Evaluating and Addressing Its Impacts on Stationary Sources. [OAR-2009-0472-7143.1, p.2]

EPA's Proposed Rule Unlawfully Fails to Analyze Its Effects. [OAR-2009-0472-7143.1, p.3]

EPA May Not Shunt Comments Regarding the Effects of its Proposed Car Rule to the Proposed Tailoring Rule. [OAR-2009-0472-7143.1, p.4]

EPA's View that Issuance of the Proposed Car Rule Automatically Triggers PSD Based Solely on Emissions of GHGs Is Inconsistent with the Plain Meaning of the CAA and EPA's Regulations. [OAR-2009-0472-7143.1, p.5]

EPA Should Exercise its Discretion to Defer Promulgation of a Section 202 Rule: EPA has clear legal authority to defer action on this rule, and should do so because the potential economic consequences of the rule are unprecedented and the environmental benefits of adding its imprimatur to the NHTSA rule are nearly nonexistent.

a. EPA Is Not Compelled to Act at This Time, and Should Exercise Its Discretion to Defer Finalizing New GHG Emissions Standards for Mobile Sources.

b. There Are Numerous Compelling Reasons to Defer the Section 202 Rule

Adding EPA's imprimatur to nearly identical NHTSA fuel economy standards will not achieve any marginal environmental benefit. NHTSA standards without this duplicative reliance on the CAA will not trigger PSD results that EPA has labeled "absurd, "impossible," and "contrary to expressed congressional intent." The fact that the timing of the 202 Rule is discretionary means that EPA's proposed PSD Tailoring Rule cannot be justified under the "absurd results" doctrine, and if the PSD Tailoring Rule is rejected the full range of "absurd" and "impossible" results will then flow from promulgation of the 202 rule. Further considerations also support this conclusion: Ongoing congressional and international deliberations may impact the validity of, or perceived necessity for, the proposed rule. [OAR-2009-0472-7143.1, p.9]

These are only the topic headings, for details please refer to the docket [OAR-2009-0472-7143.1]

Arizona Public Service (APS)

APS has significant concerns regarding the proposed Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards. Specifically, a comparison of the proposed benefits resulting from the EPA program to the NHTSA program reveals the programs to be virtually identical and that EPA's proposal provides no apparent additional benefit. For this reason, APS believes that EPA's action is simply a means to regulate greenhouse gas emissions from stationary sources through the Clean Air Act Prevention of Significant Deterioration (PSD) and Title V permit programs. As such, APS also believes the economic and environmental cost and benefits analysis of this joint proposal fails to assess impacts on stationary sources. [OAR-2009-0472-7107.1, p.1]

If this rule is finalized, a significant number of stationary sources will become subject to PSD and Tide V permitting requirements. However, EPA did not include the economic and environmental consequences of triggering these rules. It is APS' position that EPA either withdraw its portion of the rule or perform a thorough economic and environmental cost and benefit analysis, and provide an adequate public notice and comment period to address the impacts to stationary sources. [OAR-2009-0472-7107.1, p.1]

BCCA Appeal Group (the Group)

More importantly, Congress is moving forward quickly on comprehensive legislation that would address the problem of climate change outside of the structure of the current Act. Despite a clear need to proceed with the utmost caution in this important area, EPA has proposed to regulate GHG emissions from motor vehicles in the Proposed Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards (the "Motor Vehicle GHG Rule"). Under EPA's current interpretation of the CAA, the Motor Vehicle GHG Rule may (as EPA has stated in the Proposed PSD and Title V GHG Tailoring Rule (the "PSD Tailoring Rule")3) trigger regulation of GHG emissions from millions of stationary sources, including hundreds of thousands of Texas sources, many of which have never before been regulated under the Clean Air Act ("CAA"). [OAR-2009-0472-7505.1, pp. 1-2]

The Motor Vehicle GHG Rule, as well as its companion, the PSD Tailoring Rule, are fundamentally flawed, both procedurally and substantively, and Texas, as the nation's leading energy producer and a leader in chemical manufacturing and agriculture, could be significantly impacted by these federal rulemakings. Most notably, EPA completely failed to evaluate the burdens of triggering PSD and Title V for GHG emissions under the required federal regulatory review statutes and Executive Orders. Furthermore, even had the Agency conducted the required burden analysis, the rule is unlawful, would devastate the Texas and national economies, and the burdens of regulating GHGs under CAA Section 202 far outweigh the insignificant environmental benefits of the GHG emission standards. [OAR-2009-0472-7505.1, p. 2]

Accordingly, for all of the reasons discussed in these comments, EPA should withdraw the Motor Vehicle GHG Rule, and proceed with caution going forward by allowing both

the international community and Congress time to develop a comprehensive and sensible approach to the global problem of climate change. [OAR-2009-0472-7505.1, p. 2]

[See OAR-2009-0472-7505.1, pp. 2-11 for comments related to PSD and NRS for stationary sources in Texas. These comments include the following topics: A. The Motor Vehicle GHG Rule Will Disproportionately Harm Texas, B. EPA Utterly Failed to Account for these Devastating Impacts to Texas and the Entire U.S. in its Burden Analysis of the Motor Vehicle GHG Rule, C. A Full Analysis of Actual Impacts on Sectors Beyond Autos Would Demonstrate That the Rule Cannot be Justified—the Burdens Associated with the Motor Vehicle GHG Rule Would Devastate the Texas Economy, D. EPA Should Adopt a More Reasonable Interpretation of the Clean Air Act Under which the Final Motor Vehicle GHG Rule Would Not Trigger PSD For Stationary Sources, and E. Nothing Compels EPA to Action under Section 202 at this Time—the Rule Provides Little or No Benefit and Produces Overwhelming Burdens.]

Brick Industry Association

The Brick Industry Association (BIA) is providing these comments because we are, directly affected by this rulemaking, even though none of our members will be directly subject to the requirements promulgated as a result of this process. As this rulemaking has the potential to impact virtually every manufacturer (and many consumers) in the country by its precedent setting regulation of greenhouse gases, this rulemaking directly impacts all of us. The brick industry provides one of the leading wall cladding materials for both commercial and residential construction throughout the country. There are approximately seventy brick manufacturing companies in the United States, with well over sixty of these companies being considered 'small businesses.' [OAR-2009-0472-11279, p.1]

In developing the Light Duty rule, and assessing the impacts on small businesses, the EPA completely ignored the tens of thousands of facilities that would be impacted by the fact that greenhouse gases would become a regulated pollutant at some point after this rule goes into effect (we are aware that EPA is still evaluating which specific 'triggering action' will make this happen). By deliberately ignoring the broader impact of this rulemaking process, the EPA was able to certify that there was not a significant impact on a substantial number of small entities 'pursuant to the Regulatory Flexibility Act (5 U .S.C. 601 et seq., as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996).' The EPA is disingenuous at best. [OAR-2009-0472-11279, p.1]

Clearly, publishing the 'GHG Tailoring Rule' for the New Source Review Program under Part 50 of the Clean Air Act (published October 27, 2009, 74FR55291) represents significant effort on the EPA's part to mitigate the known impacts of the light Duty rulemaking. That proposal was also certified as having no significant impact on a substantial, number of small entities because it results in a net reduction of burden to industry over the burden that would exist if no 'Tailoring Rule' were promulgated. This clearly demonstrates that EPA understands that an impact occurred, based on their

actions, that impacts industry. We assert that they also should recognize that this impacted industry includes a substantial number of small entities. For our industry, even if the Tailoring Rule is published, the Light Duty Rule means that well over half of our industry will be thrust into the complex, and expensive, New Source Review process for the very first time. Some of our industry will also be pushed back into Title V, even though they will only be major sources for GHG. [OAR-2009-0472-11279, pp.1-2]

The EPA cannot reasonably assert that the Light Duty Rule has no significant impact on a substantial number of small entities in one rule, when less than one month later, it publishes another rule that attempts, but falls short, of mitigating those impacts. [OAR-2009-0472-11279, p.2]

California Cotton Ginners Association (CCGA)

EPA should review the economic benefit of this rule, considering all costs; both of those currently in the docket, and those outlined in the proposed Tailoring Rule. In addition, EPA should clearly evaluate the benefit of regulations solely based on CAFE standards. Finally EPA should consider extending the comment period in this docket, considering the significant additional costs discussed in the Tailoring Rule Proposal. [OAR-2009-0472-7139.1, p.2]

[See Docket Number OAR-2009-0472-7139.1, pp.1-2 for detailed comments]

Charleston Metro Chamber of Commerce

Our Chamber's Environmental Committee has studied the proposed rule and have major concerns primarily relating to the triggering of other provisions of the Clean Air Act (specifically Title V permitting and New Source Review permitting). We do not believe that EPA has adequately evaluated those consequences or options for minimizing and avoiding other collateral impacts. Our interpretation is that this rulemaking will trigger other provisions of the Clean Air Act (specifically Tile V permitting and New Source Review (NSR) permitting). [OAR-2009-0472-7061.1, p.1]

Unlike NHTSA, EPA is under no statutory deadline to promulgate the standards that it is now considering. It has the time and the obligation to analyze more fully its regulatory proposal and the wide-ranging impacts that it anticipates will likely be incurred after its finalization. Finally, EPA has failed even to consider possible ways in which it might avoid prematurely imposing significant regulatory burdens, like PSD and Title V requirements, on stationary sources while pursuing mobile source regulation under section 202(a). These are matters of the utmost significance, and EPA cannot simply ignore them consistent with its obligations under the CAA. For all of the foregoing reasons, Consumers Energy agrees with UARG and requests that EPA withdraw its portion of the Joint Motor Vehicle Proposal, that NHTSA revise its regulations as may be appropriate to address this change, and that EPA engage in a new, more thoroughly reasoned regulatory decision-making process while providing adequate public notice and opportunity for comment on these important issues. [OAR-2009-0472-7264.1, p.2]

Specifically, EPA has failed to carefully evaluate the number of sources that could be affected once the Light-Duty Vehicle GHG Standards go into effect. We feel that EPA has grossly underestimated the number and types of facilities that will be impacted by the light-duty vehicle GHG proposal by becoming subject to NSR pollutants and the Title V and NSR permitting requirements. The South Carolina Department of Health and Environmental Control (SCDHEC) has identified over 800 of the currently permitted small sources that would become subject to Tile V and NSR permitting as soon as GHGs are regulated under Light-duty Vehicle GHG standards. In comparison, South Carolina currently has 281 Title V permitted facilities.

[See Docket Number OAR-2009-0472-7061.1, pp.1-2 for detailed comments]

Consumers Energy

Consumers Energy is a member of the Utility Air Regulatory Group (UARG). We endorse the comments filed by UARG in this docket and incorporate them by reference. While we will not reiterate those detailed legal and technical comments, our comments will highlight several of the issues raised by UARG. [OAR-2009-0472-7264.1, p.1]

1. It is not clear that PSD and Title V permitting requirements would be triggered by the proposed rule.
2. EPA has not established that its proposal is capable of averting any endangerment caused by GHG emissions. Therefore, EPA is not authorized to issue proposed standards under Section 202(a) of the CAA. [OAR-2009-0472-7264.1, p.1]
3. EPA has misinterpreted the legal standard for finding endangerment.
4. EPA's proposed regulations would be largely duplicative of NHTSA's proposed program, adding essentially nothing. The effects of the joint program are too small to attack any climate-related endangerment fruitfully.
5. The environmental and economic impacts analysis underlying the joint motor vehicle proposal suffers from significant weaknesses and must be revised.
6. EPA Has Time To Take These Issues Into Consideration and Is Obligated To Do So. [OAR-2009-0472-7264.1, p.2]

Although the Agency acknowledges the speculative and unquantifiable nature of the matters it has attempted to assess, it fails entirely to address what may be the single most significant issue associated with its proposed standards -- the potential application of the PSD and Title V permitting programs to GHGs emitted by stationary sources. EPA's attempt to address these issues in other rulemakings cannot satisfy its obligations to provide adequate public notice and opportunity for comment on the impacts of the Joint Motor Vehicle Proposal, and indeed, examination of EPA's analysis in the PSD Reconsideration Rule and the Proposed Tailoring Rule demonstrates that issues relevant to this rulemaking will not be analyzed in those proceedings either. [OAR-2009-0472-7264.1, p.2]

Council of Industrial Boiler Owners (CIBO)

Although GHGs are not currently 'subject to regulation' under the CAA, once EPA finalizes the LDV rule to regulate GHG emissions under CAA Section 202, strong legal arguments can be made that other CAA regulatory requirements will be triggered, affecting stationary source CAA compliance. Due to the strong possibility that EPA could be legally compelled to regulate GHG emissions from stationary sources as a result of this regulation, it is unreasonable and arbitrary for EPA not to analyze impacts on stationary sources that could be required to limit their GHG emissions under a reasonable reading of the CAA. EPA has failed to conduct a proper regulatory impact analysis. CIBO takes the position overall that the CAA is an inappropriate vehicle for regulating GHG emissions and any effort to reduce GHG emissions from stationary sources is appropriately left to the federal legislature in the context of comprehensive, nationwide and economy-wide climate legislation. [OAR-2009-0472-7271.3, p.2]

ACCORDING TO EPA'S OWN LEGAL ANALYSIS, GHGS ARE NOT CURRENTLY POLLUTANTS 'SUBJECT TO REGULATION' UNDER THE CAA
As EPA explains in its recently proposed rule reconsidering the December 18, 2008 'PSD Interpretive Memo,' and supported by historic Agency practice and decisions of EPA officials, GHGs are not pollutants that are now 'subject to regulation' under the CAA. EPA [OAR-2009-0472-7271.3, p.2] has long held that for a pollutant to be 'subject to regulation' there must be actual control measures and not only monitoring or reporting requirements. [OAR-2009-0472-7271.3, p.3]

[See docket OAR-2009-0472-7271.3, pp.2-3 for detailed comments pertaining to: According to EPA's Own Legal Analysis, GHGs are not Currently Pollutants 'Subject to Regulation' Under the CAA]

IF GHGs ARE REGULATED UNDER SECTION 202 OF THE CAA, IT IS LIKELY THAT OTHER REGULATORY REQUIREMENTS WILL BE TRIGGERED
In other pending rulemakings, EPA has clearly stated its view that EPA's proposed LDV Rule, if finalized as proposed, will trigger other unrelated CAA regulatory requirements. Specifically, under EPA's interpretation of the CAA, regulation of GHGs under Section 202 will trigger requirements under the Prevention of Significant Deterioration (PSD) program. EPA acknowledged this in its October 27, 2009 proposed rule, Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule; Proposed Rule) (Tailoring Rule). In the opening paragraphs of the Tailoring Rule, EPA notes that once GHGs are regulated [OAR-2009-0472-7271.3, p.3] under Section 202(a), PSD permitting requirements will immediately apply to stationary sources emitting GHGs above the significance threshold. [OAR-2009-0472-7271.3, p.4]

[See docket OAR-2009-0472-7271.3, pp.3-4 for detailed comments pertaining to: If GHGs are Regulated Under Section 202 of the CAA, It is Likely That Other Regulatory Requirements Will Be Triggered]

EPA HAS FAILED TO CONDUCT AN ADEQUATE ANALYSIS OF THE IMPACTS OF THE LDV RULE ON STATIONARY SOURCES.
EPA has failed to conduct a complete analysis of the impacts associated with

regulating GHGs under Section 202(a) of the CAA. EPA has openly acknowledged that the promulgation of standards to control GHG emissions from light-duty motor vehicles under Section 202(a) will inevitably trigger PSD permitting requirements for stationary sources; nonetheless, EPA has not included in this proposal an impact analysis that addresses the effect this rule will have on stationary sources. This represents a major flaw in the proposed rule. [OAR-2009-0472-7271.3, p.4]

[See docket OAR-2009-0472-7271.3, pp.4-10 for detailed comments pertaining to: EPA has Failed to Conduct an Adequate Analysis of the Impacts of the LDV Rule on Stationary Sources]

County of Greenville, SC

Greenville County joins the SC Department of Health and Environmental Control (SCDHEC) in that we do not support EPA moving forward with greenhouse gas standards under the Clean Air Act at this time and request that EPA delay this action until adequate evaluation occurs. EPA has not evaluated the detrimental collateral effect that will occur if these standards are finalized. The additional EPA regulation comes at an enormous cost with virtually no additional environmental benefits from greenhouse gas standards on light-duty vehicles. EPA acknowledges that the only way to reduce carbon dioxide (CO2) emissions from light-duty vehicles is to increase fuel economy and, similarly, that there are no emission control technologies that reduce CO2 emissions from light-duty vehicles. [NHTSA-2009-0059-0101, p.1]

According to DHEC, since the Supreme Court decision, EPA has proposed several actions. First, in February 2009, EPA decided to 'reconsider' the previous administration's decision on whether or not CO2 was a regulated pollutant under Prevention of Significant Deterioration (PSD). Second, in April 2009, EPA proposed a finding that greenhouse gases contribute to air pollution that may endanger public health or welfare. This decision has not been finalized but we understand that the 'endangerment finding' is currently at the Office of Management and Budget for review. Third, in September 2009 EPA and NHTSA proposed this rule to improve fuel economy and regulate greenhouse gases from light-duty vehicles. And finally, EPA has now proposed a 'tailoring rule' to attempt to address the 'absurd results' that will occur in the Title V and PSD permitting programs for New Source Review regulated pollutants once the light-duty vehicle GHG rule is finalized.

EPA Administrator Jackson, before the Senate Committee on Environment and Public Works and in her January 23, 2009, memorandum to all EPA employees, expressed her commitment to uphold the values of transparency and openness in conducting EPA operations. She went on the say in her memo on transparency that, 'The success of our environmental efforts depends on earning and maintaining the trust of the public we serve. The American people will not trust us to protect their health or their environment if they do not trust us to be transparent and inclusive in our decision-making. To earn this trust, we must conduct business with the public openly and fairly.' Greenville County commends EPA Administrator Jackson for her commitment to transparency.

With that being said, the county is concerned that EPA may not be as transparent as they should be and that they are sending mixed or confusing messages about the potential impact of the light-duty vehicle GHG proposal on all sources that could be impacted, in particular small business. EPA actually suggested to affected entities that they should not comment on the light-duty vehicle GHG proposal but should instead submit comments on the proposed 'tailoring rule.' SCDHEC experts believe that EPA was misleading to suggest this point and that it may inappropriately influence small business, industry, and other affected entities to refrain from commenting on an important rulemaking.

It is critical that all potentially affected entities understand the impact of EPA regulating greenhouse gas emissions under the light-duty vehicle proposal. It will be too late to address any concerns that stationary (industrial) sources have in the 'tailoring rule' as they will already be subject to PSD, as defined in the Clean Air Act, once EPA regulates greenhouse gases from light-duty vehicles. There are fundamental issues related to the 'tailoring rule.' and EPA's continued message of the 'absurd results' and 'administrative burden' of not moving forward with a 'tailoring rule' only confuses the real situation as the thresholds being proposed are 'illegal' under the Clean Air Act. Any permit issued with thresholds higher than those within the Clean Air Act would be vulnerable to appeal and litigation, even though EPA attempts to justify the tailoring rule by saying that by not doing so would create results 'so illogical or contrary to sensible policy as to be beyond anything that Congress could reasonably have intended.' We do not understand how EPA could know this and not also know that there is no guarantee their legal interpretation to exempt small sources or set different thresholds in the tailoring rule will not be challenged and upheld in court. EPA moving forward in this direction is very disturbing.

As previously stated, Greenville County has concerns about the collateral effects of EPA moving forward at this time to regulate greenhouse gas emissions from light-duty vehicles. EPA must fully evaluate the collateral impact this proposal would have on all other aspects of the Clean Air Act including, but not limited to, the impact on state and local air permitting authorities, business, industry and the economy to all areas of the country, but in particular states like South Carolina who still employ many people in the manufacturing sector. As they have not fully evaluated the impact to state and local permitting authorities, EPA has not met the requirements under the Unfunded Mandates Reform Act of 2005 for the light-duty vehicle GHG proposal. EPA even states in the tailoring rule for stationary sources, 'State permitting authorities would be paralyzed by permit applications in numbers that are orders of magnitude greater than their current administrative resources could accommodate' yet they have not taken this into consideration in the light-duty vehicle greenhouse gas proposal.

Finalizing this proposal would have a detrimental effect on our state's economy at a time when unemployment is currently at 11.6% and is only expected to increase. Once EPA 'regulates' greenhouse gas emissions from mobile sources, the Clean Air Act requires that stationary sources be regulated under the threshold requirements as specified within the Clean Air Act - regardless of any 'tailoring rule' EPA develops - as those thresholds are specified within federal law. States and local permitting authorities are totally unprepared for the millions of entities which will be required to comply with the Clean Air Act once

greenhouse gas standards are set by EPA on light-duty vehicles. The permitting process with SCDHEC will become so backlogged as to create a permitting moratorium. New business and industry will not be built; existing business will not expand; and, existing business and industry will not repair equipment if such repairs would require a permit. Again, these are detrimental effects in the economy and unintended consequences with the minuscule environmental benefit that would occur from EPA greenhouse gas standards on light-duty vehicles. [NHTSA-2009-0059-0101, pp.2-4]

The commenter has the same concerns as SCDHEC and supports their comments.

Regarding the impact to state and local permitting authorities, one of the areas that EPA has not fully evaluated is that many states, including South Carolina, have state-specific rules that EPA has required be promulgated and approved into the State Implementation Plans that address threshold levels for NSR pollutants. What EPA has also failed to recognize is that regardless of the thresholds they establish in the 'tailoring rule,' business and industry (and possibly other sources) within a SIP approved state are still subject to the state specific regulations - which comply with the federal Clean Air Act. This means that if a state were to move forward with issuing a permit utilizing the federal thresholds that are established under a tailoring rule, the permit would be ripe for appeal and litigation by third parties as the state rule is more stringent. To address this EPA has encouraged states to begin the process as soon as possible to revise these state specific requirements - even knowing that thresholds they are suggesting are illegal because the federal Clean Air Act thresholds are more stringent. We are positive that SCDHEC can not take a regulation to the South Carolina Legislature that violates federal law.

Another area that EPA has failed to carefully evaluate is related to the number of sources that could be affected once the light-duty vehicle GHG proposal goes into effect. The DHEC feels that EPA has grossly underestimated the number and types of facilities that will be impacted by the light-duty vehicle greenhouse gas proposal by becoming subject to NSR pollutants and the Title V and PSD requirements. While SCDHEC continues to evaluate the specific impact to currently permitted SC sources and will make comment to this effect to the 'tailoring rule,' EPA has estimated that 12,000 sources in South Carolina could become major sources; therefore, they would become subject to Title V and PSD permitting as soon as greenhouse gases are regulated under light-duty vehicle greenhouse gas standards. In comparison, South Carolina currently has 281 Title V permitted facilities. In addition to all of the other associated impacts, even the smallest modification or expansion activity may trigger a PSD technology review and modeling analysis. The technology review would encompass all the triggered PSD pollutants, not just greenhouse gases. Economically, these facilities would have no choice but to abandon any new project or modification. It is interesting to note that many of these facilities would be subject to PSD and Title V because of natural gas combustion, which is considered to be a clean burning fuel. In addition, it is expected that new construction would halt because of these new requirements. [OAR-2009-0472-8346, p.4]

Dow Chemical Company (Dow)

EPA should use its discretion and postpone finalizing the proposed rule until all potential impacts are fully considered.
EPA has clear legal authority to defer promulgation of a GHG emission standard under CAA Section 202, even if the Agency proceeds in the near future to finalize a positive endangerment finding under CAA Section 202. EPA should take the time to deliberately and carefully evaluate and consider all potential impacts of the proposed rule before final promulgation, as the agency itself said, "EPA recognizes that some small entities continue to be concerned about the potential impacts of the statutory imposition of PSD requirements that may occur given the various EPA rulemakings currently under consideration concerning greenhouse gas emissions." (74 FR at 49629). Even the Supreme Court in Massachusetts v. EPA, whose ruling is the impetus for this proposal, indicated that EPA has "significant latitude as to the manner, timing, content, and coordination of its regulations with those of other agencies." (Slip op. at 30). [OAR-2009-0472-7221.1, p.2]

EPA should not rush to promulgate this or any rule that has such an enormous impact on regulated entities, both industrial facilities as well as small businesses, and potentially devastating effect on the US [OAR-2009-0472-7221.1, p.2] economy without careful and considerable deliberation and discussion with affected parties. Rather, EPA should exercise its authority to defer promulgation of this proposed rule because the potential economic consequences of the Motor Vehicle Rule are massive and unquestionably outweigh any environmental benefits that would flow from EPA finalizing the rule. Instead, EPA should allow NHTSA to finalize its portion of the rule which proposes CAFÉ standards in order to allow that agency to meet its Model Year 2012 deadline without finalizing EPA's portion of the rule that proposes GHG emissions standards. The NHTSA portion of the rule alone will accomplish both agencies' stated goal of addressing emissions from light duty motor vehicles to significant environmental benefit without unleashing the devastating cascade effects of triggering the PSD program on small and stationary sources under the CAA. Delaying this rulemaking would eliminate the immediate impact of PSD on these sources, or at least allow EPA the time to evaluate other options and to truly recognize the potential impacts of this proposed rule on stationary sources. As a result, there is no need for EPA to finalize this proposed rule at this time. [OAR-2009-0472-7221.1, p.3]

In this proposal, EPA needs to consider potential impacts on stationary sources of GHGs. As a part of this rulemaking, EPA needs to consider and assess the potential impact of this rule on stationary sources. Even though the Proposed Motor Vehicle Rule purports to concern only regulation of mobile source GHG emissions, EPA has stated in other proceedings that the proposed Motor Vehicle Rule's impact is not limited to motor vehicles. In EPA's Advance Notice of Proposed Rulemaking (ANPR) to seek public input on the ramifications of regulating GHGs under the CAA (73 FR 44354), the agency stated that a Motor Vehicle Rule would trigger PSD permitting requirements for GHG emissions from myriad stationary sources throughout the United States that had never before been subject to CAA regulation. Because EPA has made it quite clear that they believe finalizing this rule will automatically impact stationary sources, they are obligated to thoroughly analyze these impacts as part of this rulemaking before final

promulgation. This evaluation should compare the impacts to any benefit the EPA rule provides above and beyond the proposed NHTSA Rule. [OAR-2009-0472-7221.1, p.3]

Duke Energy

Duke Energy Business Services LLC ("Duke Energy"), on behalf of Duke Energy Carolinas, LLC, Duke Energy Indiana, Inc., Duke Energy Ohio, Inc., Duke Energy Kentucky, Inc., and Duke Energy Generation Services ("DEGS"), therefore submits the following comments on the Joint Motor Vehicle Proposal. Specifically, the significant flaws and shortcomings of the Joint Motor Vehicle Proposal necessitate the withdrawal of EPA's portion of the proposed rule. Duke Energy continues to support the enactment of environmentally and economically sustainable federal climate change legislation. Regulating GHGs under the CAA is the wrong approach. [OAR-2009-0472-7136.1, p.2]

The U.S. Environmental Protection Agency's ("EPA") has stated its view that promulgation of the GHG motor vehicle standards will subject GHGs to the CAA Prevention of Significant Deterioration ("PSD") program and the permitting requirements of Title V of the CAA, potentially as soon as the date on which the rule becomes final and effective. Duke Energy believes, however, that EPA's legal positions in this regard and the analysis presented in the proposed rule are seriously flawed and must be corrected. [OAR-2009-0472-7136.1, p.2]

Moreover, because of EPA's stated view that promulgation of the GHG motor vehicle standards will subject GHGs to the PSD program and the permitting requirements of Title V of the CAA, and the fact that EPA's proposed GHG motor vehicle emission standards would be an unnecessary duplication of NHTSA's proposed fuel efficiency requirements, EPA's action is more a proposal to regulate GHG emissions from stationary sources through the PSD and Title V permitting programs than it is a proposal to regulate GHG emissions from motor vehicles. Yet EPA has failed to analyze and address in its proposal what is likely the single most significant issue associated with its proposed standard – the potential application of the PSD and Title V permitting programs to GHGs emitted by stationary sources. This would include an analysis of the significant burdens the rule would place on stationary sources and the impact on jobs and the economy, at a time when unemployment is still rising and the economy is struggling to recover from recession. The EPA has instead suggested that similar issues be addressed through its Proposed Tailoring Rule and PSD Reconsideration Rule. Those proceedings, however, will not adequately evaluate the impact of EPA's proposed joint program with NHTSA; indeed, EPA's selected approach has effectively removed all meaningful opportunities to evaluate and provide comments on the effect of EPA's proposed GHG motor vehicle emission standards on stationary sources. A decision to regulate GHG emissions from stationary sources is of such magnitude that it should be made only based on careful analysis and reasoned determinations of cost, technology, and other relevant factors. It should not result from a back door approach via regulation of automobile fuel efficiency with little more than bare acknowledgement. Given the [OAR-2009-0472-7136.1, p.3] significance of the impacts that are likely to result from the establishment of a CAA-based program to regulate GHG emissions from motor vehicles that, according to EPA,

ultimately result in significant regulation of stationary sources, EPA must analyze these issues adequately as a part of this rulemaking. [OAR-2009-0472-7136.1, p.4]

In addition, because EPA's proposed regulatory program fails to add significantly to the results that could be achieved through NHTSA's proposal alone, EPA should instead consider how it might avoid prematurely triggering PSD and Title V, including through the option of simply addressing carbon dioxide ("CO2") emissions through NHTSA's CAFE standards and not through emission standards promulgated under section 202 of the CAA. EPA is under no statutory or other deadline to promulgate CAA-based regulations of GHGs. It has time and the obligation to consider and analyze fully the various issues raised by this proposed rule, and it should make use of that time. Further, because EPA has additional time to analyze its options, the Agency should examine various mechanisms for regulating under section 202(a) of the CAA that might not result in the imposition of PSD and Title V on countless stationary sources. Duke Energy does not believe that EPA's current proposal would necessarily trigger PSD for GHGs, and the Agency should assess whether it has the ability to avoid needlessly imposing such significant regulatory burdens through a rulemaking that should address only motor vehicles. [OAR-2009-0472-7136.1, p.4]

In summary, for all of foregoing reasons, EPA lacks the legal authority to issue its proposed GHG motor vehicle emission standards under section 202(a) of the CAA. Duke Energy therefore requests that EPA withdraw its portion of the joint Motor Vehicle Proposal and substantially revise its proposal to eliminate the CAA-based portion of the proposed program. Duke Energy further requests that EPA engage in a new and substantially more transparent [OAR-2009-0472-7136.1, p.4] rulemaking process that addresses all of the significant issues that regulation under section 202(a) of the CAA raises, including the ramifications for stationary sources and the economy. At the very least, EPA should reopen the comment period on its proposed GHG motor vehicle emission standards to allow the public to provide comments on these serious matters that EPA has, thus far, neglected. [OAR-2009-0472-7136.1, p.5]

In addition to the above comments, Duke Energy strongly supports the comments submitted by the Utility Air Regulatory Group on the Joint Motor Vehicle Proposal and refers EPA to those comments for a more detail discussion of the issues raised above. [OAR-2009-0472-7136.1, p.5]

Edison Electric Institute

Specific Comments on the Light-Duty Vehicle Proposal
EEI has no comment on the substance or timing of the applicability of the standards to be applied to light-duty motor vehicles. We understand that they can be applied through the NHTSA regulations without recourse to the CAA and fully support the proposal to implement the NHTSA regulations. [OAR-2009-0472-7212.1, p.2]

However, we believe it is important for EPA to consider whether it should promulgate separate rules under the CAA at this time (which would be almost identical as the

NHTSA regulations in their impact on vehicle GHG emissions). Given the interconnected nature of the CAA's provisions for regulating mobile and stationary sources, EPA currently interprets the CAA such that: 1) a final CAA section 202 rule applicable to light-duty motor vehicles would trigger regulated status 2 for the first time for stationary sources emitting GHGs as well; 2) new stationary sources and those existing sources that modify their facilities above specified significance levels would be subject to PSD permitting requirements; and 3) new and existing sources would be obligated to incorporate applicable GHG requirements in title V operating permits. Unfortunately, EPA does not address or even acknowledge these ramifications for stationary sources in the Proposed Rulemaking, nor does the Agency acknowledge the possible CAA remedies to delay such a triggering event. [OAR-2009-0472-7212.1, p.2]

EEI urges EPA to consider whether the Agency should trigger stationary source regulation before it has developed guidance and rules to apply to facilities that would be affected by such regulation. We are concerned that the agency could create a regulatory vacuum were it to proceed without developing needed guidance for regulated entities and their state and federal regulators once GHG regulations apply to stationary sources. While EPA has proposed two rules addressing some aspects of its regulation of GHG emissions from stationary sources, EPA has not proposed any approach to guide the applicability of CAA standards to specific facilities seeking to obtain permits. [OAR-2009-0472-7212.1, p.2]

EPA staff currently are working on a constricted schedule to prepare best available control technology (BACT) guidance under the PSD program, with the assistance of a working group of the Clean Air Act Advisory Committee (CAAAC), for permitting agencies charged with implementing BACT reviews for GHGs. We believe EPA should consider whether the guidance [OAR-2009-0472-7212.1, p.2] being developed will be in place when GHG regulations are applied to stationary sources and consider how the stationary source program could go forward without such guidance. We also request that EPA consider whether additional time for the CAAAC working group and EPA staff to complete such guidance would facilitate a more efficient and orderly transition to regulating GHGs under the PSD program and allow enhanced assessment of the options for incorporating GHG requirements into title V operating permits. [OAR-2009-0472-7212.1, p.3]

Given the substantial impacts of the Proposal on all stationary sources, we request that EPA consider whether administrative necessity requires it to coordinate the timing of this regulation with the issuance of guidance needed to explain how new GHG regulation will apply to permitting of stationary sources. This is the same standard that EPA proposes to apply in the Tailoring rule. Massachusetts v. EPA clearly indicated that the agency has discretion as to the "manner, timing, content, and coordination of its rulemaking with those of other agencies." [OAR-2009-0472-7212.1, p.3]

Importantly, if EPA delays finalizing the CAA section 202 portion of this proposal, NHTSA's estimates of the impacts of the proposed CAFE standards are nearly identical

to EPA's estimates of the impacts of its proposed section 202 motor vehicle emissions standards.[OAR-2009-0472-7212.1, p.3]

Finally, delaying the imposition of regulations on stationary sources would be consistent with the Administration's transition team announcement at the end of last year that Congress would have 18 months to pass comprehensive climate change legislation, obviating the need for piecemeal GHG regulation by EPA via the CAA. Such an 18-month period would continue through approximately July 2010 and provide additional time for Congress to act. Comprehensive legislation, as noted by many Administration officials and by EEI, is far preferable to CAA regulation to reduce GHG emissions. [OAR-2009-0472-7212.1, p.3]

Consequently, EEI asks EPA to consider the timing of the issuance of its proposed light duty motor vehicles rule, in light of the administrative implications such rules would have for stationary sources, to assure that the best regulatory guidance is in place when new GHG related requirements take effect. EEI appreciates the opportunity to provide comments. Questions may be directed to John Kinsman (202-508-5711) or Emily Fisher (202-508-5616). [OAR-2009-0472-7212.1, p.3]

Energy-Intensive Manufacturers Working Group

[[These comments were originally submitted in response to the Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule; Proposed Rule, 74 Fed. Reg. 55292 (October 27, 2009). Because the comments are relevant to related agency proceedings that would culminate in the regulation of greenhouse gas emitters, including the energy-intensive trade-exposed (EITE) members of the Working Group, under the Prevention of Significant Deterioration (PSD) regulatory scheme, the commenter filed them in this docket.]]

[See Docket Number OAR-2009-0472-11276.1, pp.3-42 for all comments on this issue.]

Fertilizer Institute

Best Available Control Technology (BACT)
EPA explains in the preamble to the Prevention of Significant Deterioration (PSD) tailoring rule that the motor vehicle rule will make GHGs a regulated pollutant under the CAA. TFI understands that EPA has formed an advisory committee to evaluate BACT options and that the agency intends to issue guidance on the subject in conjunction with final regulations. However, EPA has failed to comply with its statutory obligations to analyze the cost of potential BACT to impacted industries. Whatever BACT is determined to be, complying with those requirements will pose a significant cost to the industry. [OAR-2009-0472-7279.1, p.2]

TFI requests that an economic analysis of the implementation of BACT will have on industry and more details regarding acceptable BACTs to use for pollution abatement be conducted. [OAR-2009-0472-7279.1, p.2]

Permitting of PSD and Title V Permitting Programs
EPA estimates PSD permit applications would increase by 150-fold and process time for applications could take up to ten years. Additionally, EPA estimates that Title V permit applications will increase and years of delay will result in the program. TFI does not see any near-term benefits to the PSD rule due to the backlog of permits estimated to occur. Furthermore, EPA indicates it will not issue a State Implementation Plan (SIP) call or require states to adjust their PSD rules. The result of this will be uncertainty for applicants and an overwhelmed permitting system with little effective results. [OAR-2009-0472-7279.1, p.2]

TFI requests that EPA evaluate and provide a solution to the expected permitting system conundrum. [OAR-2009-0472-7279.1, p.2]

Economic Impact Analysis (EIA)
EPA, under the CAA, is required to perform an EIA for individual rulemakings under the CAA's authority. Failure to perform this mandatory obligation is a clear violation of the CAA and jeopardizes the credibility and integrity of EPA's ability to make informed policy decisions. [OAR-2009-0472-7279.1, p.2]

TFI requests that EPA perform a full EIA and make these findings available to the public. [OAR-2009-0472-7279.1, p.2]

Georgia Department of Natural Resources

We do, however, have significant concerns with the rule as currently proposed, primarily related to the triggering of other sections of the Clean Air Act (specifically Title V permitting and New Source Review permitting). We do not believe that EPA has adequately evaluated those impacts. We do not believe that EPA has adequately evaluated the options for minimizing, or avoiding, these collateral impacts. Our concerns are described herein along with recommended changes to the proposed rule that will still produce the intended results of the rule, while minimizing, or avoiding, these collateral impacts. [OAR-2009-0472-7150.1, p.1]

EPA should evaluate, as a part of this rulemaking, whether or not other sections of the Clean Air Act (specifically Title V permitting and New Source Review permitting) will be triggered by this rule. And, if these other sections of the Clean Air Act are triggered by this rule, EPA should evaluate, as part of this rulemaking, what the impacts of that triggering are. [OAR-2009-0472-7150.1, p.1]

Our interpretation is that this rulemaking is the action that triggers other sections of the Clean Air Act (specifically Title V permitting and New Source Review permitting). However, in the proposed rule, EPA actually suggested to affected entities that they should not comment on this issue in this rulemaking, but should instead submit comments on the proposed 'Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule' (GHG Tailoring Rule). We believe that EPA was in error to suggest this

point and that it may inappropriately influence agencies and other affected entities to refrain from commenting on an important rulemaking. [OAR-2009-0472-7150.1, pp.1-2]

The EPA GHG Tailoring Rule is a wholly independent rulemaking from the Light-Duty Vehicle GHG Standards rule. The GHG Tailoring rule does not trigger the Title V permitting and New Source Review permitting requirements; the Light-Duty Vehicle GHG Standards rule does. EPA should not rely upon the GHG Tailoring rule to address this issue, particularly in light of the fact that the GHG Tailoring rule may not be in place at the time that EPA finalizes the Light-Duty Vehicle GHG Standards rule. EPA has clearly stated its intent to finalize the Light-Duty Vehicle GHG Standards rule by the end of March 2010. The public comment period on the GHG Tailoring rule ends on December 28, 2009. EPA is expected to get thousands of comments on the GHG Tailoring rule and it would have only three months to address those comments and finalize the rule. This appears to be a monumental task if EPA is going to adequately review all of the comments and make necessary revisions to the proposed rule in response to critical comments received. EPA can not assume, as part of this rulemaking, that the GHG Tailoring rule will be finalized on, or before, the Light-Duty Vehicle GHG Standards rule is finalized. [OAR-2009-0472-7150.1, p.2]

EPA failed to take into account the length of time that it will take for permitting authorities with SIP approved New Source Review (NSR) programs to go through rulemaking (and possibly some state legislatures), hiring, and training in order to implement the mandate of regulating GHG emissions under the Title V and NSR permitting programs. In Georgia, rulemaking will be required in order to insert the new GHG emission thresholds. Rulemaking will also be required in order to increase Title V fees consistent with the Clean Air Act requirement that permitting programs collect enough revenue to implement the program requirements. Given the current state of the economic situation in our state and country, this issue should not be taken lightly. Then, permitting authorities must hire and train staff to issue these complicated permits. This could take up to two years after the requirement is triggered. [OAR-2009-0472-7150.1, p.2]

More fundamentally, the GHG Tailoring Rule appears to be legally vulnerable and may not provide intended relief from the statutory permitting thresholds for PSD and Title V. If the tailoring rule is vacated, the workload for permitting authorities will increase exponentially at a time when State and Local governments are experiencing severe budgetary challenges due to the current economic climate. Vacatur of the GHG Tailoring Rule seems to be a very real possibility if promulgated as proposed. In the Preamble to the proposed rule, EPA provides a lengthy justification for adjusting the statutory permitting thresholds for PSD and Title V, relying on the legal doctrines of 'administrative necessity' and 'absurd results.' However, if the rule is challenged the D.C. Circuit Court of Appeals could hold that these arguments are unpersuasive given the circumstances. The Court could conclude that the proper way to address an excessive burden imposed by statute is to ask Congress to amend the statute. The excessive burden doesn't empower an administrative agency to rewrite the statute. The fact that EPA knowingly promulgated regulations that triggered the concepts of 'administrative

necessity' and 'absurd results,' when equivalent reductions in GHG emissions from vehicles could have been achieved without these collateral impacts, may weaken EPA's legal justification for the Tailoring Rule even further. The sound approach is to prevent the 'administrative necessity' and 'absurd results' by tailoring the GHG and CAFE standards to avoid triggering the permitting requirements, not by attempting to amend administratively the statutory permitting requirements. [OAR-2009-0472-7150.1, pp.2-3]

In short, EPA failed to consider how the rule would affect state/local air permitting authorities. More specifically, EPA failed to comply with the Unfunded Mandates Reform Act of 1995. EPA states in the preamble that this rule only affects manufacturers of cars and light trucks. However, this action has the potential to affect state/local air permitting authorities immensely because it would cause GHG emissions to become regulated under the Title V and New Source Review permitting programs. The proposed rule does not take this into account. The potential impact to state/local air permitting authorities is unprecedented and enormous. In fact, EPA acknowledges in the GHG Tailoring rule preamble that 'State permitting authorities would be paralyzed by permit applications in numbers that are orders of magnitude greater than their current administrative resources could accommodate?' [OAR-2009-0472-7150.1, p.3]

EPA claims that the proposed rule imposes no enforceable duty on any state, local or tribal governments. The basis for this claim is not understood and we believe it to be incorrect. As stated previously, the GHG Tailoring rule acknowledges that state permitting authorities will be 'paralyzed' by the workload created by the triggering of the Title V and NSR permitting provisions for GHG emissions. In the GHG Tailoring rule, EPA purports to reduce this burden by arbitrarily selecting new GHG emission thresholds of 25,000 tons per year CO2 equivalent (or in some cases 10,000 tons per year). Even if the GHG Tailoring rule is finalized as EPA has proposed it, we believe that EPA has significantly underestimated the number of sources that will become subject to the Title V and NSR permitting provisions due to the finalization of the GHG emission standards required by this rule. We will be submitting separate comments to the docket for the GHG Tailoring rule that address this issue. However, the GHG Tailoring rule does not trigger the Title V and NSR permitting provisions for GHG emissions; it only attempts to reduce the burden of that triggering effect. [OAR-2009-0472-7150.1, p.3]

We believe that EPA can accomplish the goals of this rule without triggering other sections of the Clean Air Act (specifically Title V permitting and New Source Review permitting). EPA stated in the preamble that the primary goals of this rule were to achieve substantial reductions of greenhouse gas (GHG) emissions and improvements in fuel economy. [OAR-2009-0472-7150.1, p.4]

EPA, as a policy decision, should not establish GHG emission limits under Section 202(a) of the Clean Air Act at this time. EPA and NHTSA should, instead, establish fuel economy standards that accomplish the desired goals of substantial reductions in GHG emissions and improvements in fuel economy. Therefore, the other sections of the Clean Air Act (specifically Title V permitting and New Source Review permitting) would not be triggered. [OAR-2009-0472-7150.1, p.4]

EPA is under no legal obligation (court decision or Clean Air Act requirement) to finalize GHG emission limits under Section 202(a) of the Clean Air Act at this time. The preamble states that 'EPA has the discretion to take into consideration NHTSA's CAFE standards in determining appropriate action under section 202(a), and we agree. EPA should take into consideration that the new NHTSA CAFE standards accomplish the goals of the rule and EPA should not finalize any GHG emission standards under the authority of the Clean Air Act at this time. [OAR-2009-0472-7150.1, p.4]

Virtually all of the GHG emission reductions required by the proposed rule come from the improvement to NHTSA's CAFE standards. Therefore, the additional EPA regulation comes at an enormous cost with virtually no additional environmental benefits. EPA acknowledges that the only way to reduce CO2 emissions from light-duty vehicles is to increase fuel economy and, similarly, that there are no emission control technologies that reduce CO2 emissions from Light-Duty Vehicles. [OAR-2009-0472-7150.1, p.4]

Georgia-Pacific (GP)

EPA's Failure to Fully Analyze the Burden of the Proposed Section 202 Tailpipe Rule on Stationary Sources Renders the Proposal Unlawful.
Finalization of the Section 202 Tailpipe Rule, assuming EPA also finalizes its endangerment finding, will trigger CAA permitting actions under the PSD and Title V programs. In EPA's proposed Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule ("Tailoring Rule"), the Agency stated that the issuance of the Section 202 Rule will automatically trigger a dramatic increase in PSD (from 300 permits per year to 41,000) and Title V (from 14,000 permits per year to over 6 million) permits for stationary sources each year. Yet, EPA failed to analyze this consequence and burden on stationary sources in its Regulatory Impact Analysis for the Section 202 Tailpipe Rule and to seek public comment on this issue, violating various statutes and Executive Orders. [OAR-2009-0472-7122.1, p.1]

[See Docket Number OAR-2009-0472-7122.1, pp.1-3 for detailed comments pertaining to: EPA Conducted an Insufficient Regulatory Review and Inadequate Public Notice]

EPA Does Not Have to Issue the Section 202 Rule at This Time
In the preamble to the proposed Section 202 Tailpipe Rule, EPA states that the joint rulemaking with the NHTSA corporate average fuel economy (CAFE) standards will enable vehicle manufacturers to build a single national light duty vehicle fleet that satisfies both CAFE and federal and California emissions standards. However, due to the potential enormous implications of the Section 202 Tailpipe Rule on stationary sources (as previously noted), and the fact that EPA has multiple options available for [OAR-2009-0472-7122.1, p.3] regulating GHG from light duty vehicles, EPA should withdraw or postpone its Section 202 Tailpipe Rule. [OAR-2009-0472-7122.1, p.4]

[See Docket Number OAR-2009-0472-7122.1, pp.1-3 for detailed comments pertaining to: EPA's proposed Tailoring Rule provides a reasonable basis for withdrawing or

postponing the proposed Section 202 Rule and EPA has multiple options to issue light-duty vehicle emissions standards under the CAA]

EPA Failed to Seek Comment on the Timing of its Section 202 Rulemaking Action, Violating the Administrative Procedure Act
Notwithstanding the numerous issues upon which EPA sought comment in the proposed rule, EPA did not solicit comment on the key substantive issue that has been identified above – when the Agency should issue a Section 202 Rule. Without notice of this significant issue in the proposed Section 202 Tailpipe Rule, the proposal notice is unlawful under the Administrative Procedure Act and Section 307(d) as described above. See 42 U.S.C. § 7607(d)(3); 5 U.S.C. § 553(b)(3). [OAR-2009-0472-7122.1, p.5]

Industry Coalition

The Associations acknowledge EPA's desire to address GHG emissions from mobile sources quickly, as well as NHTSA's need to set new fuel economy standards, which must be [OAR-2009-0472-7673.1, p.1] promulgated at least 18 months before the affected model year (in this case the 2012 model year). 49 U.S.C. § 32902(g)(2). However, as proposed, the Motor Vehicle Rule ignores the enormous burdens the Rule would impose on stationary sources. This omission violates legal requirements for agency rulemaking, constitutes arbitrary and capricious action, and is simply bad policy. This is especially so because nearly all the environmental benefits EPA says will result from its promulgation of the Motor Vehicle Rule under CAA authority would also result from the NHTSA rule alone. Yet, unlike NHTSA action to raise corporate average fuel economy (CAFE) standards, the redundant EPA standards promulgated under the CAA would have regulatory impacts reaching far beyond the automotive industry and would impose billions of dollars in additional permitting and compliance costs. [OAR-2009-0472-7673.1, p.2]

Thus, although the Associations take no position on NHTSA's proposal to increase CAFE standards, we vigorously object to EPA's proposal to finalize the superfluous Motor Vehicle Rule under CAA Section 202. EPA's failure to account here for the PSD and Title V burdens it elsewhere acknowledges will flow from this rulemaking renders this rulemaking legally invalid. EPA must fully consider those burdens in this rulemaking. [OAR-2009-0472-7673.1, p.2]

EPA Must Assess and Address the Motor Vehicle Rule's Impacts on Stationary Sources Before Finalizing the Rule.
EPA's failure to account for the Title V and PSD consequences of finalizing the Motor Vehicle Rule would render the final Rule both arbitrary and capricious, and also invalid based on other procedural requirements for rulemaking.

[See Docket Number OAR-2009-0472-7673.1, pp.2-8 for detailed comments pertaining to: EPA's Failure to Analyze the PSD and Title V Effects of Finalizing the Motor Vehicle Rule Is Arbitrary and Capricious, EPA's Failure to Analyze the PSD and Title V Effects of Finalizing the Motor Vehicle Rule Runs Contrary to Procedural Requirements

and EPA's Failure to Analyze the PSD and Title V Effects of Finalizing the Motor Vehicle Rule Runs Contrary to Procedural Requirements]

PSD Permitting Requirements Need Not and Should Not Apply to Stationary Sources' GHG Emissions Solely by Virtue of EPA Finalizing the Motor Vehicle Rule
EPA could properly decline to consider the PSD impacts of the proposed Motor Vehicle Rule in this rulemaking docket only if those impacts would not, in fact, result from the Rule. EPA has stated that PSD requirements will be triggered when the proposed Motor Vehicle Rule first subjects GHG emissions from cars to control—that is, model year 2012. See PSD Interpretive Memo Reconsideration, 74 Fed. Reg. at 51545–46. But EPA can interpret the statute and regulations to avoid that result and eliminate the need to analyze the proposed Motor Vehicle Rule's effect on stationary sources in this proceeding. Moreover, by doing so, EPA would eliminate the need for the legally questionable GHG Tailoring Rule.

[See Docket Number OAR-2009-0472-7673.1, pp.8-12 for detailed comments pertaining to: EPA's View that Issuance of the Motor Vehicle Rule Automatically Triggers PSD Based Solely on Emissions of GHGs Is Inconsistent with the Plain Meaning of the CAA and EPA's Regulations and The Phrase "Pollutants Subject to Regulation" Is Also Most Reasonably Interpreted to Exclude GHGs]

EPA Should Exercise its Discretion to Defer Finalizing a Motor Vehicle Rule
EPA has clear legal authority to defer promulgation of an emission standard under CAA Section 202, even if the Agency proceeds in the near future to finalize a positive endangerment finding under CAA Section 202. It would be arbitrary and capricious for EPA not to exercise that authority because the potential economic consequences of the Motor Vehicle Rule are massive, and unquestionably outweigh any environmental benefits that would flow from EPA placing its imprimatur on the NHTSA rule.

[See Docket Number OAR-2009-0472-7673.1, pp.12-14 for detailed comments pertaining to: Nothing Compels EPA to Finalize GHG Emissions Standards for Mobile Sources, EPA Has Not Provided Adequate Reasons for Finalizing GHG Emission Standards for Mobile Sources at This Time, and There Are Numerous Compelling Reasons to Defer the Motor Vehicle Rule]

Mass Comment Campaign (48) (unknown organization)

To make matters worse, these regulations would start a regulatory cascade. EPA would start regulating emissions from millions of sources, including large buildings, churches, sports arenas, office buildings, farms, schools, hospitals' you name it. EPA will be forced to regulate greenhouse gases with many sections of the Clean Air Act, including sections 108, 111, and 112. This will further harm our economy, reduce American jobs, and worsen our employment situation. NHTSA already has the ability to regulate fuel economy without EPA further harming the economy.

Mississippi Department of Environmental Quality

We do, however, have significant concerns with the rule as currently proposed, primarily related to the triggering of other sections of the Clean Air Act (specifically Title V permitting and New Source Review permitting). We do not believe that EPA has adequately evaluated those impacts or has adequately evaluated the options for minimizing, or avoiding, these collateral impacts. In addition, restrictions on GHG emissions from vehicles do not appear necessary to achieve the goal of reducing GHGs; the CAFE standards alone will achieve this goal. Our concerns are described herein along with recommended changes to the proposed rule that will still produce the intended results of the rule, while minimizing, or avoiding, these collateral impacts.

EPA must evaluate, as a part of this rulemaking, whether or not other sections of the Clean Air Act (specifically Title V permitting and New Source Review permitting) will be triggered by this rule. And, if these other sections of the Clean Air Act are triggered by this rule, EPA must evaluate, as part of this rulemaking, what the impacts of that triggering are.

Our interpretation is that this rulemaking is the action that triggers other sections of the Clean Air Act (specifically Title V permitting and New Source Review permitting). However, in the proposed rule, EPA actually suggested to affected entities that they should not comment on this issue in this rulemaking, but should instead submit comments on the proposed 'Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule' (GHG Tailoring Rule).1 We believe that EPA was in error to suggest this point and that it may inappropriately influence agencies to refrain from commenting on an important rulemaking.

The EPA GHG Tailoring Rule is a wholly independent rulemaking from the Light-Duty Vehicle GHG Standards rule. The GHG Tailoring rule does not trigger the Title V permitting and New Source Review permitting requirements; the Light-Duty Vehicle GHG Standards rule does. EPA must not rely upon the GHG Tailoring rule to address this issue, particularly in light of the fact that the GHG Tailoring rule may not be in place at the time that EPA finalizes the Light-Duty Vehicle GHG Standards rule. EPA has clearly stated its intent to finalize the Light-Duty Vehicle GHG Standards rule by the end of March 2010. The public comment period on the GHG Tailoring rule ends on December 28, 2009. EPA is expected to get thousands of comments on the GHG Tailoring rule and it would have only three months to address those comments and finalize the rule. This appears to be a monumental task if EPA is going to adequately review all of the comments and make necessary revisions to the proposed rule in response to critical comments received. EPA cannot assume, as part of this rulemaking, that the GHG Tailoring rule will be finalized on, or before, the Light-Duty Vehicle GHG Standards rule is finalized. [OAR-2009-0472-7102.1, pp.1-5]

The commenter expresses concern about the current state of economy the negative effects of the proposed rule due increase in cost and administrative burden.

National Association of Home Builders (NAHB)

[These comments were originally submitted On December 28, 2009 to the following rulemaking docket: Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 74 Fed. Reg. 55,292 (Oct. 27, 2009), Docket Number EPA-HQ-OAR-2009-0517. Because the NAHB believes that the Tailoring Rule is intertwined with other EPA actions under the Clean Air Act, the NAHB requests that a copy of the NAHB's Tailoring Rule comments also be filed to the EPA-HQ-OAR-2009-0472 docket.]

[See Docket Number EPA-HQ-OAR-2009-0472-11278, pp.4-22 for the comments specific to the PSD and Title V GHG Tailoring Rule.]]

[See Docket Number EPA-HQ-OAR-2009-0472-11278, pp.23-42 for the legal comments on EPA's Tailoring Rule and interrelated agency actions.]

National Association of Manufacturers

On November 18, 2009, the following organizations ('the Associations') jointly requested that the Environmental Protection Agency ('EPA') and the National Highway Traffic Safety Administration ('NHTSA') extend the public comment period for the Motor Vehicle GHG Rule, until December 28, 2009 and that EPA extend the public comment periods for both the GHG Tailoring Rule, and the PSD Interpretive Memo Reconsideration, until January 28, 2010 (collectively, these three rulemakings are referred to herein as the 'GHG rulemakings'): [OAR-2009-0472-11277, p.1]

American Bakers Association, American Chemistry Council, American Iron and Steel Institute, The American Meat Institute, American Petroleum Institute, Chamber of Commerce of the United States of America, Corn Refiners Association, The Institute of Shortening and Edible Oils, National Association of Manufacturers, National Chicken Council, National Council of Farmer Cooperatives, National Grain and Feed Association, National Oilseed Processors Association, National Petrochemical and Refiners Association, The National Renderers Association, Natural Gas Supply Association, Society of Chemical Manufacturers and Affiliates. [OAR-2009-0472-11277, p.2]

On November 25, 2009, EPA Assistant Administrator Gina McCarthy replied by letter to Bryan L. Brendle, Director of Energy and Resources Policy for the National Association of Manufacturers ('NAM'), denying the extension request in its entirety. The Associations hereby request that EPA reconsider its denial of the Associations' original November 18 request for extensions of the GHG rulemakings comment periods for the reasons explained in the request. Alternatively, the Associations request that EPA make comments submitted in each docket part of the docket for all three rules, considering all relevant comments received in the PSD Tailoring Rule docket in both the Motor Vehicle GHG Rule and PSD Interpretive Memo Reconsideration dockets, and vice-versa. A refusal to grant either or both of the Associations' necessary and reasonable requests would be arbitrary and capricious due to both the close timing and interrelatedness of the GHG rulemakings. [OAR-2009-0472-11277, pp.2-3]

The close timing of the GHG rulemakings makes it difficult for the Associations and their members to fully analyze the rules, develop useful data, and submit comments on all relevant aspects of the rules. Problematically, the GHG rulemakings were all published in the Federal Register within just one month of each other. Meanwhile, many sources, including Associations' members, are also focused and have allocated substantial resources towards analyzing and preparing to comply with the final mandatory GHG Reporting Rule for large emitting sources, which was finalized in September 2009. Further compounding the already tight timeline, the GHG rulemaking comment deadlines fall within the holiday season-the Motor Vehicle GHG Rule comments were due during the Thanksgiving holiday and the GHG Tailoring Rule comments are due immediately after Christmas, times when many U.S. businesses and state agencies are closed and/or short staffed. As the Associations explained in the November 18 request, the GHG rulemakings are legally and technically complex, with significant and likely unprecedented consequences for the Associations, their members, and the U.S. economy as a whole. Each rulemaking on its own requires sufficient time and resources to fully evaluate the consequences of the rulemaking, develop data and analyses, and formulate appropriate comments. Given the close timing of the publication of the GHG rulemakings, the current comment periods are simply insufficient to allow the Associations a fair opportunity to do so. [OAR-2009-0472-11277, p.3]

Furthermore, the GHG rulemakings are so interrelated that many comments on the GHG Tailoring Rule are equally applicable to both the PSD Interpretive Memo and the Motor Vehicle GHG Rule, and vice-versa. This is particularly important with regards to the Motor Vehicle GHG Rule's impacts on stationary sources. At the time of publication, Association members as well as many other U.S. businesses, states, and consumers, were not on notice of the Rule's severe consequences for stationary sources. The Motor Vehicle GHG Rule does not even mention, let alone fully address, the impacts on stationary sources; rather, it disingenuously presents itself as a rulemaking solely affecting light-duty motor vehicles. Not until October 27, 2009, just 30 days prior to the Motor Vehicle GHG Rule comment deadline, did the GHG Tailoring Rule's publication in the Federal Register put the American public and the regulated community officially on notice that the CAA Section 202 regulations to control GHG emission from motor vehicles would 'trigger PSD and title V applicability requirements for GHG emissions.' And EPA has still not conducted a full Regulatory Impact Analysis assessing the combined results of the three interrelated rulemakings. [OAR-2009-0472-11277, p.3]

Comments submitted in the Motor Vehicle GHG Rule docket reflect the inadequacy of public notice regarding the Rule's impacts on sources other than motor vehicles. As the South Carolina Department of Health and Environmental Control explained in comments on the Motor Vehicle GHG Rule:

We are concerned that EPA may not be as transparent as they should be and that they are sending mixed or confusing messages about the potential impact of the light-duty vehicle GHG proposal on all sources that could be impacted, in particular small business. EPA actually suggested to affected entities that they should not comment on the light-duty vehicle GHG proposal but should instead submit comments on the proposed 'tailoring

rule.' We believe that EPA was misleading to suggest this and that it may inappropriately influence small business, industry, and other affected entities to refrain from commenting on an important rulemaking. [OAR-2009-0472-11277, pp.3-4]

The absence of comments on the Motor Vehicle GHG Rule's impact on stationary sources in many submissions, reflects the accuracy of South Carolina's prediction. Many organizations have heeded EPA's direction to submit comments on PSD and Title V permitting requirements in the GHG Tailoring Rule docket only, and may have missed EPA's subsequent suggestion that the Motor Vehicle GHG Rule, and not the GHG Tailoring Rule, imposes these requirements. [OAR-2009-0472-11277, p.4]

To ensure an adequate and complete record for the GHG rulemakings, to give commenters a fair and full opportunity to analyze the proposals individually and collectively, and given the close timing and interrelatedness of the rulemakings, the Associations respectfully request that either: (1) EPA and NHTSA extend the public comment deadline for the Motor Vehicle GHG Rule until December 28, 2009, and that EPA extend the public comment deadlines for both the GHG Tailoring Rule and the PSD Interpretive Memo Reconsideration until January 28, 2010; or alternatively (2) that EPA consider comments submitted in the GHG Tailoring Rule to be submitted in both the PSD Interpretive Memo Reconsideration and Motor Vehicle GHG Rule dockets, and vice-versa. The Associations believe that a failure to grant this reasonable request would be arbitrary and capricious. [OAR-2009-0472-11277, p.4]

The NAM supports the Administration's goal to harmonize fuel efficiency standards by implementing a federal rule that will pre-empt disparate state and regional programs. However, manufacturers believe that the process established by EPA, by using the Clean Air Act as its primary statutory vehicle, is deeply flawed and will have the unintended and unmanageable consequence of triggering regulation of millions of stationary sources. By resorting to the CAA, the EPA has established a process that will undermine private and public efforts to recover from the deepest economic downturn since the 1930s. Alternatively, the EPA should promulgate a rule that adequately decouples the goal of achieving greater fuel efficiency and reduced light-duty vehicle GHG emissions from the consequence of regulating GHG emissions from millions of stationary facilities. Any failure to do so will inflict harm on the manufacturing sector for which the NAM must seek appropriate remedies, legislative or otherwise. [OAR-2009-0472-7215.1, p.5]

National Climate Coalition

Stabilizing atmospheric greenhouse gas concentrations will require the transformation of our energy, manufacturing and transportation systems. We believe that this is the work of Congress. Federal legislation should not only take a broad, flexible multi-sector approach, but also must be designed to meet multiple objectives, including energy and transportation security, reliability and affordability; ensuring the economic competitiveness of United States businesses; energy conservation; strategic technology development; and environmental performance. Such legislation should also allow for and define the appropriate involvement of other departments and agencies with expertise in

energy, environment, security and transportation in addition to EPA – something that is necessary yet not permitted under the Clean Air Act. Our highest priority must be for Congress to establish a uniform national program that will be consistent with the emerging and overarching international framework. [NHTSA-2009-0059-0086.1, p.4]

For a variety of reasons, the existing Clean Air Act is a poor mechanism for addressing climate change. Congressional intent in drafting the Clean Air Act was to identify and regulate sources based on their relatively large emissions. Such sources typically have also been financially able to bear the costs of regulation. By establishing major source thresholds, the Act excluded from regulation the large numbers of smaller sources that exist in the United States. The number of stationary sources subject to regulation has thus historically been relatively small. By all estimates, however, this number could grow by at least an order of magnitude, perhaps two, and affect for the first time many previously unaffected sources (e.g., large retail establishments, schools, hospitals and government facilities) if greenhouse gases are regulated in the same manner as criteria pollutants under NSR, and Title V — let alone §112, which has even lower thresholds for regulation. [NHTSA-2009-0059-0086.1, pp.4-5]

The permitting thresholds under the Act, however, are keyed to emissions levels that are meaningful only in the context of regulating the local and regional health and welfare impacts of lower-emitting criteria or hazardous air pollutants. Even small sources have emissions of CO2 as a result of typical fuel use that would exceed current permitting thresholds on this basis. As EPA itself underscored in the ANPR and the Tailoring Rule Proposal, the PSD and Title V programs would sweep hundreds of thousands of sources not previously subject to regulation into the scope of the Clean Air Act, at great cost and consequence for the functioning of the economy and at great administrative burden on regulated sources, EPA, the states and local governments. EPA estimates that its approach in the Tailoring Rule would avoid over $55.6 billion in the first six years of regulation – or, stated differently, in the absence of the Tailoring Rule, the cost of compliance for affected sources and permitting agencies will increase by more than $55.6 billion. [NHTSA-2009-0059-0086.1, p.5]

Paradoxically, forcing the square peg of greenhouse gas emissions into the round hole of the existing Clean Air Act also has the potential to create adverse incentives that may stifle innovation and even increase greenhouse gas emissions. This could occur, for instance, if a company decides to delay improvements that would otherwise reduce emissions intensity to avoid triggering regulatory requirements, as we have seen occur time and time again under the New Source Review programs. A practical example of this situation is a turbine upgrade at an electric generating station. While the project results in more efficient production of electricity, if that energy efficiency were projected to result in more criteria pollutant emissions on an annual basis due to increased operations, it is likely the project would not be pursued due to the time consuming and expensive requirements of the New Source Review programs, including the likely need to implement additional controls for all pollutants that exceed the NSR pollutant thresholds. That is contrary to the desired outcome. [NHTSA-2009-0059-0086.1, p.5]

Regulation under the Clean Air Act has historically focused on control of criteria and hazardous air pollutants to address the local or regional human health, welfare and environmental impacts. The architecture of the Clean Air Act is thus premised on the concept that state, regional and federal control of emissions will improve air quality in the corresponding area. This is not accurate as to greenhouse gases. The greenhouse effect is global -- and localized (or even United States-wide) emissions reductions will not result in environmental benefits to the United States in the absence of corresponding international action. Moreover, greenhouse gases at current and projected atmospheric concentrations have no known direct adverse human health impacts to which to link standards, and any environmental and welfare impacts only occur over substantial time, due to the indirect effects of aggregate global levels of greenhouse gases. Thus, greenhouse gases present a particular regulatory challenge. The same requirements that apply to emissions of criteria pollutants from stationary sources are not likely optimally to control and provide the most effective incentives to reduce greenhouse gases emissions. [NHTSA-2009-0059-0086.1, p.5]

Because the Clean Air Act is such a poor vehicle for addressing climate change, we believe that further federal legislation is the best approach to reduce emissions that may contribute to global warming. We recognize that the Supreme Court's decision in Massachusetts v. EPA may require the Agency to commence regulatory action in absence of, or in the face of delayed, Congressional action. Congress, however, is poised to act. Comprehensive climate change and energy legislation has been passed by the U.S. House of Representatives, H.R. 2454 - the American Clean Energy and Security Act of 2009 (Waxman-Markey), and the Senate is considering stand alone climate change legislation, the "Clean Energy Jobs and American Power Act" (Kerry-Boxer), and energy legislation, S. 1462 - the American Clean Energy Leadership Act of 2009 (ACELA). The NCC urges EPA and the Administration to work in support of prompt Congressional efforts, and exercise its authority only where it can adopt flexible, appropriate measures to control greenhouse gases in a manner best designed to facilitate ultimate Congressional action. [NHTSA-2009-0059-0086.1, pp.5-6]

Absent Congressional Action, Should EPA Decide To Regulate Mobile and Stationary Sources Under The Clean Air Act, It Must Select Appropriate Trigger Dates On Which Regulatory Requirements Would Apply to Stationary Sources

EPA proposed three interrelated actions with respect to greenhouse gases emissions within weeks of each other: the Light Duty Vehicle Rule, the Interpretive Rule, and the Tailoring Rule. In the Interpretive Rule proposal, EPA supports the position that a greenhouse gas becomes a "regulated pollutant" once it is "subject to regulation" in the form of an "actual control" under a final and "effective" Clean Air Act national regulation. See PSD Interpretive Rule, 74 F.R. 51538-41, 51545-46. EPA proposes that the Light Duty Vehicle Rule, which it intends to finalize by March 30, 2010, would present the first such rule applicable to any greenhouse gas emissions. See PSD Interpretive Rule, 74 F.R. 51547. Unless Congress enacts preemptive legislation, the combined effect of EPA's positions in the PSD Interpretive Rule, the Light Duty Vehicle Rule and the Tailoring Rule (which would phase-in and tailor application of PSD and

Title V to stationary sources) would be to subject stationary sources to PSD and Title V requirements on the "effective date" of the Light Duty Vehicle Rule – as soon as 60 days after publication of the final Light Duty Vehicle Rule in the Federal Register (approximately June 2010). See PSD Interpretive Rule, 74 F.R. 51545-46; Tailoring Rule, 74 F.R. 55294, 55299- 55300.

The NCC intends to submit comments on the Interpretive Rule supporting EPA's initial and currently-supported interpretation that the date on which a pollutant becomes subject to an "actual control" under a final national rule is a better measure of the date at which a pollutant becomes "subject to regulation" than the other options discussed by EPA in the Interpretive Rule. However, we also intend to indicate that we believe EPA's preferred choice of the "effective date" of such a rule, while a better choice than promulgation date, still does not properly mark the date on which a pollutant is actually controlled. Instead, it is the "first substantive compliance date" of that national rule establishing emission standards for greenhouse gases that is the date on which those greenhouse gases will be actually controlled and, thus, subject to regulation. [NHTSA-2009-0059-0086.1, pp.6-7]

Assuming for purposes of these comments that EPA will implement the "effective date" approach in the Interpretive Rule rather than the "first substantive compliance date" approach advocated by the NCC, we request that EPA use the fullest extent of its discretion to set the effective date for the Light Duty Vehicle Rule as one that gives EPA, affected sources and permitting authorities the greatest lead time for implementation of the PSD and Title V programs' applicability to greenhouse gases. In particular, we request that the effective date for the Light Duty Vehicle Rule be set no sooner than January 2, 2011 – the first date on which a 2012 model year vehicle can be produced. See Light Duty Vehicle Rule, 74 F.R. 49454; 40 CFR 85.2302-2304. [NHTSA-2009-0059-0086.1, p.7]

EPA has substantial discretion in setting the effective date of the Light Duty Vehicle Rule. While the effective date can be no sooner than 60 days after promulgation, there is no definite limit on how long after promulgation a rule must be effective. As noted by the Supreme Court in Massachusetts v. EPA," EPA [] has significant latitude as to the manner, timing, content, and coordination of its regulations with those of other agencies." Slip Op. at 30. Additionally, as documented at length by EPA in the Tailoring Rule, the long-held judicial doctrines of absurd results and administrative necessity support even agency action that would deviate from statutory language, if such action is necessary to avoid results contrary to Congressional intent or due to administrative necessity. See Tailoring Rule, 74 F.R. 55311- 55320. [NHTSA-2009-0059-0086.1, p.7]

While the "effective date" the NCC promotes for the Light Duty Vehicle Rule would differ by only six months from that which would result from applying the minimum time between promulgation and effectiveness required by the Congressional Review Act, there are legal and policy factors that make these six months crucial for affected stationary sources and permitting authorities as they scramble to comply with PSD and Title V requirements as applied to greenhouse gases. The importance of affording EPA, affected sources and permitting authorities the necessary lead time to study and evaluate the

emissions characteristics and control options for new pollutants prior to making emissions of those pollutants subject to PSD and Title V permitting requirements cannot be overstated. This is particularly true for sources that would be newly subject to Title V because of their potential to emit GHGs, and would therefore need to apply for Title V permits or synthetic minor permits (and their permitting authorities that would need to timely issue these permits). Furthermore, if phase-in approaches such as the Tailoring Rule are to provide true legal relief for potentially affected sources, the states which implement PSD and/or Title V under their own regulations will need this additional time - and perhaps more - to promulgate their own tailoring rules. [NHTSA-2009-0059-0086.1, p.7]

Thus, EPA should use the fullest extent of its discretion to set the effective date of the Light Duty Vehicle Rule's emission standards for greenhouse gases in the manner that provides the greatest lead time for EPA, affected sources and permitting authorities to comply with the PSD and Title V requirements that will be triggered by the Light Duty Vehicle Rule. In particular, the "effective date" of the Light Duty Vehicle Rule should be set no sooner than January 2, 2011, the first date on which any model year 2012 vehicle could be produced which would have to comply with the greenhouse gas emissions standards in that rule. [NHTSA-2009-0059-0086.1, pp.7-8]

The National Climate Coalition appreciates the opportunity to submit these comments and looks forward to providing further input. We encourage EPA to work with Congress towards prompt national greenhouse gas legislation. If EPA must continue to move ahead with rulemakings under the Clean Air Act, then we urge the Agency to exercise its discretion to limit application of those sections of the statute that would impose unintended economic harm and divert scarce public and private resources without commensurate benefit in stabilizing global greenhouse gas concentrations. As appropriate, in the course of regulating greenhouse gases under the statute, EPA also should seek prompt Congressional confirmation that such harmful provisions may be so limited or need not be implemented to address climate change. [NHTSA-2009-0059-0086.1, p.8]

National Cotton Ginners Association

Neither the NCGA nor other gin associations had intended to comment on this proposal since our primary concern is the effect of Greenhouse Gas (GHG) regulations on stationary sources. For this reason, we had not exhausted much effort evaluating this docket until the proposed Greenhouse Gas Tailoring Rule was proposed on October 27, 2009 (74 FR 55292). The proposed Tailoring Rule is based on the assumption that the act of regulating GHG emissions from automobiles under the Clean Air Act will trigger regulatory requirements that affect stationary sources (i.e., PSD/NSR and Title V programs) of GHG emissions. In supporting documents for the Tailoring Rule, EPA estimates that without this rule, over 6 million stationary sources will become subject to Title V, permitting requirements at a cost of over $38 billion. EPA is using the Tailoring Rule to adjust the stationary thresholds to a more manageable level, relying on "absurd

results" and "administrative necessity" doctrines as legal justifications for modifying statutory thresholds.

If the analysis of the Tailoring Rule is correct, then the additional cost burden for stationary sources should be reflected in the economic analysis for the Light Duty Vehicle GHG Rule. The impact of this rulemaking on stationary sources was not considered. Proper consideration of the complete cost picture is very important in this docket. This is especially true, considering that EPA would gain almost all of their GHG reductions from Light Duty Vehicles through the NHTSA CAFE standards. If EPA used the CAFE standards to calculate GHG reductions, the GHG reductions would remain very comparable, and the unnecessary regulatory burden on stationary sources could be avoided.

It appears that the origin of the "absurd results" and "administrative necessity" lies in this very docket, and the solution to the "absurd results" and "administrative necessity" is achievable through the CAFE standards without significant loss of GHG reduction benefits.

NCGA strongly requests that EPA review the full economic impact of this rule, considering all costs: both those currently in the Light Duty Vehicle proposed rule and those outlined in the proposed Tailoring Rule before promulgating any rule for Light Duty Vehicles. In addition, EPA should clearly evaluate the benefits of regulations solely based on CAFE standards. Finally, EPA should consider extending the comment period in this docket, considering the significant additional costs that are discussed in the Tailoring Rule proposal. [OAR-2009-0472-7209.1, pp.1-2]

National Mining Association (NMA)

NMA believes that the economic and regulatory implications a final motor vehicle rule will have for all sources of GHG emissions economy-wide will be extraordinarily significant. EPA has neglected, however, to conduct required statutory analyses of these impacts. EPA implies in this rule and explains in its proposed PSD tailoring rule that it understands the regulatory consequences under the CAA that will result when the motor vehicle rule is finalized. The agency has not, however, taken the necessary steps to avoid these consequences, nor to avoid the legal ramifications that may jeopardize the rule. [OAR-2009-0472-7237.1, p.2]

A final light-duty motor vehicle rule will trigger regulatory requirements under the PSD program of the CAA that will result in significant economic and regulatory consequences. [OAR-2009-0472-7237.1, p.2]

[See Docket Number OAR-2009-0472-7237.1, pp.1-2 for detailed comments]

NMA understands that EPA has formed an advisory committee to examine BACT options and that the agency intends to issue guidance on the subject in conjunction with final regulations. EPA has failed, however, to comply with its statutory obligations to

analyze the cost of potential BACT to impacted industries. Whatever BACT is determined to be, complying with those requirements will pose significant cost to industry. If EPA has already gathered information on the type of BACT controls that may be required for industrial source categories, it has not made that information available as part of this rulemaking docket. [OAR-2009-0472-7237.1, p.3]

[See Docket Number OAR-2009-0472-7237.1, pp.2-3 for detailed comments]

Until State PSD programs are revised, the severe permitting consequences of a final motor vehicle rule that the proposed PSD tailoring rule is designed to avoid will come to fruition. [OAR-2009-0472-7237.1, p.3]

Even if the PSD tailoring rule is finalized, and is successful accomplishing what EPA expects it to, all of the consequences described in the tailoring proposal will still occur, at least in the near term. In order for the "beneficial impacts" of the PSD tailoring rule [OAR-2009-0472-7237.1, p.3] to come to fruition, most states would first need to adjust their individual PSD programs accordingly. Although EPA approves state programs under the State Implementation Plan (SIP) process, each state program would remain legal and enforceable under state law until changed. [OAR-2009-0472-7237.1, p.4]

[See Docket Number OAR-2009-0472-7237.1, pp.3-4 for detailed comments]

EPA has failed in its statutory obligations to analyze the impacts of its proposed GHG regulations on the public.
EPA is required by relevant Executive Orders and statutes to produce studies necessary to fully analyze the large economic and regulatory consequences that the motor vehicle rule will have on major stationary sources. As has been previously stated, EPA has conducted an RIA with respect to the motor vehicle rule, but those analyses are limited to the direct benefits and effects of GHG regulation of motor vehicles, and do not address the PSD effects on major stationary sources triggered thereby. [OAR-2009-0472-7237.1, p.4]

[See Docket Number OAR-2009-0472-7237.1, pp.4-7 for detailed comments pertaining to: Regulatory Flexibility Act, CAA § 317, and Unfunded Mandates Reform Act]

EPA is not obligated to finalize the motor vehicle rule in the time frame it has identified NHTSA is under a statutory obligation to promulgate CAFE standards by March 30, 2010. EPA has identified this same date as the date it must finalize the motor vehicle rule. EPA, however, is under no statutory obligation to promulgate this rule, nor a deadline to finalize its portion of the Joint Motor Vehicle Proposal.

EPA has failed in its obligation under various Executive Orders and statutes to review the economic and regulatory impacts on major stationary sources and the economy as a whole that will result when the proposed motor vehicle rule is finalized and becomes effective. EPA's attempts to address these issues in other rulemakings are also precarious, and at the very least insufficient to satisfy the identified statutory mandates. Unlike NHTSA, EPA is not under deadline to promulgate the proposed standards. EPA has the

authority and obligation to fully analyze the broad-ranging and significant impacts that the agency itself recognizes will occur after this proposal is finalized, and to make that analysis available to the public. [OAR-2009-0472-7237.1, p.8]

For these reasons, NMA urges EPA to withdraw the motor vehicle rule and undertake a new, public process aimed at sufficiently analyzing all of the impacts that will result from such action. NMA appreciates this opportunity to submit these comments. [OAR-2009-0472-7237.1, p.8]

[See Docket Number OAR-2009-0472-7237.1, pp.7-8 for detailed comments]

National Petrochemical & Refiners Association

EPA's Section 202 Rule Should Be Withdrawn or Reproposed Since It Violates Several Statutes and Executive Orders.
In the proposed rulemaking, EPA has completely failed to take into account the enormous economic and regulatory consequences of this rulemaking on stationary sources. Even though the Agency's current interpretation of the CAA considers a final section 202 rule to constitute a "triggering" event that would require CAA permitting actions either at the time of promulgation of the rule or upon the effective date of the rule, the proposed rule and its associated "Regulatory [OAR-2009-0472-7234.1, p.3] Impact Analysis" ("RIA") thoroughly ignore this consequence, a consequence that the Agency considers to be legally inevitable. Specifically, this proposed rule: [OAR-2009-0472-7234.1, p.4]

[See Docket Number OAR-2009-0472-7234.1, pp.3-5 for detailed comments pertaining to: Violates the Paperwork Reduction Act, Violates the Regulatory Flexibility Act, Violates Executive Order 12866, Violates the Unfunded Mandates Reform Act, Violates Executive Orders 13132 and 13175, and Violates Executive Order 13211]

EPA Is Not Required Either to Propose or Finalize the Section 202 Rulemaking At This Time.
There is no statutory schedule or judicial order applicable to this rulemaking.
EPA is proposing to regulate GHG emissions from individual manufacturer fleets sold in each model year. EPA relies on CAA section 202(a) to establish an attribute-based approach for a CO2 fleet-wide standard based on the footprint of the vehicle. EPA separately relies on section 202(a) to propose per-vehicle standards for nitrous oxide and methane emissions. In addition, EPA cites several other sections of Title II of the CAA that are relevant to the standards, including provisions affecting Agency discretion with regard to useful life, certificates of conformity, testing requirements, and warranties. [OAR-2009-0472-7234.1, p.6]

[See Docket Number OAR-2009-0472-7234.1, pp.6-10 for detailed comments pertaining to: There is no statutory schedule or judicial order applicable to this rulemaking, There would not be a significant public health or environmental impact if EPA withdraws the proposed section 202 standards or delays finalization of such standards, EPA proposes to

regulate only three GHGs, and If EPA were to withdraw or delay finalization of the proposal rules, regulatory delay and uncertainty would not result]

EPA May Avoid "Impossible" Results By Redefining PSD Applicability
As indicated above, EPA is not compelled to finalize the Section 202 rulemaking at this time, but has significant discretion as to the manner, timing and content of any action that it takes to respond to Massachusetts v. EPA. In addition, however, EPA can avoid "impossible burdens" the Agency identified in the Tailoring Rule (e.g., the near-immediate expansion of state and local permitting programs to include assessments of GHG emissions) and at the same time properly confine the effects of this rulemaking to light duty vehicle manufacturers. As detailed below, the Agency should redefine PSD applicability to follow the clear language and structure of the CAA. By doing so, EPA could proceed to finalize the section 202 rulemaking while not imposing "impossible burdens" it has projected will result from this rulemaking. EPA could also avoid unnecessary and unsupported reliance on administrative law doctrines in the Tailoring Rule and comply with the CAA in the manner in which it is plainly written [OAR-2009-0472-7234.1, p.10]

[See Docket Number OAR-2009-0472-7234.1, pp.10-12 for detailed comments pertaining to: EPA May Avoid 'Impossible' Results By Redefining PSD Applicability]

EPA Should Withdraw Its Proposed Section 202 Rules or Delay Finalization of the Rules In Order to Avoid "Impossible" Burdens That Could Result from Other CAA Provisions. EPA's Legal Theories For Reducing the Burdens of the PSD and Title V programs in the Proposed Tailoring Rule Do Not Relieve the Agency of the Requirement to Analyze the Burdens That the Section 202 Rule Imposes.
Under EPA's current interpretation of the CAA and associated regulations, PSD, and Title V permitting requirements will apply to new, modified and operating sources of GHGs as of 60 [OAR-2009-0472-7234.1, p.15] days following the Federal Register publication of this rulemaking. Since EPA expects to finalize the light duty vehicle rulemaking by the end of March 2010, this would mean that EPA would seek to apply permitting requirements to new sources and sources undergoing a major modification which increased emissions by late May/June of 2010 and require various state and local permitting agencies to also apply these requirements. Under EPA's current interpretation of the relevant law and regulations, existing sources could be required to apply for Title V operating permits covering GHG emissions one year later. [OAR-2009-0472-7234.1, p.16]

[See Docket Number OAR-2009-0472-7234.1, pp.15-18 for detailed comments pertaining to: EPA has the ability to avoid 'impossible' results of this rulemaking and EPA must take time and effort to analyze the full burden of this rulemaking]

The Rulemaking Process Is Unprecedented and Designed to Reach a Predetermined Result and Therefore Violates the Requirements of the Clean Air Act and the Administrative Procedure Act
The "joint rulemaking" between EPA and NHTSA is unprecedented and calls into serious

question how each Agency exerted independent judgment in fulfilling their separate statutory responsibilities under the CAA and EPCA. Moreover, the history of this rulemaking indicates that EPA and other Administration officials engaged in a series of meetings which predated this proposal and predetermined the end result of the rulemaking process either directly or through impermissible incentives to promulgate a final rule within certain parameters. Therefore, the rulemaking violates sections 202(a) and 307(d) of the CAA and requirements of the Administrative Procedure Act. Since the issues involve the timing, stringency and final form of the promulgated standards, they are of central relevance to the rule. [OAR-2009-0472-7234.1, p.18]

[See Docket Number OAR-2009-0472-7234.1, pp.18-21 for detailed comments pertaining to: This 'joint rulemaking' is unprecedented and prevents EPA from exercising independent judgment, Agreements between the Administration, EPA, the Department of Transportation ('DOT'), the State of California and auto manufacturers have predetermined the content and overall result of this rulemaking, EPA's consideration and approval of the California waiver request under section 209 of the CAA improperly influenced the Agency's actions in this rulemaking]

The Proposed Rule Violates the Administrative Procedure Act since EPA Did Not Seek Comment on When the Agency Should Act, By Virtue of this Rulemaking, to Make GHGs "Regulated Air Pollutants" Under the Clean Air Act
In its proposed endangerment determination, EPA took comment on the question of whether the Agency should regulate GHGs individually, or as a group. EPA has otherwise indicated that finalization of the endangerment determination itself will not make any GHG a "regulated air pollutant" under the CAA. Therefore, if EPA considers this rulemaking to have the effect of making several GHGs "regulated air pollutants," the Agency must take comment on the question of when the Agency should take action to affect the regulatory status of various GHGs by making them a "regulated air pollutants" subject to "actual control" under the Clean Air Act. As demonstrated in this rulemaking and in the proposed Tailoring Rule and proposed endangerment determination, EPA fully understands its actions to have enormous consequences under the CAA. This notice, by not taking comment on when EPA should take action to impose actual controls on emissions of GHGs under the CAA is deficient under 5 U.S.C. 553(b)(3). In effect, the proposed rulemaking ignores the elephant in the room. [OAR-2009-0472-7234.1, p.22]

[See Docket Number OAR-2009-0472-7234.1, pp.22-23 for detailed comments pertaining to: The Proposed Rule Violates the Administrative Procedure Act since EPA Did Not Seek Comment on When the Agency Should Act, By Virtue of this Rulemaking, to Make GHGs "Regulated Air Pollutants" Under the Clean Air Act]

Fuel Requirements
NPRA also notes and would incorporate by reference comments filed by the American Petroleum concerning proposed fuel requirements in the Section 202 Rule. Fuel specification changes have not been proposed in this rulemaking, however the proposed rule and Draft Technical Support Document describe vehicle engine and equipment options that EPA believes will require lowering current sulfur requirements. NPRA

believes there is inadequate lead time for such an action which would require considerable analysis and assessment for its impact on refineries. NPRA also supports API comments with respect to ethanol blended certification fuel, flexible fuel vehicle credits and dedicated alternative fuel vehicles. [OAR-2009-0472-7234.1, p.25]

NISEI Farmers League

The Nisei Farmers League submits these comments on behalf of growers, packers, and shippers in California, Oregon, Utah, and Washington. NFL represents more than 1,100 operations in these states. We did not intend to participate in this docket, as our primary focus relates to the effect of Greenhouse Gas (GHG) regulations on stationary sources. For this reason, we had not spent much effort evaluating this docket until the proposed Greenhouse Gas Tailoring Rule was filed on October 27, 2009.

The proposed Tailoring Rule is based on the assumption that the act of regulating GHG emissions from automobiles under the clean air act will trigger regulatory requirements affecting stationary sources of GHG emissions. In supporting documents for the Tailoring Rule, EPA estimates that without the Tailoring Rule, over 6 million stationary sources will become subject to Title V permitting requirements, at a cost of over 38 billion dollars.

It would seem logical that if the analysis in the Tailoring rule is correct, then the additional cost burden for stationary sources should be reflected in the economic analysis for this docket. To the best of our knowledge, the impact of this rulemaking on stationary sources was not considered.

Proper consideration of the complete cost picture is very important in this docket. This is especially true, considering that EPA could gain almost all of their GHG reductions from Automobiles through NHTSA' s CAFE standards. It would seem that if EPA used the CAFE standards to calculate GHG reductions, the GHG reductions would remain very comparable, yet the regulatory burden on stationary sources could be avoided.

The proposed Tailoring Rule uses the doctrine of 'absurd results' as a portion of the justification for the proposed rule. It would appear that the origin of the 'absurd result' lies in this very docket, and the solution to the 'absurd result' is achievable in this docket without significant loss of GHG reduction benefits.

EPA should review the economic benefit of this rule, considering all costs; both those currently in this docket, and those outlined in the proposed Tailoring Rule. In addition, EPA should clearly evaluate the benefit of regulations solely based on CAFE standards. Finally EP A should consider extending the comment period in this docket, considering the significant additional costs discussed in the Tailoring Rule proposal. [OAR-2009-0472-7142.1, pp.1-2]

Peabody Energy Company

In particular, Peabody believes that EPA has failed, as a part of the motor vehicle GHG rulemaking, to conduct a number of analyses required by Executive Orders and statutes of the highly significant economic and regulatory effects that will result from PSD

regulation of major source GHG emissions. Unless these analyses are produced and made subject to comment before the motor vehicle rule is finalized, the legal status of that rule will be in jeopardy. Moreover, apart from legal requirements and as a matter of sound regulatory policy, EPA should take the necessary steps to understand the consequences that will necessarily flow when the motor vehicle rule is finalized and numerous stationary sources become subject to GHG regulation under the PSD program. [OAR-2009-0472-7223.1, p.1]

Peabody understands that EPA has proposed the tailoring rule in order to defer PSD and Title V regulation for what that rule defines as small (non-major) GHG emitters – those whose potential to emit (PTE) CO2e emissions is less than 25,000 tons per year (tpy). Peabody further understands that the motor vehicle rule preamble asks that "concerned small entities" address their comments about PSD and Title V to the tailoring rule docket. Except as relevant to our comments here, Peabody will withhold its detailed comments on the small source issue for that docket. [OAR-2009-0472-7223.1, p.1]

However, Peabody's concern as to PSD impacts in the present docket relates not to the small-source emitters but to the major-source emitters. Except for defining the major source threshold at 25,000 tpy CO2e, the tailoring rule does not affect PSD regulation of major stationary sources of GHGs and indeed specifically states that normal PSD requirements will apply to such major sources. Thus, the motor vehicle rule is the EPA regulatory decision point that triggers PSD regulation of major-source emissions of GHGs and therefore, as a matter of law, EPA's responsibility to examine the PSD consequences of that decision on major sources arises here. Accordingly, Peabody directs its comments on the major source PSD issue to the present docket and urges EPA to re-notice the rule for further comment when it has produced the necessary studies. [OAR-2009-0472-7223.1, p.2]

PSD regulation will have two types of consequences for major-source GHG-emitters: it will result in significant Best Available Control Technology (BACT) requirements, and, at least in the near term, will make it very difficult to obtain needed PSD permits or permit modifications. [OAR-2009-0472-7223.1, p.2]

Regulating light-duty motor vehicle GHG emissions will have far-reaching economic and regulatory consequences by subjecting most of the nation's industrial production to GHG regulation under the PSD program

As the tailoring rule preamble explains, EPA's motor vehicle rule will make GHGs a regulated pollutant under the Clean Air Act (CAA) and will therefore trigger PSD regulation of major source GHG-emitters. According to the tailoring rule Technical Support Document (TSD), at the 25,000 tpy CO2e threshold, some 13,600 sources are major sources of GHG emissions throughout the economy. This represents the large majority of the nation's fossil fuel-fired industrial base and accounts for 87 percent of the CO2 emitted by every stationary source of any size in America. [OAR-2009-0472-7223.1,p .2] [See Docket Number OAR-2009-0472-7223.1, pp.2-4 for a detailed discussion on this issue.]

Despite the tailoring rule, regulating light-duty motor vehicle GHG emissions will have the further consequence for major sources of essentially making it impossible for them to obtain needed permits, at least in the near term

According to EPA, without the tailoring rule, regulation of GHGs triggered by the motor vehicle rule will result in sustained regulatory gridlock in the PSD and Title V programs. EPA says that "the number of [PSD] permit applications would increase by 150-fold, an unprecedented increase that would far exceed administrative resources." Moreover, "[p]ermitting authorities have estimated that it would take 10 years to process a PSD application, on average, and the resulting backlog would affect the permit applications for all sources, not just GHG emitters. This backlog would grow by tens of thousands each year following the triggering of PSD applicability." EPA estimates that there would be "some 6.1 million" Title V permit applications, a number that is "almost 100 times greater than what Congress expected," which would lead to "multi-year delays in permit issuance." [OAR-2009-0472-7223.1, p.4]

EPA also states that this regulatory gridlock would not be confined to just small sources. As EPA states, "a literal application of the 100/250 tpy thresholds would sweep into the PSD program tens of thousands of smaller sources that Congress did not intend to include, and the resulting strain on administrative resources would preclude the hundreds of larger sources that Congress did intend to be subject to the program from obtaining permits at least for an initial period of time." [OAR-2009-0472-7223.1, p.4]

EPA says that the tailoring rule will prevent these dire consequences from occurring, but that is not the case, at least in the near term. The tailoring rule preamble frankly recognizes that most states have adopted their own PSD programs. Although these programs are submitted to and approved by EPA as a part of the State Implementation Plan (SIP) process, these programs retain independent legal force under state law. According to EPA, "virtually all of [these state permit programs] establish the PSD permitting threshold at the 100/250-tpy level," and in fact "a few states have adopted lower permitting threshold levels." Similarly, "virtually all EPA approved SIPs establish the significance level for any new pollutant that it covers – including GHG emissions, if covered – at zero." This means that, under state law in most states, once GHGs become regulated pollutants, any major-source modification that increases GHG emissions by any amount will trigger PSD applicability. [OAR-2009-0472-7223.1, pp.4-5]

Under the tailoring rule, these state PSD provisions will no longer be enforceable as a matter of federal law. But, as EPA specifically states, the 100/250 tpy state thresholds and the zero state significance levels for CO2 will remain in effect as a matter of state law. Moreover, EPA says it will not issue a SIP Call, impose a Federal Implementation Plan, or take any other action that will require states to change their current thresholds and significance levels. Thus, absent state action to revise their PSD regulations, the regulatory gridlock that EPA predicts without the tailoring rule will occur anyway. [OAR-2009-0472-7223.1, p.5]

EPA seems to be counting on the states' unilaterally revising their PSD regulations, but EPA does not allow them any time to do so before GHGs become regulated pollutants triggering PSD and Title V requirements. Many states could take a year or more to change their regulations, and many require either legislative approval or legislative review of some kind. In the meantime, the regulatory gridlock that EPA predicts – for both large and small sources – will be a reality. Of course, EPA could defer the effectiveness of the motor vehicle rule until states have taken the necessary action, but that is not what EPA proposed in the tailoring rule. Under the regulatory structure EPA proposes to implement, a very large number of sources, both large and small, will become subject to PSD GHG requirements when the motor vehicle rule goes into effect, with the resulting regulatory quagmire, and that quagmire will abate only if and when most states amend their PSD rules. And indeed, since EPA will not compel states to change their rules, and instead takes the position that states can set any thresholds and significance levels below 25,000 tpy CO2e that they want, there is no assurance that states will in fact make the necessary changes. [OAR-2009-0472-7223.1, p.5]

The impact of this state of affairs will ripple through the economy. As permitting comes to a stop because of an overwhelmed permit system, or because of uncertainty as to applicable regulatory requirements, construction activity for new projects and for a variety of building and facility expansions and upgrades will be forced to cease. This may not be the result that EPA. [OAR-2009-0472-7223.1, p.5]

EPA cannot validly argue that it is not responsible for analyzing the costs of BACT controls for major source GHG emissions because of the state role in developing BACT requirements

States that administer their own PSD programs undoubtedly play a significant role in determining BACT controls for major source emitters. But that fact does not relieve EPA of the obligation to examine the likely costs of GHG BACT controls that will be made necessary as a result of EPA's decision to regulate GHG emissions from motor vehicles. [OAR-2009-0472-7223.1, p.9]

As confirmed by the Supreme Court, although states have discretion in making BACT determinations, that discretion is ultimately controlled and circumscribed by EPA. As required by the CAA, the Agency promulgated regulations requiring states that administer their own PSD programs to submit those programs to EPA for approval as a part of their SIPs. EPA may disapprove a state's PSD SIP and/or prevent construction of a project subject to PSD if a state, in EPA's view, incorrectly applies BACT requirements. According to the Court, EPA's authority "extends to ensuring that a state permitting authority's BACT determination is reasonable in light of the statutory guides." [OAR-2009-0472-7223.1, p.9]

Thus, since it is EPA that is triggering the GHG BACT requirement by promulgating the motor vehicle GHG rule, and since it is EPA's responsibility to ensure that states are conforming to the statutory BACT requirements that EPA is triggering, it is EPA's obligation to assess the resulting economic consequences. Although EPA at this time

perhaps cannot know exactly how stringent state BACT determinations will be, it can make reasonable assumptions both as to its own minimum requirements and as to likely states requirements. [OAR-2009-0472-7223.1, p.9]

SCANA Corporation

Either EPA has failed to evaluate the number of sources that could be affected once the Light-Duty Vehicle GHG Standards go into effect carefully, or it has recklessly disregarded the substantial, negative impacts. It would appear that EPA has grossly underestimated the number and types of facilities that will be impacted by the light-duty vehicle GHG proposal by making them subject to PSD pollutants and the Title V and PSD permitting requirements . The South Carolina Department of Health and Environmental Control (SCDHEC) has identified over 800 of [OAR-2009-0472-7316, p.1] the currently permitted small sources that they project would become subject to Title V and PSD permitting by virtue of the triggering provision as soon as GHGs become regulated under Light- Duty Vehicle GHG Standards. South Carolina currently has 281 Title V permitted facilities. Did EPA evaluate the effects of a tripling of the number of Title V permitted facilities, in South Carolina alone, including the resources required to process them? We are being told to prepare for a three year permitting process, assuming resources are available. In addition to this impact, even the most minor modification or expansion activity may trigger a Prevention of Significant Deterioration (PSD) technology review and modeling analysis. And the technology review would encompass all of the triggered PSD pollutants, not just GHG. [OAR-2009-0472-7316, p.2]

The GHG Tailoring rule is ill suited to address the problems caused when the Light-Duty Vehicle GHG Standards trigger the Title V and PSD permitting requirements. EPA must acknowledge that the GHG Tailoring rule may not even be in place at the time that EPA finalizes the Light-Duty Vehicle GHG Standards. EPA has stated clearly its intent to finalize the Light- Duty Vehicle GHG Standards by the end of March 2010. The public comment period on the GHG Tailoring rule ends on December 28, 2009. EPA undoubtedly will receive thousands of comments on the GHG Tailoring rule. It would be sheer folly to assume that it can consider and resolve those comments and finalize the rule in only three months, at least if EPA plans to conduct an honest and meaningful review of comments. No doubt, it will be a monumental task for EPA to review adequately all of the comments and make necessary, meaningful, and responsive revisions to the proposed rule. [OAR-2009-0472-7316, p.2]

Recommended Alternative: EPA should not establish GHG emission limits under Section 202(a) of the Clean Air Act. Instead, EPA and NHTSA should simply work together to establish fuel economy standards that accomplish the desired goals of substantial reductions in GHG emissions and improvements in fuel economy. If this simple and direct approach were taken, the other sections of the Clean Air Act (specifically Title V permitting and PSD permitting) would not be triggered. [OAR-2009-0472-7316, p.3]

[See Docket Number OAR-2009-0472-7316, pp.1-3 for detailed comments]

Sierra Research Inc.

[Sierra Research Inc. Submitted Docket Number OAR-2009-0472-7977.1 as a comment attachment regarding the NHTSA Proposal for Average Fuel Economy Standards Passenger Cars and Light Trucks Model Years 2011-2015, Sierra Research, Inc., June 27, 2008. No other comment document from Sierra Research Inc. was received.]

South Carolina Chamber of Commerce

Specifically, EPA has failed to carefully evaluate the number of sources that could be affected once the Light-Duty Vehicle GHG Standards go into effect . We feel that EPA has grossly underestimated the number and types of facilities that will be impacted by the light-duty vehicle GHG proposal by becoming subject to NSR pollutants and the Title V and NSR permitting requirements. While we continue to evaluate the specific impact to currently permitted South Carolina (SC) sources and will make comment to this effect to the 'tailoring rule,' South Carolina Department of Health and Environmental Control (SCDHEC) has identified over 800 of the currently permitted small sources that would become subject to Title V and NSR permitting as soon as GHGs are regulated under Light-Duty Vehicle GHG Standards. In comparison, SC currently has 281 Title V permitted facilities. In addition to this impact, even the smallest modification or expansion activity may trigger a Prevention of Significant Deterioration (PSD) technology review and modeling analysis. The technology review would encompass all of the triggered NSR pollutants, not just GHG. Economically, these facilities would have no choice but to abandon any new project or modification. It is interesting to note that many of these [OAR-2009-0472-7298, p.1] facilities would be subject to NSR and Title V permitting requirements because of natural gas combustion, which is considered to be a clean burning fuel. In addition, we would expect new construction to halt because of these new requirements. [OAR-2009-0472-7298, p.2]

EPA must not rely upon the GHG Tailoring rule to address the fact that the Light-Duty Vehicle GHG Standards trigger the Title V and NSR permitting requirements. Furthermore, EPA must acknowledge that the GHG Tailoring rule may not be in place at the time that EPA finalizes the Light-Duty Vehicle GHG Standards. EPA has clearly stated its intent to finalize the Light-Duty Vehicle GHG Standards by the end of March 2010. The public comment period on the GHG Tailoring rule ends on December 28, 2009. EPA is expected to get thousands of comments on the GHG Tailoring rule and it would have only three months to address those comments and finalize the rule. This appears to be a monumental task if EPA is going to adequately review all of the comments and make necessary revisions to the proposed rule in response to critical comments received. [OAR-2009-0472-7298, p.2]

EPA clearly believes that promulgation of the proposed Section 202(a) GHG rule will be extremely costly and a regulatory burden as evidenced by its preemptory promulgation of the Tailoring Rule. EPA explicitly states that the Tailoring Rule was promulgated for the sole purpose of addressing the paralyzing costs that would be borne by stationary sources in the wake of GHG regulation under Section 202(a). EPA notes in the Tailoring Rule

that as soon as the Section 202(a) GHG rule is finalized, 'GHGs subject to regulation under that rule would become immediately subject to regulation under the PSD program.' If EPA had conducted a proper impact analysis of the proposed Section 202(a) GHG rule, it would have included an assessment of the obvious burdens that would be placed on stationary sources via the PSD permitting trigger. EPA cannot simply extricate portions of its cost analysis in order to provide a rule that is more economically feasible. Such an approach is arbitrary and does not provide the minimal required support for EPA's rule. [OAR-2009-0472-7298, p.2]

The SC Chamber of Commerce believes that many existing facilities will need new Title V or PSD permits to replace, repair or improve the efficiency of aging equipment, including energy efficiency projects. Permitting delays will force facilities to evaluate the possibility of shutting down domestic operations and relocating to beyond the United States borders. Furthermore, small businesses, such as asphalt and concrete batch plants, metals manufacturing, the remaining textile industry, food packaging, wood products, even hospitals will be subject to many more requirements than they currently are (not just GHGs but also all other NSR pollutants). It will be significantly more costly for them to receive a permit and they will experience significant permit delays, discontinued construction and loss of jobs. This permitting process will grind economic development and industrial growth to a halt causing adverse consequences to an already struggling economy. [OAR-2009-0472-7298, p.3]

[See Docket Number OAR-2009-0472-7298, pp.1-3 for detailed comments]

South Carolina Department of Health and Environmental Control

It is critical that all potentially effected entities understand the impact of EPA regulating greenhouse gas emissions under the light-duty vehicle proposal. It will be too late to address any concerns that stationary (industrial) sources have in the 'tailoring rule' as they will already be subject to PSD, as defined in the Clean Air Act, once EPA regulates greenhouse gases from light-duty vehicles. There are fundamental issues related to the 'tailoring rule,' and EPA's continued message of the 'absurd results' and 'administrative burden' of not moving forward with a 'tailoring rule' only confuses the real situation as the thresholds being proposed are 'illegal' under the Clean Air Act and violate many state laws across the country. Any permit issued with thresholds higher than those within the Clean Air Act and current state laws would be vulnerable to appeal and litigation, even though EPA attempts to justify the tailoring rule by saying that by not doing so would create results 'so illogical or contrary to sensible policy as to be beyond anything that Congress could reasonably have intended.' We do not understand how EPA could know this and not also know that there is no guarantee their legal interpretation to exempt small sources or set different thresholds in the tailoring rule will not be challenged or if challenged, upheld in court. We are very concerned with EPA moving forward in this direction.

Again, we have significant concerns about the collateral effects of EPA moving forward at this time to regulate greenhouse gas emissions from light-duty vehicles. EPA must

fully evaluate the collateral impact this proposal would have on all other aspects of the Clean Air Act including, but not limited to, the impact on state and local air permitting authorities, business, industry and the economy to all areas of the country, but in particular states like South Carolina who still employ many people in the manufacturing sector. As they have not fully evaluated the impact to state and local permitting authorities, EPA has not met the requirements under the Unfunded Mandates Reform Act of 2005 for the light-duty vehicle GHG proposal. EPA even states in the tailoring rule for stationary sources, 'State permitting authorities would be paralyzed by permit applications in numbers that are orders of magnitude greater than their current administrative resources could accommodate' yet they have not taken this into consideration in the light-duty vehicle greenhouse gas proposal.

Finalizing this proposal would have a detrimental effect on our state's economy at a time when unemployment is currently at 12.1% and is only expected to increase. Once EPA 'regulates' greenhouse gas emissions from mobile sources, the Clean Air Act requires that stationary sources be regulated under the threshold requirements as specified within the Clean Air Act -regardless of any 'tailoring rule' EPA develops -as those thresholds are specified within federal law. States and local permitting authorities are wholly unprepared for the millions of entities who will be required to comply with the Clean Air Act once greenhouse gas standards are set by EPA on light-duty vehicles. Bottom line, the permitting process will become so backlogged as to create a permitting moratorium. New business and industry will not be built; existing business will not expand; and, existing business and industry will not repair equipment if such repairs would require a permit. Again, detrimental effects and unintended consequences with the minimum environmental benefit that would occur from EPA greenhouse gas standards on light-duty vehicles, as almost all of the environmental benefit comes from NHTSA's CAFE standards.[OAR-2009-0472-7202.1, p.3]

Again, we ask that EPA not move forward until further review and understanding of the full collateral impact of regulating greenhouse gases from tailpipes is completed and appropriate public participation is allowed. We also challenge EPA to take this opportunity to develop a well thought out, comprehensive, holistic, common sense approach to air quality management that focuses on environmental results and not process. [OAR-2009-0472-7202.1, p.6]

In summary the commenter is concerned about detrimental effect on state's economy, budget shortfalls and extra work load related to permitting.

South Carolina Manufacturers Alliance (SCMA)

ACCORDING TO EPA'S OWN LEGAL ANALYSIS, GHGS ARE NOT CURRENTLY POLLUTANTS 'SUBJECT TO REGULATION' UNDER THE CAA
As evidenced by EPA's legal analysis in its recently proposed rule reconsidering the December 18, 2008 'PSD Interpretive Memo', and supported by historic Agency practice and decisions of EPA officials, GHGs are not pollutants that are currently 'subject to regulation' under the CAA. EPA has long held that for a pollutant to be 'subject to

regulation' there must be actual control measures and not mere monitoring or reporting requirements. [OAR-2009-0472-7296, p.2]

Although GHGs are not currently 'subject to regulation' under the CAA, once EPA finalizes a rule to regulate GHG emissions under CAA Section 202, legal arguments can be made that other CAA regulatory requirements will be triggered, thus affecting stationary source CAA compliance. Due to the strong possibility that EPA could be legally compelled to regulate GHG emissions from stationary sources as a result of this regulation, it is unreasonable and arbitrary for EPA to not analyze impacts on the tens of thousands of sources that could be required to limit their GHG emissions. EPA has failed to conduct a proper impact analysis. [OAR-2009-0472-7296, p.1] Such an analysis would identify the significant burdens the rule would place on stationary sources and the resulting impact on jobs and the nation's economy. The CAA is not an appropriate vehicle to regulate GHGs and such a task is better left for the members of U.S. Congress to address. [OAR-2009-0472-7296, p.2]

[See Docket Number OAR-2009-0472-7296, p.2 for detailed comments]

IF GHGS ARE REGULATED UNDER SECTION 202 OF THE CAA, IT IS LIKELY THAT OTHER REGULATORY REQUIREMENTS WILL BE TRIGGERED [OAR-2009-0472-7296, p.2]
There are strong legal arguments that indicate that if the proposed Section 202(a) GHG rule is finalized it will generate an array of other regulatory requirements. Specifically, it is likely that regulation of GHGs under Section 202 will trigger requirements under the Prevention of Significant Deterioration (PSD) program. This is acknowledged by EPA in a proposed rule published in the Federal Register on October 27, 2009 (Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule; Proposed Rule) (the Tailoring Rule). In the opening paragraphs of the Tailoring Rule, EPA notes that that once GHGs are regulated under Section 202(a) PSD permitting requirements will immediately apply to stationary sources emitting GHGs above the significance threshold. [OAR-2009-0472-7296, p.3]

[See Docket Number OAR-2009-0472-7296, p.3 for detailed comments]

EPA HAS FAILED TO CONDUCT AN ADEQUATE ANALYSIS OF THE IMPACTS THAT THIS MOBILE SOURCE GHG RULE WILL HAVE ON STATIONARY SOURCES
EPA has failed to conduct a complete analysis of the impacts associated with regulating GHGs under Section 202(a) of the CAA. EPA has openly acknowledged that the promulgation of standards to control GHG emissions from light-duty motor vehicles under Section 202(a) will inevitably trigger PSD permitting requirements for stationary sources; nonetheless, EPA has not included in this proposal an impact analysis that addresses the effect this rule will have on stationary sources. This represents a major flaw in the proposed rule. [OAR-2009-0472-7296, p.3]

SCMA strongly requests that EPA not proceed with finalizing the proposed Section 202(a) GHG rule because the proposed rule will trigger other regulatory requirements, and EPA has failed to conduct a proper impact analysis . This rule and the other recent GHG regulatory proposals combined demonstrate clearly that EPA should defer action to allow the U.S. Congress to settle on a national approach through comprehensive legislation that is economy-wide, which will have a better chance of balancing the economy-altering changes that the proposed finding will ultimately bring. [OAR-2009-0472-7296, p.4]

[See Docket Number OAR-2009-0472-7296, pp.3-4 for detailed comments]

South Carolina Pulp & Paper Association (SCPPA)

SCPPA believes that EPA has tremendously underestimated the number and types of facilities that will be impacted by the light-duty vehicle GHG proposal (i.e., residential home heating gas-fired furnaces above 0.5 million BTU/hour would trigger the major source thresholds for GHGs). We question whether EPA has adequately evaluated the consequences and collateral impacts of the proposed rule and request that EPA delay any action until further analysis and understanding of these impacts has been completed. [OAR-2009-0472-7479, p.1]

Even the smallest modification, energy efficiency project, or expansion activity at our facilities could trigger a Prevention of Significant Deterioration (PSD) technology review and modeling analysis. The technology review would encompass all of the triggered NSR pollutants, not just GHG. Economically, our facilities may have no choice but to abandon any new project or modification. [OAR-2009-0472-7479, p.1]

EPA must not rely upon the GHG Tailoring rule to address the fact that the Light-Duty Vehicle GHG Standards trigger the Title V and NSR permitting requirements. While this sort of rule would reduce the impacts of EPA's adoption of the GHG tailpipe standards to a degree, the impacts on businesses and regulatory authorities would still be dramatic, and they would be a direct result of the proposed GHG tailpipe standards for which EPA has never completed a statutorily required impact analysis. Furthermore, EPA must acknowledge that the GHG Tailoring rule may not be in place at the time that EPA finalizes the Light-Duty Vehicle GHG Standards, or may be rejected by the court as arbitrary and capricious and beyond EPA's Clean Air Act authority. [OAR-2009-0472-7479, p.2]

SCPPA believes that many existing facilities will need new Title V or PSD permits to operate, replace, repair or improve the efficiency of aging equipment, including energy efficiency projects. Permitting delays will force facilities to evaluate the possibility of shutting down domestic operations and relocating outside the United States. Furthermore, our smaller wood products facilities will be subject to many more requirements than they currently are (not just GHGs but also all other NSR pollutants). It will be a significant cost for them to receive permits and they will experience significant permit delays, discontinued operation, and loss of jobs. This permitting process will grind economic

development and industrial growth to a halt causing adverse consequences to an already struggling economy. [OAR-2009-0472-7479, p.2]

Recommendation
SCPPA believes that EPA should not establish GHG emission limits under Section 202(a) of the Clean Air Act. EPA should take into consideration that the new NHTSA CAFE standards accomplish the goals of the Light-Duty Vehicle GHG Standards and EPA should not finalize any GHG emission standards under the authority of the Clean Air Act. Virtually all of the GHG emission reductions required by the Light-Duty Vehicle GHG Standards come from the improvement to NHTSA's CAFE standards. Therefore, the additional EPA regulation comes at an enormous cost with virtually no additional environmental benefits. [OAR-2009-0472-7479, p.2]

Southeastern States Air Resource Managers, Inc. (SESARM)

We do, however, have significant concerns with the subject rule as currently proposed, primarily due to expected impacts from it triggering other sections of the Clean Air Act, specifically New Source Review (NSR) and Title V permitting. We do not believe that EPA has thoroughly examined these impacts. We further do not believe that EPA has adequately evaluated the options for minimizing, or avoiding, these collateral impacts. Our concerns are described herein along with recommended changes that will still produce the intended results of the proposed rule while minimizing or avoiding these collateral impacts. [OAR-2009-0472-7137.1, p.2]

EPA must evaluate, as a part of this rulemaking, whether or not other sections of the Clean Air Act will be triggered by this rule. If so, EPA must evaluate as part of this rulemaking the impacts of such triggering. Our understanding is that this rulemaking is the action that will trigger future requirements for permitting of GHGs under the NSR and Title V programs. However, in the proposed rule, EPA actually suggested that "small entities" should not comment on the triggering issue in this rulemaking, but should instead submit comments on the proposed "Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule" (GHG Tailoring Rule).1 We believe that EPA was in error to suggest this point and that it may inappropriately influence small entities, other affected sources, and permitting agencies to refrain from commenting on an important rulemaking. The EPA GHG Tailoring Rule is a wholly independent rulemaking from the Light-Duty Vehicle GHG Standards Rule. The GHG Tailoring Rule does not trigger the NSR and Title V permitting requirements; the Light-Duty Vehicle GHG Standards Rule does. [OAR-2009-0472-7137.1, p.2]

EPA failed to take into account in the Light-Duty Vehicle GHG Standards Rule the length of time that it may take for permitting authorities with SIP-approved NSR programs to go through rulemaking (which requires approval of state legislatures in some cases), hiring, and training in order to implement the mandate of regulating GHG emissions under the NSR and Title V permitting programs. [OAR-2009-0472-7137.1, p.2]

The GHG Tailoring Rule appears to be legally vulnerable and may not provide intended relief from the NSR Prevention of Significant Deterioration (PSD) and Title V statutory permitting thresholds. If the GHG Tailoring Rule is not finalized in time or is stayed or vacated by the courts, the workload for permitting authorities will increase exponentially at a time when state and local governments are experiencing severe budgetary challenges due to the current economic climate. [OAR-2009-0472-7137.1, p.3]

EPA has failed to evaluate and quantify fully the effects of the proposed Light-Duty Vehicle GHG Standards Rule on state and local air permitting authorities. More specifically, EPA does not appear to have complied fully with the Unfunded Mandates Reform Act of 1995. EPA states in the preamble that this rule only affects manufacturers of cars and light trucks. However, the proposed rule, if finalized as currently proposed, has the potential to affect state and local air permitting authorities immensely because it would cause GHG emissions to become regulated under the NSR and Title V permitting programs. The proposed rule does not take this into account. The potential impact to state and local air permitting authorities is unprecedented and enormous. [OAR-2009-0472-7137.1, p.3]

EPA claims that the proposed Light-Duty Vehicle GHG Standards Rule imposes no enforceable duty on any state, local or tribal governments. While the rule may not impose duties on governments as regulated entities, the negative impact of the rule on state and local permitting agencies cannot be overemphasized. As stated previously, the GHG Tailoring Rule acknowledges that state permitting authorities will be "paralyzed" by the workload created by the triggering of the NSR and Title V permitting provisions for GHG emissions. [OAR-2009-0472-7137.1, p.4]

In the final Light-Duty Vehicle GHG Standards Rule, EPA should avoid or minimize the impacts of the triggering effect. EPA can accomplish the goals of this rule without triggering NSR and Title V permitting. [OAR-2009-0472-7137.1, p.4]

Virtually all of the GHG emission reductions required by the proposed Light-Duty Vehicle GHG Standards Rule will come from improvements in NHTSA's CAFE standards. EPA acknowledges that the only way to reduce CO2 emissions from light-duty vehicles is to increase fuel economy and that there are no emission control technologies that reduce CO2 emissions from light-duty vehicles. EPA states in the proposed rule that N2O and CH4 emissions are low and that the proposed rule is not designed to require technology to reduce emissions of these compounds. EPA then justifies the inclusion of the proposed emission standards with a seemingly conflicting statement that the agency is concerned about those emissions increasing in the future. Because of the enormous collateral consequences of regulating GHG emissions under the Clean Air Act at this time and because the proposed rule does not require reductions of N2O or CH4 emissions, EPA should not finalize emission standards for N2O or CH4 as part of this rulemaking. [OAR-2009-0472-7137.1, p.5]

As an alternative, should EPA promulgate GHG emission limits under Section 202(a) of the CAA, it may be possible to defer regulation of GHG emissions until the first vehicle

model year required by the Light-Duty Vehicle GHG Standards Rule. [OAR-2009-0472-7137.1, p.5]

Spurgeon, C. M.

To make matters worse, these regulations would start a regulatory cascade. EPA would start regulating emissions from millions of sources, including large buildings, churches, sports arenas, office buildings, farms, schools, hospitals—you name it. EPA will be forced to regulate greenhouse gases with many sections of the Clean Air Act, including sections 108, 111, and 112. This will further harm our economy, reduce American jobs, and worsen our employment situation. NHTSA already has the ability to regulate fuel economy without EPA further harming the economy. [OAR-2009-0472-7092.1, p. 2]

Stanton, Neil

To make matters worse, these regulations would start a regulatory cascade. EPA would start regulating emissions from millions of sources, including large buildings, churches, sports arenas, office buildings, farms, schools, hospitals—you name it. EPA will be forced to regulate greenhouse gases with many sections of the Clean Air Act, including sections 108, 111, and 112. This will further harm our economy, reduce American jobs, and worsen our employment situation. NHTSA already has the ability to regulate fuel economy without EPA further harming the economy. [OAR-2009-0472-10169, p.2]

Texas Chemical Council (TCC)

TCC opposes EPA's promulgation of the proposed light-duty vehicle rule because of significant concerns with the rulemaking process with respect to EPA's failure to perform an adequate review and analysis of the regulatory burdens and costs of this proposed rulemaking thereby depriving the public the opportunity to comment. In addition, we believe that the CAA was not designed, nor is it functionally suited, for the regulation of GHG emissions from mobile or stationary sources. Furthermore, moving forward with the rule is unnecessary since the corporate average fuel economy (CAFE) standard proposed by the National Highway Traffic Safety Administration will accomplish the same environmental benefits, but without the administrative and permitting burden that regulation of GHGs under the CAA is sure to cause. Finally, any regulation of GHG emissions under the CAA would harm the economic viability or the Texas chemical industry. [OAR-2009-0472-7290, p.2]

The Proposed Rule Contains Significant Procedural Deficiencies
In the proposed § 202 rulemaking, EPA considers the impact of the proposal on car and truck manufacturers, but provides insufficient review and analysis of the impact of this rule on stationary sources. The following statutes and Executive Orders require EPA to fully and transparently consider all regulatory costs and impacts of its proposed rules: Paperwork Reduction Act, Regulatory Flexibility Act, Unfunded Mandates Act, and Executive Orders 12866 (regulatory planning and review), 13132 (federalism implications), 13175 (coordination with Indian tribal governments) and 13211 (impacts

on energy use, supply and distribution). In the proposed rule, EPA is legally required to consider the full regulatory impact of its action on stationary sources and cannot rely on other proposed rulemakings to provide that analysis. [OAR-2009-0472-7290, p.3]

[See Docket Number OAR-2009-0472-7290, pp.2-3 for detailed comments]

The CAA was Not Designed for the Regulation of GHG Emissions
TCC strongly believes that the CAA is not the appropriate tool for regulating GHG emissions from mobile or stationary sources. Furthermore, there is no compelling reason - legal or otherwise - for EPA to proceed down this road at this time. In the Massachusetts decision, the Court gave EPA wide flexibility in the manner, timing, content and coordination of it regulations. Particularly in light of the fact that the U.S. House of Representatives has passed GHG cap-and-trade legislation, and the U.S. Senate is deliberating similar legislation, EPA should wait for Congress to proceed before it swiftly moves to regulate GHG emissions under a permitting mechanism that was not constructed, nor intended, to tackle the regulation of the vast number of sources that emit GHGs.

[See Docket Number OAR-2009-0472-7290, pp.3-6 for detailed comments]

Regulation of GHG Emissions under the CAA Would Harm the Texas Chemical Industry
The Texas chemical industry is a leader in our state's economy. Our industry provides almost 600,000 direct and indirect jobs to Texans across the state. These jobs generate $27.3 billion in earnings. The chemical industry has invested more than $50 billion in physical assets in the state and pays over $1 billion annually in state and local taxes. Chemicals are also the state's number one export at over $30 billion annually. The products manufactured in Texas account for 60% of the U.S. chemical production, which go into millions of consumer products and many of which go into energy-efficient, high performance technologies and products for Texas and the rest of the nation, such as insulation, wind and solar power equipment, lightweight vehicle parts, compact fluorescent light bulbs and energy-efficient appliances. [OAR-2009-0472-7290, p.6]

[See Docket Number OAR-2009-0472-7290, pp.6-8 for detailed comments]

Texas Cotton Ginners Association

The proposed Tailoring Rule is based on the assumption that the act of regulating GHG emissions from automobiles under the clean air act will trigger regulatory requirements affecting stationary sources of GHG emissions. In supporting documents for the Tailoring Rule, EPA estimates that without the Tailoring Rule, over 6 million stationary sources will become subject to Title V permitting requirements, at a cost of over 38 billion dollars.

It would seem logical that if the analysis in the Tailoring rule is correct, then the additional cost burden for stationary sources should be reflected in the economic analysis

for this docket. To the best of our knowledge, the impact of this rulemaking on stationary sources was not considered.

The proposed Tailoring Rule uses the doctrine of 'absurd results' as a portion of the justification for the proposed rule. It would appear that the origin of the 'absurd result' lies in this very docket, and the solution to the 'absurd result' is achievable in this docket without significant loss of GHG reduction benefits. [OAR-2009-0472-7081.1, pp.1-2]

Texas Department of Agriculture

I am specifically concerned that the GHG provisions included in the motor vehicle proposal may impose Prevention of Significant Deterioration (PSD) and Clean Air Act Title V permitting requirements on a host of stationary sources . In the proposed PSD tailoring rules, EPA estimates that nationwide 'small sources' will be subject to approximately $38 billion in permitting costs under the Title V program. [OAR-2009-0472-7300, p.1]

Texas Industry Project (TIP)

Global climate change is a serious issue that is best addressed through concerted international action and/or comprehensive federal legislation, rather than through unilateral agency regulation under the current Clean Air Act ("CAA" or the "Act"). Not only did the Supreme Court make clear in Massachusetts v. EPA that the U.S. Environmental Protection Agency ("EPA" or the "Agency") has substantial discretion regarding the timing of any rules, but the Court of Appeals for the District of Columbia ("D.C. Circuit") subsequently denied a petition to compel EPA action in response to Massachusetts v. EPA. [OAR-2009-0472-7430.1, p. 1]

More importantly, Congress is moving forward quickly on comprehensive legislation that would address the problem of climate change outside of the structure of the current Act. Despite a clear need to proceed with the utmost caution in this important area, EPA has proposed to regulate GHG emissions from motor vehicles in the Proposed Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards (the "Motor Vehicle GHG Rule"). Under EPA's current interpretation of the CAA, the Motor Vehicle GHG Rule may (as EPA has stated in the Proposed PSD and Title V GHG Tailoring Rule (the "PSD Tailoring Rule") trigger regulation of GHG emissions from millions of stationary sources, including hundreds of thousands of Texas sources, many of which have never before been regulated under the Clean Air Act ("CAA"). [OAR-2009-0472-7430.1, p. 1]

The Motor Vehicle GHG Rule, as well as its companion, the PSD Tailoring Rule, are fundamentally flawed, both procedurally and substantively, and Texas, as the nation's leading energy producer and a leader in chemical manufacturing and agriculture, could be significantly impacted by these federal rulemakings. Most notably, EPA completely failed to evaluate the burdens of triggering PSD and Title V for GHG emissions under the required federal regulatory review statutes and Executive Orders. Furthermore, even had

the Agency conducted the required burden analysis, the rule is unlawful, would devastate the Texas and national economies, and the burdens of regulating GHGs under CAA Section 202 far outweigh the insignificant environmental benefits of the GHG emission standards. [OAR-2009-0472-7430.1, pp. 1-2]

Accordingly, for all of the reasons discussed in these comments, EPA should withdraw the Motor Vehicle GHG Rule, and proceed with caution going forward by allowing both the international community and Congress time to develop a comprehensive and sensible approach to the global problem of climate change. [OAR-2009-0472-7430.1, p. 2]

[See OAR-2009-0472-7430.1, pp. 2-11 for comments related to PSD and NRS for stationary sources in Texas. These comments include the following topics: A. The Motor Vehicle GHG Rule Will Disproportionately Harm Texas, B. EPA Utterly Failed to Account for these Devastating Impacts to Texas and the Entire U.S. in its Burden Analysis of the Motor Vehicle GHG Rule, C. A Full Analysis of Actual Impacts on Sectors Beyond Autos Would Demonstrate That the Rule Cannot be Justified—the Burdens Associated with the Motor Vehicle GHG Rule Would Devastate the Texas Economy, D. EPA Should Adopt a More Reasonable Interpretation of the Clean Air Act Under which the Final Motor Vehicle GHG Rule Would Not Trigger PSD For Stationary Sources, and E. Nothing Compels EPA to Action under Section 202 at this Time—the Rule Provides Little or No Benefit and Produces Overwhelming Burdens.]

Texas Oil and Gas Association

Introduction
EPA's statement in the PSD Tailoring Rule that the Motor Vehicle GHG Rule will trigger regulation of GHG emissions from millions of stationary sources has substantive implications for TxOGA members. EPA claims that the PSD Tailoring Rule offers relief and "lessens the regulatory burden" associated with regulating GHG emissions under the ill-suited federal Clean Air Act ("CAA"). However, the proposed rule will actually impose burdens on stationary sources, including sources operated by TxOGA members. The PSD Tailoring Rule relies on questionable legal doctrines, rarely, if ever, relied on by courts, violates a host of procedural statutes and executive orders, and is ineffective on its face, as it fails to address PSD [OAR-2009-0472-11275.1, p.1] and Title V thresholds in corresponding state rules. Accordingly, TxOGA recommends that EPA withdraw the PSD Tailoring Rule and instead adopt a more rational interpretation of the CAA. [OAR-2009-0472-11275.1, p.2]

[See docket number OAR-2009-0472-11275.1, p.1&2 for detailed comments]

By Declining to Extend the Comment Periods for its GHG Rulemaking, EPA has Deprived TxOGA of a Meaningful Opportunity to Comment on the Motor Vehicle GHG Rule and the PSD Interpretive Reconsideration
On November 18, 2009, a group of trade associations led by the National Association of Manufacturers ("NAM") submitted a request to EPA to extend the comment deadlines for the Motor Vehicle GHG Rule, the PSD Interpretive Reconsideration, and the PSD

Tailoring Rule. EPA denied NAM's request. As a result, and as explained in more detail below, TxOGA has been deprived of an adequate opportunity to comment on the Motor Vehicle GHG Rule and the PSD Interpretive Reconsideration. Accordingly, TxOGA respectfully requests that EPA consider the instant comments on the PSD Tailoring Rule timely filed in both of the other GHG Rulemaking dockets. [OAR-2009-0472-11275.1, p.2]

[See docket number OAR-2009-0472-11275.1, p.2&3 for detailed comments pertaining to: The Close-Timing of the GHG Rulemaking Precluded A Thorough and Sufficient Analysis of the Rules and Public Notice Was Inadequate Regarding the Motor Vehicle GHG Rule's Impacts on Stationary Sources]

EPA's Conclusion That PSD Is Automatically Triggered By the Motor Vehicle GHG Rule Misinterprets the CAA
The PSD Tailoring Rule provides that PSD requirements will be triggered when the Motor Vehicle GHG Rule is finalized. However, the Agency relies on two questionable legal conclusions to support its factual findings that GHG emissions alone can trigger PSD permit requirements and the conclusion that, absent an "administrative necessity"-based regulatory relief rule, there will be 40,000 new PSD applications per year. These conclusions are: [OAR-2009-0472-11275.1, p.3]

The CAA requires that GHGs, as regulated pollutants, be considered in determining whether a source is a major source for purposes of PSD, even though there is no NAAQS for GHGs; and [OAR-2009-0472-11275.1, p.3]

If a source is major for GHGs, it is therefore major for all other regulated pollutants – the "major for one, major for all" policy that EPA has applied in the past to all but nonattainment NSR pollutants under the program. [OAR-2009-0472-11275.1, p.3]

[See docket number OAR-2009-0472-11275.1, pp.3-7 for detailed comments pertaining to: The CAA Limits PSD Applicability for GHGs to (1) Areas Designated as Attainment or Unclassifiable Under a GHG NAAQS or (2) Sources that Require a PSD Permit Based on Emissions of a Criteria Pollutant That Also Will Experience a Significant Increase in GHG Emissions, Alabama Power Supports the Interpretation that a NAAQS is Required as a Prerequisite to Regulation Under the Clean Air Act, and EPA Can Implement the Proper Scope of PSD Applicability Under the Existing Regulations]

Alternatively, EPA Should Interpret the Term "Pollutants Subject to Regulation" to Refer Only to Pollutants With Local or Regional Impacts
EPA should construe the phrases "any pollutant" in Section 169(1) and "any pollutant subject to regulation" in Section 165(a) to refer only to conventional pollutants whose emissions have regional or local impact, rather than any pollutant subject to regulation under the Act. Such an interpretation would automatically exclude GHGs, which are "global in nature because the GHG emissions emitted from the United States . . . become globally well-mixed." In the PSD Tailoring Rule, EPA's own analysis—which demonstrates that Congress could not have intended those CAA sections to require PSD

applicability for GHGs, because, if they did, the number of sources requiring PSD permits would rise to absurd and unanticipated levels— supports this interpretation. EPA proposes only one solution to avoid the absurdity of triggering PSD for GHGs: rewriting the statutory PSD and Title V applicability thresholds and significance levels. [OAR-2009-0472-11275.1, p.7]

[See docket number OAR-2009-0472-11275.1, pp.7-8 for detailed comments]

The PSD Tailoring Rule is Not a Relief Rule and Requires a Full Regulatory Impacts Analysis
The PSD Tailoring Rule avoids a full regulatory impacts analysis on the basis that the Rule is a "relief rule." To the contrary, EPA's decision to interpret "subject to regulation" such that motor vehicle emission standards will trigger PSD applicability for 40,000 new PSD permit applications and six million new Title V sources creates massive burdens for stationary sources. TxOGA members will experience significant impacts, including increased costs in complying with these new requirements and lengthy delays and/or a complete shut-down of new projects and project-expansions due to the Texas Commission on Environmental Quality's ("TCEQ's") inability to process the influx of new PSD and Title V permit applications. These added costs of doing business and the effective permit moratorium will result in lost jobs and lost profits for TxOGA members. [OAR-2009-0472-11275.1, p.8]

[See docket number OAR-2009-0472-11275.1, pp.8-13 for detailed comments pertaining to: Even if the PSD Tailoring Rule Offers Limited Relief for Small Sources of GHG Emissions, EPA Must Account for the Remaining Substantial Burdens Imposed by the Rule, By Failing to Assess Costs, the PSD Tailoring Rule Violates a Host of Statutes and Executive Orders That Require Analysis and Public Review of Regulatory Burdens, and The Burden Analysis for Title V was Deficient—EPA's Reliance on States' Ability to Assess Permit Fees to Cover Additional Title V Permitting Costs is Contrary to the Statute]

EPA Cannot Justify the Tailoring Rule Under the Limited and Narrow "Absurd Results" or "Administrative Necessity" Doctrines [OAR-2009-0472-11275.1, p.14]

[See docket number OAR-2009-0472-11275.1, pp.14-16 for detailed comments pertaining to: EPA's Reliance on the "Administrative Necessity" Doctrine is Unsupported by Law and EPA has Misapplied the Doctrine of Absurd Results]

EPA's Tailoring Rule Is Facially Invalid Because It Proposes to Illegally Rewrite SIP and Title V Approvals
To implement its proposed approach, EPA imagines a broad, multi-state SIP revision, retroactively inserting new major source and modification thresholds into a majority of the states' existing, approved SIPs. EPA is not suggesting that any state has asked for such a revision. Instead, EPA is announcing an assumption—that states lack the resources to implement EPA's view of the new challenge it is creating—and inserting into the states' plans EPA's chosen approach to managing the challenge. EPA is rewriting the

states' SIPs, an approach that turns on its head the structure that Congress established for SIP planning. The implications of this approach would reach well beyond the current issue, and would contravene settled law on the role of EPA and the states in SIP planning. [OAR-2009-0472-11275.1, p.17]

[See docket number OAR-2009-0472-11275.1, p.17-19 for detailed comments pertaining to: The PSD Tailoring Rule's Retroactive Re-interpretation of SIP and Title V Submittals and Approvals That Occurred Years (and in Some Cases Decades) Ago Violates Established CAA SIP Revision Procedures and is Unlikely to be Sustained by the Courts and Even if EPA Could Accomplish the Reinterpretation of SIPs and State Title V Programs Under Federal Law, the PSD Tailoring Rule Provides No Burden Relief Because States Will be Obligated to Follow Adopted State Regulations and Apply the 100/250 Ton Thresholds]

If EPA Concludes that the CAA and PSD Must Apply to GHGs, EPA Cannot Choose "Winners and Losers" Among Different Regulated Entities by Ignoring Clear CAA Definitions. EPA's Decision to Set the Thresholds Between 10,000 and 25,000 Tons CO2e/Year is Arbitrary and Capricious
Finally, EPA's selected major source thresholds of 25,000 tpy for PSD and Title V and significance level of 10,000-25,000 tpy for PSD are arbitrary and capricious because there is no health and/or welfare basis for these cut-offs. GHGs, such as CO2, are distributed roughly equally throughout the global atmosphere. As a result, localized emissions, unlike emissions of other pollutants currently regulated under the Act, have no direct effect on the region that is the source of the emissions. This stands in sharp contrast to the pollutants currently regulated under the CAA (e.g., ozone), which create local air quality problems. Therefore, GHG emissions should be viewed on a global scale for purposes of setting applicability thresholds and significance levels. [OAR-2009-0472-11275.1, p.19]

[See docket number OAR-2009-0472-11275.1, pp.19-20 for detailed comments]

Finally, Nothing Compels EPA to Action under Section 202 at this Time—the Rule Provides Little or No Benefit and Produces Overwhelming Burdens
EPA has clear legal authority to defer promulgation of Section 202 GHG emission standards thereby avoiding the need for the PSD Tailoring Rule altogether, even now that the Agency has proceeded to finalize the endangerment and cause or contribute findings under CAA Section 202. Massachusetts v. EPA recognizes that EPA retains significant discretion regarding timing of rules. And in fact, it would be arbitrary and capricious for EPA to not exercise this discretion because the economic consequences of the Motor Vehicle GHG and PSD Tailoring Rules are so disastrous, while the GHG emission standards themselves will not yield any benefits distinct from the Department of Transportation's ("DOT") proposed corporate average fuel economy ("CAFÉ") standards. There are numerous compelling reasons to defer promulgating motor vehicle GHG emission standards at this time. [OAR-2009-0472-11275.1, p.20]

[See docket number OAR-2009-0472-11275.1, pp.20-21 for detailed comments pertaining to: The Benefits of the Section 202 GHG Emission Standards Could be Largely Achieved Through CAFE Standards Alone and Delaying Promulgation Would Avoid 'Absurd' and 'Impossible' Results]

Utility Air Regulatory Group

Because EPA Has Not Established that Its Proposed Section 202(a) Rules Will Avert to Any Significant Extent the Endangerment EPA Proposes To Find -- and, to the Contrary, Has Presented Information that Shows Those Rules Will Not Meaningfully Address That Endangerment -- EPA Lacks Any Statutory Basis for Promulgating Those Rules. [OAR-2009-0472-7262.1, p.8. Full discussion on pp.8-10]

EPA's Proposed Motor Vehicle Rules Would Be Essentially Duplicative of NHTSA's Proposed Standards and, in Any Event, the Projected Effects of the Joint Program Are Too Slight To Fruitfully Attack Any Climate-Related Endangerment. [OAR-2009-0472-7262.1, p.11. Full discussion on pp.11-16]

Agency Analyses of the Environmental and Economic Impacts Associated with the Joint Motor Vehicle Proposal Are Either Entirely Absent or Substantially Deficient; EPA Must Prepare Proper Analyses for Public Review and Comment If It Decides To Proceed with This Rulemaking. [OAR-2009-0472-7262.1, p.16. Full discussion on pp.16-21]

EPA Must Take Into Account Reasons Why Promulgation of Final Section 202(a) Rules for GHGs Should Not Trigger PSD and Title V Permitting Requirements. [OAR-2009-0472-7262.1, p.16. Full discussion on pp.21-24]

For all of the foregoing reasons, and those presented in UARG's other comments, EPA must withdraw its proposed motor vehicle rules (and NHTSA should revise its regulations, if necessary, to address this change). If EPA decides nevertheless to proceed with its rulemaking, it must prepare and publish a supplemental notice of proposed rulemaking that corrects the deficiencies in the proposed rules as described in these comments.

Western Agricultural Processors Association

The Western Agricultural Processors Association submits these comments on behalf of the tree nut processing industry in California. WAPA did not intend to participate in this docket, as our primary focus relates to the effect of Greenhouse Gas (GHG) regulations on stationary sources. For this reason, we had not spent much effort evaluating this docket until the proposed Greenhouse Gas Tailoring Rule was filed on October 27, 2009.

The proposed Tailoring Rule is based on the assumption that the act of regulating GHG emissions from automobiles under the clean air act will trigger regulatory requirements affecting stationary sources of GHG emissions. In supporting documents for the Tailoring Rule, EPA estimates that without the Tailoring Rule, over 6 million stationary sources

will become subject to Title V permitting requirements, at a cost of over 38 billion dollars.

It would seem logical that if the analysis in the Tailoring rule is correct, then the additional cost burden for stationary sources should be reflected in the economic analysis for this docket. To the best of our knowledge, the impact of this rulemaking on stationary sources was not considered.

Proper consideration of the complete cost picture is very important in this docket. This is especially true, considering that EPA could gain almost all of their GHG reductions from Automobiles through NHTSA' s CAFE standards. It would seem that if EPA used the CAFE standards to calculate GHG reductions, the GHG reductions would remain very comparable, yet the regulatory burden on stationary sources could be avoided.

The proposed Tailoring Rule uses the doctrine of 'absurd results' as a portion of the justification for the proposed rule. It would appear that the origin of the 'absurd result' lies in this very docket, and the solution to the 'absurd result' is achievable in this docket without significant loss of GHG reduction benefits.

EPA should review the economic benefit of this rule, considering all costs; both those currently in this docket, and those outlined in the proposed Tailoring Rule. In addition, EPA should clearly evaluate the benefit of regulations solely based on CAFE standards. Finally EP A should consider extending the comment period in this docket, considering the significant additional costs discussed in the Tailoring Rule proposal. [OAR-2009-0472-7140.1, p.1]

Wood, John

In addition, under this regulation, the EPA would have the authority to regulate not only moving, but also stationary emitters of carbon dioxide. This would include almost everything that releases carbon dioxide; obvious ones like factories, businesses, and farms; and not-so-obvious ones, like schools, hospitals, and housing areas. This would also allow the government to step in and control things which they are not meant to control, such as churches or other places of worship. This regulatory cascade would therefore allow the government to control almost every facet of our lives. [OAR-2009-0472-7157.1, p.3]

EPA Response:

As indicated by the above comment summaries, EPA received numerous comments on issues related to the impacts on stationary sources, due to the Clean Air Act's provisions for permitting requirements related to the issuance of the GHG standards for new motor vehicles. These comments fall into several categories of issues: 1) comments related to EPA's interpretation of the CAA's provisions for subjecting stationary sources to permit regulation after GHG standards are set; 2) comments suggesting that EPA should fully assess (or had underestimated) the stationary source permitting impacts before finalizing the GHG vehicle rule; 3) comments suggesting that EPA did not adequately consider the permitting impact on small business sources; 4) comments suggesting that EPA should defer setting GHG standards for new motor vehicles to avoid any stationary source

permitting impacts; 5) comments stating that EPA failed to provide adequate public notice under section 307(d) of the Clean Air Act and the Administrative Procedure Act; and 6) comments related to the impacts on state and local air agencies in issuing stationary source permits .

The first category of comments pertains to EPA's interpretation of the CAA's provisions for when pollutants are "subject to regulation" for the purposes of the federal PSD permitting program after this rule is promulgated. This issue is addressed in EPA's final action on Reconsideration of Interpretation of Regulations that Determine Pollutants Covered by Clean Air Act Permitting Programs ("permitting program interpretation"), which was issued on March 29, 2010. Among other things, the Agency's final permitting program interpretation explains that the PSD permitting requirements will not apply to a newly regulated pollutant until a regulatory requirement to control emissions of that pollutant "takes effect." In addition, the permitting program interpretation addresses several questions regarding the applicability of the PSD and Title V permitting programs to GHGs upon the promulgation of EPA regulations establishing limitations on emissions of GHGs from vehicles under Title II of the CAA. As explained in the permitting program interpretation, EPA has determined that PSD and Title V permitting requirements will not apply to GHG emissions until at least January 2, 2011, which is the earliest date by which model year 2012 vehicles meeting the proposed GHG standards can be sold in the United States. This determination is consistent with the request made by a number of commenters here, including the National Climate Coalition.

The second category of comments suggests that EPA must fully assess the permitting impacts on stationary sources, including its estimates of how many sources are likely to be subject to GHG permitting requirements. These are issues that EPA is addressing in developing its final action on the proposed Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 74 FR 55292 (October 27, 2009) ("Tailoring Rule"). The various comments on consideration of the economic impacts of the PSD permitting provisions fail to recognize that any analysis of such impacts would not aid EPA in determining what GHG standards to adopt in this rulemaking. Impacts on stationary source are not related to any of the issues EPA needs to consider and decide in determining the content of the GHG standards that will apply to automobile manufacturers. The same response applies to those commenters stating that EPA must assess impacts on stationary sources in this rule if it is promulgated before the tailoring rule. Analyses of indirect impacts on stationary sources are not legally relevant to the standard setting issues under consideration in this rule. Moreover, as noted above, EPA has determined in the permitting program interpretation that GHGs will not be air pollutants "subject to regulation" earlier than January 2, 2011, consistent with the GHG control requirements finalized in this rule. In addition, EPA plans to finalize the Tailoring Rule in the very near future, and the final Tailoring Rule will address the applicability of PSD requirements for GHG-emitting stationary sources that are not presently subject to PSD permitting. EPA addresses below the separate issue of whether EPA should delay issuance of this rule because of concerns raised over PSD and Title V permitting.

The third category of comments, relating to small business impacts, is addressed in Section 5.14 of this Response to Comments document, including EPA's response to comments regarding compliance with the Regulatory Flexibility Act. As stated in that response, EPA is certifying that the rule does not have a significant impact on a substantial number of small entities after considering the impacts of the regulatory requirements contained in this final rule, on the small entities directly subject to the rule. Accordingly, EPA is able to certify this rule under the RFA because small entities are exempt from regulation under the rule. As explained in that response, this rulemaking is limited to issues involved in setting emissions standards for large motor vehicle manufacturers, and EPA would not be able to account for any potential indirect impacts from separate statutory requirements on entities not directly subject to or impacted by this rule. Accordingly, because the RFA requires the agency to look only at the "small entities to which the proposed rule will apply" and small entities "subject to the requirement" of the specific rule in question, 5 U.S.C. § 603(b), the RFA does not apply to small entities indirectly affected by the regulation of other entities.

The fourth category of comments suggested that EPA should defer setting GHG standards for new motor vehicles to avoid such stationary source permitting impacts. EPA is issuing these final GHG standards for light-duty vehicles as part of its efforts to expeditiously respond to the Supreme Court's nearly three year old ruling in Massachusetts v. EPA, 549 U.S. 497 (2007). In that case, the Court held that greenhouse gases fit within the definition of air pollutant in the Clean Air Act, and that EPA is therefore compelled to respond to the rulemaking petition under section 202(a)(1) by determining whether or not emissions from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. The Court further ruled that, in making these decisions, the EPA Administrator is required to follow the language of section 202(a)(1) of the CAA. The Court stated that under section 202(a), "[i]f EPA makes [the endangerment and cause or contribute findings], the Clean Air Act requires the agency to regulate emissions of the deleterious pollutant." 549 U.S. at 534. As discussed above, EPA has made the two findings on contribution and endangerment. 74 FR 66496 (December 15, 2009). Thus, EPA is required to issue standards applicable to emissions of this air pollutant from new motor vehicles[1].

The Court properly noted that EPA retained "significant latitude" as to the "timing ... and coordination of its regulations with those of other agencies" (id.). However, it has now been nearly three years since the Court issued its opinion, and the time for delay has passed. In the absence of these final standards, there would be three separate federal and state regimes independently regulating light-duty vehicles to increase fuel economy and reduce GHG emissions: NHTSA's CAFE standards, EPA's GHG standards, and the GHG standards applicable in California and other states adopting the California standards. This joint EPA-NHTSA program will allow automakers to meet all of these requirements with a single national fleet because California has indicated that it will accept compliance with EPA's GHG standards as compliance with California's GHG

[1] EPA consequently disagrees strongly with the view of Duke Energy and others that "EPA lacks the legal authority to issue its proposed GHG motor vehicle emission standards under section 202(a) of the CAA".

standards. 74 FR at 49460. California has not indicated that it would accept NHTSA's CAFE standards by themselves. Without EPA's vehicle GHG standards, the states will not offer the federal program as an alternative compliance option to automakers and the benefits of a harmonized national program will be lost. California and several other states have expressed strong concern that, without comparable federal vehicle GHG standards (not fuel economy standards), the states will not offer the federal program as an alternative compliance option to automakers. Letter dated February 23, 2010 from Commissioners of California, Maine, New Mexico, Oregon and Washington to Senators Harry Reid and Mitch McConnell (Docket EPA-HQ-OAR-2009-0472). The automobile industry also strongly supports issuance of these rules to allow implementation of the national program and avoid "a myriad of problems for the auto industry in terms of product planning, vehicle distribution, adverse economic impacts and, most importantly, adverse consequences for their dealers and customers." Letter dated March 17, 2010 from Alliance of Automobile Manufacturers to Senators Harry Reid and Mitch McConnell, and Representatives Nancy Pelosi and John Boehner (Docket EPA-HQ-OAR-2009-0472). Thus, without EPA's GHG standards as part of a federal harmonized program, important GHG reductions as well as benefits to the automakers and to consumers would be lost.[2] In addition, delaying the rule would impose significant burdens and uncertainty on automakers, who are already well into planning for production of MY 2012 vehicles, relying on the ability to produce a single national fleet. Delaying the issuance of this final rule would very seriously disrupt the industry's plans.

Instead of delaying the LDV rule and losing the benefits of this rule and the harmonized national program, EPA is directly addressing concerns about stationary source permitting in other actions that EPA is taking with regard to such permitting. That is the proper approach to address the issue of stationary source permitting, as compared to delaying the issuance of this rule for some undefined, indefinite time period.

Some parties have argued that EPA's issuance of this light-duty vehicle rule amounts to a denial of various administrative requests pending before EPA, in which parties have requested that EPA reconsider and stay the GHG endangerment finding published on December 15, 2009. That is not an accurate characterization of the impact of this final rule. EPA has not taken final action on these administrative requests, and issuance of this vehicle rule is not final agency action, explicitly or implicitly, on those requests. Currently, while we carefully consider the pending requests for reconsideration on endangerment, these final findings on endangerment and contribution remain in place. Thus under section 202(a) EPA is obligated to promulgate GHG motor vehicle standards, although there is no statutory deadline for issuance of the light-duty vehicle rule or other motor vehicle rules. In that context, issuance of this final light-duty vehicle rule does no more than recognize the current status of the findings -- they are final and impose a rulemaking obligation on EPA, unless and until we change them. In issuing the vehicle rule we are not making a decision on requests to reconsider or stay the endangerment finding, and are not in any way prejudicing or limiting EPA's discretion in making a final decision on these administrative requests.

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[2] As discussed elsewhere, EPA's GHG standards achieve greater overall reductions in GHGs than NHTSA's CAFE standards.

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A fifth category of comments stated that EPA had failed to give adequate notice under section 307 (d) of the Clean Air Act and the Administrative Procedure Act because EPA did not solicit comment on when to issue the vehicle rule or present information on stationary source indirect impacts. EPA in fact "recognize(d) that some small entities continue to be concerned about the potential impacts of the statutory imposition of PSD requirements" and directed commenters to address those concerns in the PSD tailoring rule. 74 FR at 49629. The number of comments received certainly indicates that commenters were aware of the issue. More to the point, EPA gave notice on all issues relevant to this rulemaking. Commenters that request consideration of the economic impacts of the PSD permitting provisions fail to recognize that any analysis of such impacts would not aid EPA in determining what GHG standards to adopt in this rulemaking. Such impacts are not related to any of the issues EPA needs to consider and decide in determining the content of the GHG standards that will apply to automobile manufacturers.

Finally, a number of state entities stated that EPA failed to comply with the Unfunded Mandates Reform Act of 1995 because the rule has the potential to affect state/local air permitting authorities because it would cause GHG emissions to become regulated under the Title V and New Source Review permitting programs. This issue is addressed in comment response 5.14.

7.2 Endangerment Finding

Organization: Arthur G. Randol
Clark, Roy
Coalition for Responsible Regulation
Competitive Enterprise Institute
Custom Lights and Iron
Ford, Jonathan
Hagen, David L.
Shaw, Donald F.
Weber, David

Comment:

Arthur G. Randol

A commenter resubmits comments and attachments previously submitted on the April 24, 2009 Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under the Clean Air Act (herein referred to as the Findings) and the associated Technical Support Document (TSD) dated April 17, 2009. The commenter notes the submitted comments and attachments include detailed references to science, data, and models used to justify comments in the Endangerment Finding which are also the basis for this proposed vehicle rule. The comments pertain to the validity of models used for the Endangerment Finding analysis, consideration of economic welfare and national energy

security consequences, implications for the National Ambient Air Quality Standards (NAAQS) regulation, and implications for energy costs. [See OAR-2009-0472-7254.1, pp.1-6, and OAR-2009-0472-7254.2, pp.1-44 for significant commentary on the Endangerment Finding]

Coalition for Responsible Regulation

CRR strongly opposes EPA's proposed Greenhouse Gas Vehicle Emission Standards Rulemaking, 74 Fed. Reg. 49454-49789 (Sept. 28, 2009) ('Proposed Vehicle Rule'), on the grounds that it presupposes a finding that GHGs, including CO2, endanger public health or welfare. EPA does so prematurely, without scientific basis, and when a separate, still-pending EPA rulemaking is currently evaluating this key scientific issue.

Notwithstanding EPA's explicit acknowledgement that the regulation of GHGs contemplated in the Proposed Vehicle Rule cannot take place until the Proposed Endangerment Finding is first finalized, EPA has nevertheless proceeded to make a *de facto* endangerment finding in its Proposed Vehicle Rule without a supporting administrative record and without adequate consideration of the underlying climate change science, data or literature. In conclusory, unsubstantiated fashion, EPA asserts: '[t]he primary greenhouse gases of concern are directly emitted by human activities ... These gases, once emitted, remain in the atmosphere for decades to centuries ... The heating effect caused by the human-induced buildup of the greenhouse gases in the atmosphere is very likely the cause of most of the observed global warming over the last 50 years. The key effects of climate change observed to date and projected to occur in the future include, but are not limited to, more frequent and intense heat waves, more severe wildfires, degraded air quality, heavier and more frequent downpours and flooding, increased drought, greater sea level rise, more intense storms, harm to water resources, continued ocean acidification, harm to agriculture, and harm to wildlife and ecosystems. 74 Fed. Reg. at 49508. *See also id* at 49630, where a number of similarly unsubstantiated statements are made.

Virtually every one of EPA's bold assertions about climate change in the Proposed Vehicle Rule are factually and/or scientifically either demonstrably incorrect or lack supporting scientific basis. Some of CRR's members, as well as other commenters, have already systematically rebutted all of EPA's assertions, with supporting scientific documentation, in the detailed Comments the Coalition submitted in EP A's Proposed Endangerment Rulemaking [OAR-2009-0472-7053.1, p.1]

Clark, Roy

The commenter asserts the emission of greenhouse gases from motor vehicles does not pose any threat to the Earth's climate. The commenter indicates: "In spite of everything that has been published about CO_2 induced global warming and the effects of related greenhouse gases, no quantitative relationship between climate change and atmospheric CO_2 concentration has ever been demonstrated because none exists. The entire global warming case is based on the empirical speculation that the observed 100 ppm

anthropogenic increase in atmospheric CO_2 concentration over the last 200 years has produced an 'average' increase of 1 degree Celsius in the meteorological surface air temperature."

The commenter asserts that this is flagrant scientific fraud based on deliberate distortions of the historical temperature record and invalid computer simulation by an elite group of climate 'scientists' which has been made abundantly clear by the recent availability of long requested documents from the UK Hadley Climate Center. [OAR-2009-0472-7179.1, p. 1]

Shaw, Donald F.

A commenter asserts the globe has not warmed for the last 11 years and recent peer-reviewed papers have indicated that the latest IPCC report (2007) exaggerates the temperature rise by using large positive feedback factors. The feedback factors are not scientifically determined and some noted scientists claim that they are actually negative. The commenter indicates that some scientists have recently indicated that the effects of methane and aerosols have been underestimated and that the impact of CO_2 on warming may be only half that previously believed and the IPCC report erroneously dismisses natural variations as well as methane and other gasses as being significant. [OAR-2009-0472-7270, pp. 1-2]

Custom Lights and Iron

Another commenter indicates that the climate change science is weak at best and it is necessary to wait for better data. The commenter indicates there has been no proof of warming since 1997 based on observational data despite increasing CO_2 in the atmosphere. [OAR-2009-0472-7110, p.1]

Hagen, David L.

A commenter notes the EPA's Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act are critically flawed by ignoring:

- The global oil production rates and the necessity of rapidly finding alternatives to replace rapid declines in existing oil production.
- The costs and rate limitations to providing alternative fuels.
- The investment required to develop alternative fuels.
- The Principles of Scientific Forecasting.
- The Hurst-Kolgomorov parameters of natural climate change.

The commenter also asserts the EPA is relies on politically-biased science by relying only on the IPCC which has a political mandate to find evidence for anthropogenic climate change. The commenter also indicates the EPA reliance on IPCC models is fatally flawed by ignoring the major impact of solar/climate correlations, and overestimating the influence of CO2. [OAR-2009-0472-7218.1, p.2]

Competitive Enterprise Institute

The proposed standards are authorized only if EPA determines that "air pollution" related to GHG emissions from new motor vehicles "may reasonably be anticipated to endanger public health or welfare." However, as explained in my comment on EPA's endangerment proposal, EPA has not exercised its judgment with regard to the fundamental scientific issues – detection, attribution, and sensitivity – deferring instead to literature reviews produced by external authorities. Moreover, the core scientific issues are more "unsettled" today than at any time in the past decade. For example, MIT Professor Richard Lindzen's recent satellite study of top-of-the-atmosphere radiative flux indicates that climate sensitivity is six times lower than the mid-range estimate of the Intergovernmental Panel on Climate Change (IPCC). [OAR-2009-0472-7281.1, p.9]

Ford, Jonathan

The commenter asserts that CO2 is not a pollutant. [OAR-2009-0472-7674]

Weber, David

I have not seen convincing scientific evidence that CO2 causes global warming and I have not seen any evidence that global warming will be bad for the environment or that global warming is a health issue. The EPA paper saying that GHG's are a health and safety risk is incorrect and it is not backed up with any data. I have seen on-line reports as evidence that the recent warming of the last 100 years (compared to the last 2000 years of direct or indirect measurements) is a normal fluctuation from natural forces and that it is unrelated to CO2 in the atmosphere.

But, even if GHG's do increase temperature, my opinion is that the world would be greener if the average temperature was higher. A warmer earth would increase the temperature of the world's oceans. The higher temperature will cause higher rainfall. Plants grow best with higher rainfall, higher temperature and higher CO2 concentration. So, the area of usable agricultural land (i.e. non-desert land and non-permafrost land) will increase if we have more GHG's and higher temperatures.

The Supreme Court [Massachusetts v. EPA] ruled that the EPA may regulate CO2, only if, they determine that CO2 is a GHG and that GHG's are a health risk. They have not done so for either postulate. So, this EPA regulation is not constitutional. [OAR-2009-0472-1410]

EPA Response:

This rulemaking is on the issues relevant to issuing emissions standards for new motor vehicles under Section 202(a) of the Clean Air Act. The comments are not relevant to the issues and decisions before the Agency in this standard setting rulemaking, as they relate to the separate rulemaking on the endangerment and contribution findings.

EPA has made a decision on the endangerment and contribution findings, with final Findings published in the Federal Register on December 15, 2009 (74 FR 66496). Comments in that rulemaking were carefully reviewed and considered in that rulemaking and addressed in the associated Response to Comments document, available at: http://www.epa.gov/climatechange/endangerment.html. EPA is not responding to them here as they are not relevant to this rulemaking.

EPA refers commenters to the Response to Comments Document associated with the endangerment findings, available at http://www.epa.gov/climatechange/endangerment.html, for numerous detailed responses to comments, including the following topics:

- attribution of observed climate change to anthropogenic emissions of greenhouse gases (Volume 3)
- validity of observations and data used by EPA to determine trends in increasing global mean temperatures (Volume 2)
- discussion of the use of IPCC, USGCRP, and NRC reports as the primary scientific basis for the Findings, and response to claims that IPCC is a politically biased organization (Volume 1)

Finally, EPA refers the commenter to the Findings, TSD, and Response to Comments document for detailed discussion of the multiple lines of evidence that the climate system is warming and that most of that warming over the last 50 years is very likely due to human emissions of GHGs.

Organization: Arthur G. Randol
Clark, Roy
Coalition for Responsible Regulation (Holland & Hart)
Congress of Racial Equality
Ford, Jonathan
Hagen, David L.
Shaw, Donald F.
Spurgeon, C. M.
Wood, John S.

Comment:

A few commenters refer to the computer files released from the Climate Research Unit (CRU) at the East Anglia University, UK and indicate it seriously questions the veracity of the temperature data that has been widely used in the IPCC and other reports. The commenter indicates that according to news reports the released files and e-mails revealed that the leading scientists from the US and UK (that provide key temperature data to the IPCC) have apparently fudged the data to exaggerate warming and suppress temperature declines using "tricks" and cherry-picked data. The commenter also asserts there is evidence that the peer review process has been corrupted and technical papers suppressed that question the reported plots and temperatures. Another commenter

indicates the recently released CRU e-mails show scientists refusing to release the data and models for independent scientific review.

A commenter indicates: "Due to the recent release of the e-mails and data from "Climatic Research Institute at the University of East Anglia" (which has excessive influence over the IPCC), this proposed rulemaking as well as any other actions related to Greenhouse Gas Emission Standards must be postponed until an independent audit of any climate temperature increase due to CO2 has been scientifically verified and all data for this determination has been made public, along with the questionable computer model used." Commenters request that the EPA suspend any actions pending the outcome of all investigations. One commenter indicates "[i]n light of recent developments within the scientific community on climate data and manipulation of the peer-review process, EPA should hold off on any further proposed rulemaking regarding any GHG's until a formal and full investigation is completed."

EPA Response:

This rulemaking is on the issues relevant to issuing emissions standards for new motor vehicles under Section 202(a) of the Clean Air Act. The comments are not relevant to the issues and decisions before the Agency in this standard setting rulemaking, as they relate to the separate rulemaking on the endangerment and contribution findings.

EPA has made a decision on the endangerment and contribution findings, with final Findings published in the Federal Register on December 15, 2009 (74 FR 66496). Comments in that rulemaking were carefully reviewed and considered in that rulemaking and addressed in the associated Response to Comments document, available at: http://www.epa.gov/climatechange/endangerment.html. EPA is not responding to them here as they are not relevant to this rulemaking.

EPA addressed comments on the recently disclosed CRU e-mails in Volume 11 of the Response to Comments document associated with the final Findings, which is available at http://www.epa.gov/climatechange/endangerment.html. In addition, EPA has received multiple administrative petitions for reconsideration of the Findings, which raise issues related to the released CRU emails. Responses are under development and will be made public when completed. Also see the response to the following comment.

Organization: Coalition for Responsible Regulation (Holland & Hart)

Comment:

The commenter opposes EPA's Proposed Vehicle Rule on the grounds that it presupposes a finding that GHGs endanger public health and welfare and EPA does so prematurely, without scientific basis, and when a separate, still pending EPA rulemaking is currently evaluating this key scientific issue. The commenter urges the EPA Administrator not to finalize the proposed Vehicle Rule until EPA's Proposed Endangerment Finding has been rejected or supported by sound and comprehensive scientific evidence; and until

whatever ensuing Petitions for Reconsideration or Petitions for Review regarding the Proposed Endangerment Finding have been finally mid fully resolved. The commenter asserts that proceeding with the Proposed Vehicle Rule prior to finalization and judicial review of the Proposed Endangerment Finding would violate EPA's statutory charge, as reinforced by the Supreme Court in *Massachusetts v. EPA*, 549 U.S. at 533, to first make a finding of GHG endangerment, only after which EPA may prescribe regulations and promulgate standards to control GHG emissions. [OAR-2009-0472-7053.1, p.4]

EPA Response:

EPA has made a decision on the endangerment and contribution findings, with final Findings published in the Federal Register on December 15, 2009 (74 FR 66496). This rulemaking is on the issues relevant to issuing emissions standards for new motor vehicles under Section 202(a) of the Clean Air Act. The comments are not relevant to the issues and decisions before the Agency in this standard setting rulemaking, as they relate to the separate rulemaking on the endangerment and contribution findings.

EPA has made a decision on the endangerment and contribution findings, with final Findings published in the Federal Register on December 15, 2009 (74 FR 66496). EPA notes that these comments, references, and attachments previously submitted by the commenter were carefully reviewed and fully addressed in the Final Findings published in the Federal Register on December 15, 2009 (74 FR 66496) and associated Response to Comments document, available at:
http://www.epa.gov/climatechange/endangerment.html EPA is not responding to them here as they are not relevant to this rulemaking.

EPA is issuing these final GHG standards for light-duty vehicles as part of its efforts to expeditiously respond to the Supreme Court's nearly three-year-old ruling in Massachusetts v. EPA, 549 U.S. 497 (2007). In that case, the Court held that GHGs fit within the definition of air pollutant under in the Clean Air Act, and that EPA is therefore compelled to respond to the rulemaking petition under section 202(a) by determining whether or not emissions from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare , or whether the science is too uncertain to make a reasoned decision. The Court further ruled that, in making these decisions, the EPA Administrator is required to follow the language of section 202(a) of the CAA. The Court stated that under section 202(a), "[i]f EPA makes [the endangerment and cause or contribute findings], the Clean Air Act requires the agency to regulate emissions of the deleterious pollutant." 549 U.S. at 534. As discussed above, EPA has made the two findings on contribution and endangerment. 74 FR 66496 (December 15, 2009). Thus, EPA is required to issue standards applicable to emissions of this air pollutant from of new motor vehicles.

The Court properly noted that EPA retained "significant latitude" as to the "timing ... and coordination of its regulations with those of other agencies" (id.). However it has now been nearly three years since the Court issued its opinion, and the time for delay has passed. In the absence of these final standards, there would be three separate federal and

state regimes independently regulating light-duty vehicles to increase fuel economy and reduce GHG emissions: NHTSA's CAFE standards, EPA's GHG standards, and the GHG standards applicable in California and other states adopting the California standards. This joint EPA-NHTSA program will allow automakers to meet all of these requirements with a single national fleet because California has indicated that it will accept compliance with EPA's GHG standards as compliance with California's GHG standards. 74 FR at 49460. NHTSA's CAFE standards by themselves would not lead to this result. Without EPA's vehicle GHG standards, the states will not be able to offer the federal program as an alternative compliance option to automakers and the benefits of a harmonized national program will be lost. California and several other states have expressed strong concern that, without comparable federal vehicle GHG standards, the states will not be able to offer the federal program as an alternative compliance option to automakers. Letter dated February 23, 2010 from Commissioners of California, Maine, New Mexico, Oregon and Washington to Senators Harry Reid and Mitch McConnell (Docket EPA-HQ-OAR-2009-0472). The automobile industry also strongly supports issuance of these rules to allow implementation of the national program and avoid "a myriad of problems for the auto industry in terms of product planning, vehicle distribution, adverse economic impacts and, most importantly, adverse consequences for their dealers and customers." Letter dated March 17, 2010 from Alliance of Automobile Manufacturers to Senators Harry Reid and Mitch McConnell, and Representatives Nancy Pelosi and John Boehner (Docket EPA-HQ-OAR-2009-0472). Thus, without EPA's GHG standards as part of a federal harmonized program, important GHG reductions as well as benefits to the automakers and to consumers would be lost.[3] In addition, delaying the rule would impose significant burdens and uncertainty on automakers, who are already well into planning for production of MY 2012 vehicles, relying on the ability to produce a single national fleet. Delaying the issuance of this final rule would very seriously disrupt the industry's plans

Instead of delaying the light-duty vehicle rule and losing the benefits of this rule and the harmonized national program, EPA is directly addressing concerns about stationary source permitting in other actions that EPA is taking with regard to such permitting. That is the proper approach to address the issue of stationary source permitting, as compared to delaying the issuance of this rule for some undefined, indefinite time period.

Some parties have argued that EPA's issuance of this light-duty vehicle rule amounts to a denial of various administrative requests pending before EPA, in which parties have requested that EPA reconsider and stay the GHG endangerment finding published on December 15, 2009. That is not an accurate characterization of the impact of this final rule. EPA has not taken final action on these administrative requests, and issuance of this vehicle rule is not final agency action, explicitly or implicitly, on those requests. Currently, while we carefully consider the pending requests for reconsideration on endangerment, these final findings on endangerment and contribution remain in place. Thus under section 202(a) EPA is obligated to promulgate GHG motor vehicle standards, although there is no statutory deadline for issuance of the light-duty vehicle rule or other

[3] As discussed elsewhere, for a variety of reasons EPA's GHG standards achieve greater overall reductions in GHGs than NHTSA's CAFE standards.

motor vehicle rules. In that context, issuance of this final light-duty vehicle rule does no more than recognize the current status of the findings -- they are final and impose a rulemaking obligation on EPA, unless and until we change them. In issuing the vehicle rule we are not making a decision on requests to reconsider or stay the endangerment finding, and are not in any way prejudicing or limiting EPA's discretion in making a final decision on these administrative requests.

Organization: Consumers Energy

Comment:

The Joint Motor Vehicle Proposal contains a number of significant flaws and shortcomings that necessitate withdrawal of EPA's portion of the proposed rule. EPA's analysis demonstrates that it cannot properly reach an affirmative endangerment finding given the inability of the emission standards to avert or to attack fruitfully the source of GHG-related endangerment. Because an affirmative endangerment finding in this context cannot be legally made, EPA lacks the authority to finalize its proposed GHG motor vehicle emission standards under section 202(a) of the CAA. In addition, the analyses of economic and environmental costs and benefits of the Joint Motor Vehicle Proposal are wholly insufficient and cannot support EPA's proposed standards. [OAR-2009-0472-7264.1, p.2]

Unlike NHTSA, EPA is under no statutory deadline to promulgate the standards that it is now considering. It has the time and the obligation to analyze more fully its regulatory proposal and the wide-ranging impacts that it anticipates will likely be incurred after its finalization. Finally, EPA has failed even to consider possible ways in which it might avoid prematurely imposing significant regulatory burdens, like PSD and Title V requirements, on stationary sources while pursuing mobile source regulation under section 202(a). These are matters of the utmost significance, and EPA cannot simply ignore them consistent with its obligations under the CAA. For all of the foregoing reasons, Consumers Energy agrees with UARG and requests that EPA withdraw its portion of the Joint Motor Vehicle Proposal, that NHTSA revise its regulations as may be appropriate to address this change, and that EPA engage in a new, more thoroughly reasoned regulatory decision-making process while providing adequate public notice and opportunity for comment on these important issues. [OAR-2009-0472-7264.1, p.2]

EPA Response:

This rulemaking is on the issues relevant to issuing emissions standards for new motor vehicles under Section 202(a) of the Clean Air Act. The comments are not relevant to the issues and decisions before the Agency in this standard setting rulemaking, as they relate to the separate rulemaking on the endangerment and contribution findings and to other pending actions before EPA. See the responses above for further discussion of EPA's reasons for issuing this vehicle rule at this time. In addition, the comment provides no details on their objections to EPA's analyses of environmental and economic impacts.

EPA has made a decision on the endangerment and contribution findings, with final Findings published in the Federal Register on December 15, 2009 (74 FR 66496). Comments in that rulemaking were carefully reviewed and considered in that rulemaking and addressed in the associated Response to Comments document, available at: http://www.epa.gov/climatechange/endangerment.html. EPA is not responding to them here as they are not relevant to this rulemaking.

Organization: Duke Energy

Comment:

Duke Energy Business Services LLC ("Duke Energy"), on behalf of Duke Energy Carolinas, LLC, Duke Energy Indiana, Inc., Duke Energy Ohio, Inc., Duke Energy Kentucky, Inc., and Duke Energy Generation Services ("DEGS"), therefore submits the following comments on the Joint Motor Vehicle Proposal. Specifically, the significant flaws and shortcomings of the Joint Motor Vehicle Proposal necessitate the withdrawal of EPA's portion of the proposed rule. Duke Energy continues to support the enactment of environmentally and economically sustainable federal climate change legislation. Regulating GHGs under the CAA is the wrong approach. [OAR-2009-0472-7136.1, p.2]

The U.S. Environmental Protection Agency's ("EPA") has stated its view that promulgation of the GHG motor vehicle standards will subject GHGs to the CAA Prevention of Significant Deterioration ("PSD") program and the permitting requirements of Title V of the CAA, potentially as soon as the date on which the rule becomes final and effective. Duke Energy believes, however, that EPA's legal positions in this regard and the analysis presented in the proposed rule are seriously flawed and must be corrected. [OAR-2009-0472-7136.1, p.2]

The Joint Motor Vehicle Proposal and its supporting documentation makes clear that EPA's proposed GHG motor vehicle emission standards are largely duplicative of NHTSA's proposed program and that EPA's proposal will not add in any significant manner to the GHG reductions and associated impacts of NHTSA's proposed CAFE standards. Therefore, EPA cannot properly reach an affirmative endangerment finding to satisfy the requirements of the CAA's test for finding "endangerment," rendering EPA's proposed GHG motor vehicle emission [OAR-2009-0472-7136.1, p.2] standards legally (and scientifically) unjustified. Because an affirmative endangerment finding cannot be legally made, EPA lacks the authority to finalize its proposed GHG motor vehicle standards under section 202(a) of the CAA. [OAR-2009-0472-7136.1, p.3]

EPA Response:

This rulemaking is on the issues relevant to issuing emissions standards for new motor vehicles under Section 202(a) of the Clean Air Act. The comments are not relevant to the issues and decisions before the Agency in this standard setting rulemaking, as they relate to the separate rulemaking on the endangerment and contribution findings.

EPA has made a decision on the endangerment and contribution findings, with final Findings published in the Federal Register on December 15, 2009 (74 FR 66496). Comments in that rulemaking were carefully reviewed and considered in that rulemaking and addressed in the associated Response to Comments document, available at: http://www.epa.gov/climatechange/endangerment.html. EPA addressed comments in that rulemaking claiming that EPA could not make an endangerment finding because of the relationship of EPA's GHG standards to NHTSA's CAFE standards. See 74 FR 66496, 66507-508 (December 15, 2009). EPA is not responding to them here as they are not relevant to this rulemaking.

Organization: Texas Commission on Environmental Quality

Comment:

In providing these comments, the TCEQ emphasizes that it does not support EPA's actions to regulate GHG under the federal Clean Air Act (CAA). As stated in TCEQ comments dated June 23, 2009, to EPA's Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases, the CAA is not an appropriate vehicle for the regulation of GHG, and the proposed endangerment finding, if finalized, would likely force EPA to begin regulating other sources through other major CAA programs resulting in significant impacts to the economy of Texas and thus, the nation, without measurable environmental benefits. TCEQ recommends that EPA not finalize the GHG emission standards for light-duty vehicles under the proposed rule. [OAR-2009-0472-7180.1, p.1]

EPA Response:

This rulemaking is on the issues relevant to issuing emissions standards for new motor vehicles under Section 202(a) of the Clean Air Act. The comments are not relevant to the issues and decisions before the Agency in this standard setting rulemaking, as they relate to the separate rulemaking on the endangerment and contribution findings or on other pending or potential rulemakings.

EPA has made a decision on the endangerment and contribution findings, with final Findings published in the Federal Register on December 15, 2009 (74 FR 66496). Comments in that rulemaking were carefully reviewed and considered in that rulemaking and addressed in the associated Response to Comments document, available at: http://www.epa.gov/climatechange/endangerment.html. EPA is not responding to them here as they are not relevant to this rulemaking. See responses to comments above concerning EPA's reasons for issuing the light-duty vehicle rule now instead of delaying issuance of the rule.

Organization: Georgia-Pacific (GP)

Comment:

Since the carbon-neutral motor vehicle emissions of CO2 from biofuels do not contribute to the increase in atmospheric CO2 concentrations which constitute the public

endangerment in EPA's view, EPA lacks a statutory basis for restricting motor vehicle CO2 emissions to the extent that they result from use of biofuels.
[See Docket Number OAR-2009-0472-7122.1, pp.6-9 for detailed comments pertaining to: Biofuel Combustion Is Carbon-Neutral and EPA Must Account for the CO2-Neutrality of Biofuels To Be Consistent With Its Endangerment Finding]

EPA Response:

EPA's authority to adopt emissions standards under section 202(a)(1) is not limited to motor vehicles powered by fuels other than biofuels. Vehicles operating on biofuels do emit GHGs, and as discussed in the preamble, from a lifecycle perspective biofuels such as ethanol are not carbon neutral in the sense the commenter uses.

This is also fully consistent with the endangerment and contribution findings. EPA included all motor vehicles emissions in calculating emissions for purposes of the contribution finding, and did not exclude emissions from vehicles operated by biofuels. In addition, the content or form of the emissions control to follow under section 202(a)(1) was not relevant to the determination that the air pollution of atmospheric concentrations of GHGs endanger public health and welfare. See also Section 5.7.2 of this Response to Comments document.

7.3 Vehicle Life-Cycle Emissions Issues

EPA's proposed GHG emissions standards are tailpipe-based standards, consistent with other EPA vehicle emissions standards. Although EPA did not ask for comment on this issue, we did receive four comments from organizations recommending that EPA not only account for vehicle tailpipe GHG emissions, but also GHG emissions associated with other steps of the vehicle life-cycle. The structure of this section is to provide a sampling of excerpts of these four comments, followed by an EPA response.

Organization: American Iron and Steel Institute
University of Pennsylvania, Environmental Law Project
US Steel Corporation
Washington State Department of Commerce

Comment:

American Iron and Steel Institute

Clearly, the regulation's purpose is to reduce the energy consumption and greenhouse gas emissions (mainly CO2) associated with the combustion of fuel during the driving cycle of light-duty vehicles for the U.S. fleet. AISI is concerned that focusing only on the driving-phase of a vehicle's life will lead to increased energy consumption and CO2 emissions while reducing vehicle affordability. This is because technology selections will be made to lower driving phase energy use and GHG emissions that will increase energy use and GHG emissions in other phases of vehicle life, more than offsetting the driving

phase reductions. A methodology based on Life Cycle Assessment [LCA] of the vehicle [considering all phases of a vehicle's life as opposed to only the driving phase] will ensure energy reduction and GHG reductions occur. [OAR-2009-0472-7088.1, p.2]

1. Life Cycle Assessment (LCA): In order to ensure the steps taken by automakers to comply with the proposed rule result in lower energy use and GHG emissions, it is critically important that energy use and GHG emissions over the full life cycle of the vehicle are considered. Clearly, the reduction in fuel consumption per mile over the driving phase, as the proposed rule stipulates, will directly reduce energy use and GHG emissions for the driving phase of the vehicle's life. However, by ignoring the consequences of the likely steps automakers may use to comply with a driving phase-only rule [such as mass reduction through materials substitution] higher energy use and GHG emissions will result. [OAR-2009-0472-7088.1, p.3]

The proposed rule already considers an expanded view [beyond driving phase emissions] by encouraging the use of air conditioning refrigerants with low global warming potential. AISI recommends the proposed rule include energy use and GHG emissions attributable to vehicle materials and their manufacturing phase. A methodology is described below. [OAR-2009-0472-7088.1, p.3]

An article (Attachment 1) published by American Metal Market in May 2008 by Dr. Roland Geyer of the University of California-Santa Barbara, thoughtfully explains, in general, the concerns about regulations and unintended consequences. He includes examples of an overenthusiastic approach to the regulation of a single phase of a life cycle, while ignoring the full life cycle of the process or product regulated. A diagram showing energy consumption and GHG emissions during the life cycle of a vehicle is shown in Figure 2. The LCA approach is detailed in ISO Standard 14040 Series. Geyer has produced a methodology, endorsed by ISO peer review, through which energy use and CO2 emissions resulting from the selection of materials for vehicles can be evaluated for the entire life cycle of the vehicle. AISI recommends that materials selection for vehicles be evaluated by a model [such as the Geyer model] that considers life-cycle impact on energy use and GHG emissions. Similar studies and public statements about this approach have been made by automakers. For example, recently published information from Mercedes in its S-Class Environmental Certificate (Attachment 2) shows how car makers are using LCA in materials decisions. [OAR-2009-0472-7088.1, p.3] [[Attachment 1 is Docket Number OAR-2009-0472-7088.2 which is copyrighted material and not available on FDMS. Attachment 2 is Docket Number OAR-2009-0472-7088.3.]]

EPA and NHTSA should promulgate regulations that require manufacturers to meet regulations by the lowest life cycle emissions solution, for example by selecting comparatively low energy and low C02 materials like high-strength steel. Materials that lower the overall life-cycle energy use and GHG emissions of the vehicle should be preferred to those that consume more energy and raise the total GHG burden. [OAR-2009-0472-7088.1, p.6]

Methodologies for conducting life cycles assessment of vehicles are well established through exiting tools such as ISO Standard 14040 Series. Vehicle manufacturers already have the in-house capability of conducting LCA for materials selection and there are many published examples where these studies have been applied. Many materials suppliers have established materials energy and CO2 emissions databases. The tools for implementing a life cycle assessment guideline for materials selection are already established and in use by some manufacturers (Attachment 2). [OAR-2009-0472-7088.1, p.6]

AISI strongly recommends the proposed rule incorporate the energy and emissions associated with creating the materials used in building the vehicle and the energy and emissions saved at end of life through recycling. In this way, the reduction in emissions during the driving cycle will not be offset by increases in energy use and GHG emissions associated with use of energy- and GHG intensive materials and the lowest total impact on the environment will be achieved. [OAR-2009-0472-7088.1, p.6]

AISI supports a national standard that can be uniformly applied in order to reduce the consumption of fuel and the emissions associated with light vehicles. However, the current proposal to regulate based only the vehicle driving phase may very well increase energy use and GHG emissions while increasing vehicle cost. Increased vehicle cost would further delay the adoption of compliant vehicles, slowing the reduction in emissions. [OAR-2009-0472-7088.1, p.8]

To avoid these outcomes, we strongly recommend EPA and NHTSA incorporate all life cycle energy use and GHG emissions associated with light-duty vehicles into this rule. A life cycle approach is more consistent with achieving the objectives of the Clean Air Act, the Energy Independence and Security Act (EISA) of 2007, and President Obama's October 5,2009 Executive Order on Federal Leadership in Environmental, Energy, and Economic Performance. [OAR-2009-0472-7088.1, p.9]

University of Pennsylvania, Environmental Law Project

Significantly, the EPA/DOT joint proposed rulemaking also fails to take into account a few potentially major factors because it fails to do a complete life cycle impact assessment. Thus, while the rule would achieve the admirable goal of reducing source emissions of GHGs from motor vehicles in operation, the rule could potentially *increase* overall global GHG emissions. [OAR-2009-0472-7286.1, p. 19]

Automobile manufacturers (and their parts suppliers) may need to build more advanced facilities or convert existing facilities in order to produce the more advanced vehicles that will be required by the proposed rule. This building process will require the extraction and processing of raw and recycled materials into useable building materials, transportation of those building materials to the site of existing or new facilities, and construction. Each of these steps in the renovation or new construction process will be a source of new GHG emissions attributable to the proposed rule. [OAR-2009-0472-7286.1, p. 19]

Aside from the actual physical buildings where parts are manufactured or motor vehicles assembled, the tools required for manufacturing and assembly are likely to become more complex and energy intensive. The manufacture and use of these new tools will require additional GHG outputs. Moreover, vehicles will likely be manufactured of lighter-weight materials in order to meet higher fuel economy requirements; some of these materials may be more energy intensive to produce or recycle, leading to increased GHG emissions in those processes at least indirectly attributable to the proposed rule. [OAR-2009-0472-7286.1, p. 20]

Finally, consumers will be resistant to purchasing new vehicles because of the increased up-front cost, even with a net savings due to reduction in fuel costs, because they may not take the net savings into account or may not value those savings as highly as an upfront cost savings. In any case, in order to reduce up-front costs to consumers of new vehicles, manufacturers (and their suppliers) may increase the proportion of vehicle parts produced and motor vehicles assembled in countries with cheaper labor. Notwithstanding the likely impact on the domestic job market, this will also create a greater need to transport such parts to assembly plants and assembled vehicles to their points-of-sale. This will also result in increased GHG emissions attributable to the proposed rule. [OAR-2009-0472-7286.1, p. 20]

Importantly, this report does not claim to be able to predict the increase in GHG emissions that will be associated with the manufacturing and transportation of the more advanced vehicles that the EPA/DOT joint rule will necessitate. Instead, it aims only to point out that such a complete life cycle analysis should be performed in order to assess the net effect the rule will have on GHG emissions. [OAR-2009-0472-7286.1, p. 20]

US Steel Corporation

Life Cycle Assessment (LCA): It is important to consider the impact of compliance to the proposed aggressive fuel economy regulations on energy and CO2 emissions over the full life cycle of the vehicle. Clearly, the reduction in fuel consumption per mile over the driving phase, as the proposed NPRM would stipulate, will directly reduce energy use and CO2 emissions for the use-phase of the vehicle's life. However, by ignoring the consequences of those probable technologies (one of which is mass reduction through materials selection) to be used by car companies to achieve these results, it is possible for higher-energy and CO2-intensive manufacturing of low density materials to offset the benefit of the regulations imposed on the driving phase alone. [OAR-2009-0472-7197.1, p.3 full discussion follows in document]

[[These comments were submitted as testimony at the Detroit public hearing. See docket number OAR-2009-0472-6185, pp. 102-103.]]

The methodology for a life cycle approach as well as establish an ISO standard 1440, many vehicle manufacturers are already implementing this methodology in vehicle designs. The concern is vehicle makers may select technologies that increase the full life

cycle energy and CO2 footprint of the vehicle in order to comply with the tailpipe-only regulations.

We will continue to invest in steel technologies that reduce the full life cycle energy and the CO2 footprint of the vehicle. Since the 1990s the North American Steel Industry has reduced the energy and carbon intensity of steel by 33 percent, more than doubling the target set by the protocol. Looking to the future, the steel industry is exploring over 100 independent CO technologies to reduce or eliminate carbon emissions associated with steel making. We continue to develop new grades of steel both independently and in partnership with the National Science Foundation and universities that will enable additional lightweighting. And at the end-of-life steel will continue to be the most recycled material on the planet, more than all other materials combined.

The combinations of these investments will reduce the energy and CO2 intensity of the steel supply, reduce the amount of steel needed per vehicle, reduce the tailpipe emissions through weight reduction, and reduce the emissions at the end-of-life through recycling.

However, without the appropriate regulations, these opportunities to reduce the energy use and CO2 emissions associated with a vehicle may not be realized.

The current fuel economy and tailpipe emissions regulations may result in the unintended consequences of increasing the full life cycle energy used and CO2 emissions of the vehicle.

It is my recommendation and request on behalf of U.S. Steel that the EPA and NHTSA develop policies that comprehend the full life cycle environmental impact associated with the vehicle and encourages vehicle manufacturers to choose technologies that result in the lowest environmental impact on the entire vehicle's life.

Washington State Department of Commerce

[Following comments are from LA Testimony, OAR-2009-0472-7283, pp.123-124]

EPA is structuring their regulation -- standards, cost-benefit analysis, et cetera -- on the basis of GHG emitted directly from the vehicle. We urge EPA to explore the areas in the regulation where the use of life-cycle GHG emission would not be prevented by statute.

We believe a life-cycle approach would be particularly important and helpful to provide the right incentives, A, to different vehicle technologies at a given point in time; and, B, to a given vehicle technology over time.

EPA Response:

EPA's final GHG emissions standards are vehicle tailpipe-based standards. The four commenters all suggested that EPA consider accounting for GHG emissions associated with other steps of the vehicle life-cycle. The American Iron and Steel Institute and US

Steel Corporation primarily focus on the GHG emissions impacts associated with producing the materials used in vehicle and component assembly and in materials end-of-life considerations (i.e., recycling or disposal). The University of Pennsylvania, Environmental Law Project goes further and suggests that EPA should consider the GHG emissions impacts of building and operating new, more advanced assembly facilities and tooling, and even the potential GHG emissions impacts that might be associated with a greater reliance on imported vehicles and components, on the theory that technologies with a higher up-front cost might be more likely to be produced in countries with lower labor costs. Each of these three commenters makes the point that these non-tailpipe GHG emissions considerations could reduce the effective GHG savings of the program. The University of Pennsylvania, Environmental Law Project suggests that the non-tailpipe GHG emissions impacts "could potentially *increase* overall global GHG emissions."

EPA understands the technical issues associated with life-cycle analysis. But, vehicle life-cycle GHG emissions impacts are beyond the scope of this rulemaking. EPA has wide discretion under section 202(a) and has chosen to first focus on vehicle tailpipe GHG emissions, both because tailpipe emissions are the largest single source of vehicle life-cycle GHG emissions, and because the EPA motor vehicle program has traditionally focused on tailpipe emissions. The time involved in developing a methodology and the necessary data, noticing all of the information and assessing the public comments would significantly delay issuing GHG standards in time for MY 2012 and perhaps later model years as well, undermining any potential benefits of the approach. In addition, extending the vehicle tailpipe GHG emissions standards to include other steps of the vehicle life-cycle would reduce the harmonization with NHTSA's CAFE program, and EPA has reasonably considered such harmonization to be appropriate in this rulemaking.

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Message

From: French, Roberts [french.roberts@epa.gov]
Sent: 3/2/2020 7:18:10 PM
To: Bunker, Byron [bunker.byron@epa.gov]; Zaremski, Sara [zaremski.sara@epa.gov]
Subject: Trends Executive Summary
Attachments: 420s20001.pdf

Roberts W. French, Jr.
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The 2019 EPA Automotive Trends Report

Greenhouse Gas Emissions, Fuel Economy, and Technology since 1975

MPG
CO_2

Executive Summary

United States Environmental Protection Agency
EPA-420-S-20-001 March 2020

ED_006488A_00002355-00001

Executive Summary

This annual report is part of the U.S. Environmental Protection Agency's (EPA) commitment to provide the public with information about new light-duty vehicle greenhouse gas (GHG) emissions, fuel economy, technology data, and auto manufacturers' performance in meeting the agency's GHG emissions standards.

EPA has collected data on every new light-duty vehicle model sold in the United States since 1975, either from testing performed by EPA at the National Vehicle and Fuel Emissions Laboratory in Ann Arbor, Michigan, or directly from manufacturers using official EPA test procedures. These data are collected to support several important national programs, including EPA criteria pollutant and GHG standards, the U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA) Corporate Average Fuel Economy (CAFE) standards, and vehicle Fuel Economy and Environment labels. This expansive data set allows EPA to provide a uniquely comprehensive analysis of the automotive industry over the last 40 plus years.

All data in this report for model years 1975 through 2018 are **final** and based on official data submitted to EPA and NHTSA as part of the regulatory process. In some cases, this report will show data for model year 2019, which are **preliminary** and based on data provided to EPA by automakers prior to the model year. Preliminary data is not shown for manufacturer compliance. The report does not examine future model years, and past performance does not necessarily predict future industry trends.

The carbon dioxide (CO_2) emissions and fuel economy data in this report fall into one of two categories. The first is **compliance** data, which is measured using laboratory tests required by law for CAFE and adopted by EPA for GHG compliance. The second is **estimated real-world** data, which is measured using additional laboratory tests to capture a wider range of operating conditions (including hot/cold weather and higher acceleration) that an average driver will encounter. This report will show estimated real-world data except for the discussion specific to the GHG regulations around Figures ES-6 through ES-8 and in Section 5.

The content in this report was previously published in two separate reports, the *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends Report*, and the *GHG Manufacturer Performance Report*. These reports were combined, starting with the 2018 report, to provide a more comprehensive analysis.

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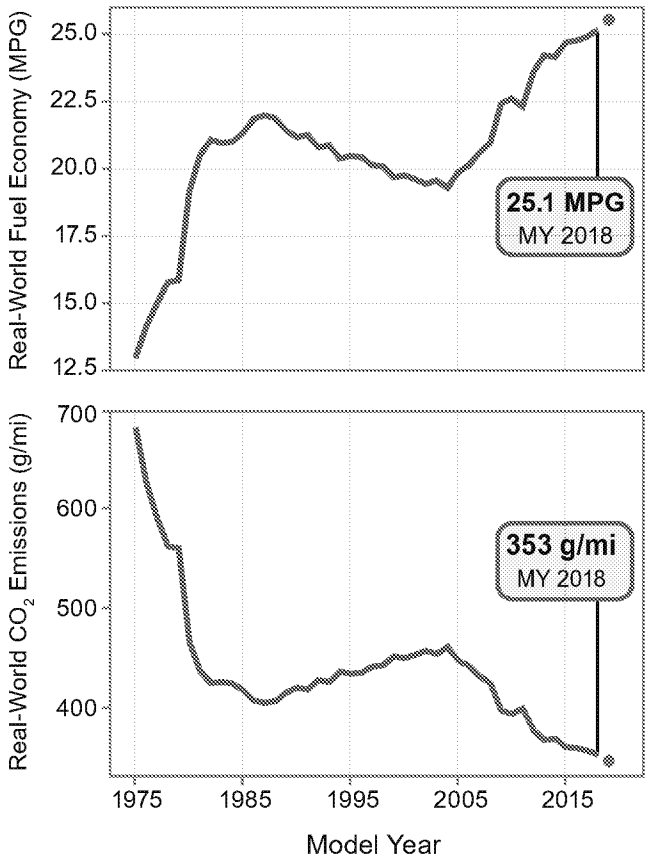
New vehicle estimated real-world CO_2 emissions are at a record low and fuel economy is at a record high

In model year 2018, the average estimated real-world CO_2 emission rate for all new vehicles fell by 4 grams per mile (g/mi) to 353 g/mi, the lowest level ever measured. Fuel economy increased by 0.2 miles per gallon to 25.1 mpg, achieving a record high.

Since 2004, CO_2 emissions have decreased 23%, or 108 g/mi, and fuel economy has increased 30%, or 5.8 mpg. Over that time, CO_2 emissions and fuel economy have improved in twelve out of fourteen years and have repeatedly achieved new records. The trends in CO_2 emissions and fuel economy since 1975 are shown in Figure ES-1.

Preliminary data suggest further improvements in model year 2019. Average estimated real-world CO_2 emissions are projected to fall 6 g/mi to 346 g/mi and fuel economy is projected to increase 0.4 mpg to 25.5 mpg. Projected data are shown in Figure ES-1 as a red dot because the values are based on manufacturer projections rather than final data.

Figure ES-1. Estimated Real-World CO_2 and Fuel Economy



Manufacturers have made significant improvements in fuel economy and CO_2 emissions over the last 5 years

Over the last five years, eleven of the fourteen largest manufacturers selling vehicles in the U.S. market improved both estimated real-world CO_2 emissions and fuel economy of their new vehicle fleets. One manufacturer, Tesla, improved fuel economy (as measured in miles per gallon of gasoline equivalent, or mpge) but not tailpipe CO_2 emissions, because their all-electric fleet produces no tailpipe CO_2 emissions. Two of the fourteen manufacturers increased CO_2 emissions and decreased fuel economy of their new vehicle fleets.

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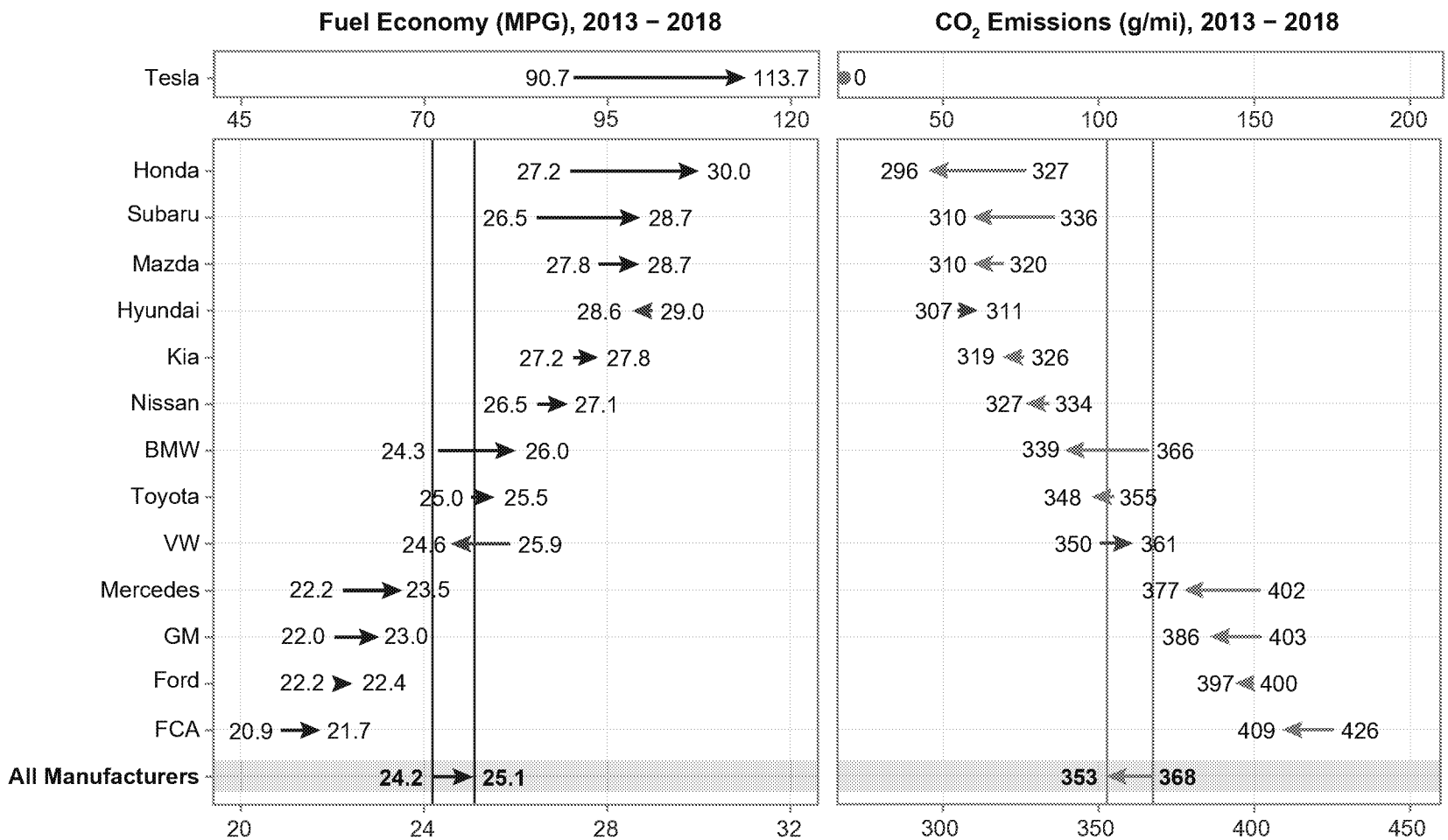
Figure ES-2. Changes in Estimated Real-World Fuel Economy and CO_2 for Large Manufacturers



The five-year span shown in Figure ES-2 covers the approximate length of a vehicle re-design cycle. It is likely that most vehicles have undergone design changes in this period, resulting in a more accurate depiction of recent manufacturer trends than focusing on a single year. The trends shown in Figure ES-2 are due to a combination of vehicle design changes and changes to the distribution of vehicles produced.

Many tables in this report show only manufacturers that produced more than 150,000 vehicles in the last model year. This year, Tesla crossed that threshold and is now shown along with the thirteen large manufacturers in last year's edition of this report. Since Tesla produces only electric vehicles, they had by far the lowest tailpipe CO_2 emissions, at 0 g/mi, and highest fuel economy, at 113.7 mpge, of all large manufacturers in model year 2018.

Of the remaining manufacturers, Honda had the lowest CO_2 emissions and highest fuel economy in model year 2018 and also achieved the largest 5-year improvements in CO_2 emissions and fuel economy. Between model years 2013 and 2018, Honda reduced CO_2 emissions by 31 g/mi and increased fuel economy by 2.8 mpg. Subaru and Mazda tied for the third lowest CO_2 emissions and third highest fuel economy in model year 2018. BMW had the second largest 5-year improvement in CO_2 emissions, reducing emissions by 27 g/mi, and Subaru had the third largest improvement, at 26 g/mi. BMW also increased fuel economy by 1.7 mpg, while Subaru increased by 2.2 mpg.

Two manufacturers increased CO_2 emissions and reduced average fuel economy over the five-year span. Volkswagen had the largest increase in CO_2 emissions, at 11 g/mi, and the largest decrease in fuel economy, at 1.3 mpg, due mostly to a large shift towards SUVs. FCA had the highest new vehicle average CO_2 emissions and lowest fuel economy of the large manufacturers in model year 2018, followed by Ford and GM.

Sport utility vehicles continue to gain market share, with all vehicle types achieving record low CO_2 emissions and record high fuel economy

In this report, vehicles are disaggregated into five vehicle types: sedan/wagon, car SUV, truck SUV, pickup truck, and minivan/van. Car SUVs are generally smaller 2WD SUVs while truck SUVs are larger or 4WD vehicles. The distinction between car and truck SUVs is based on regulatory definitions and is important because cars and trucks are subject to different GHG and fuel economy standards. Sedan/wagons and car SUVs are subject to the car regulatory standards while truck SUVs, pickups, and minivans/vans are subject to the truck standards. Note that media reports generally consider all SUVs as trucks, which is different from the regulatory distinctions used in this report.

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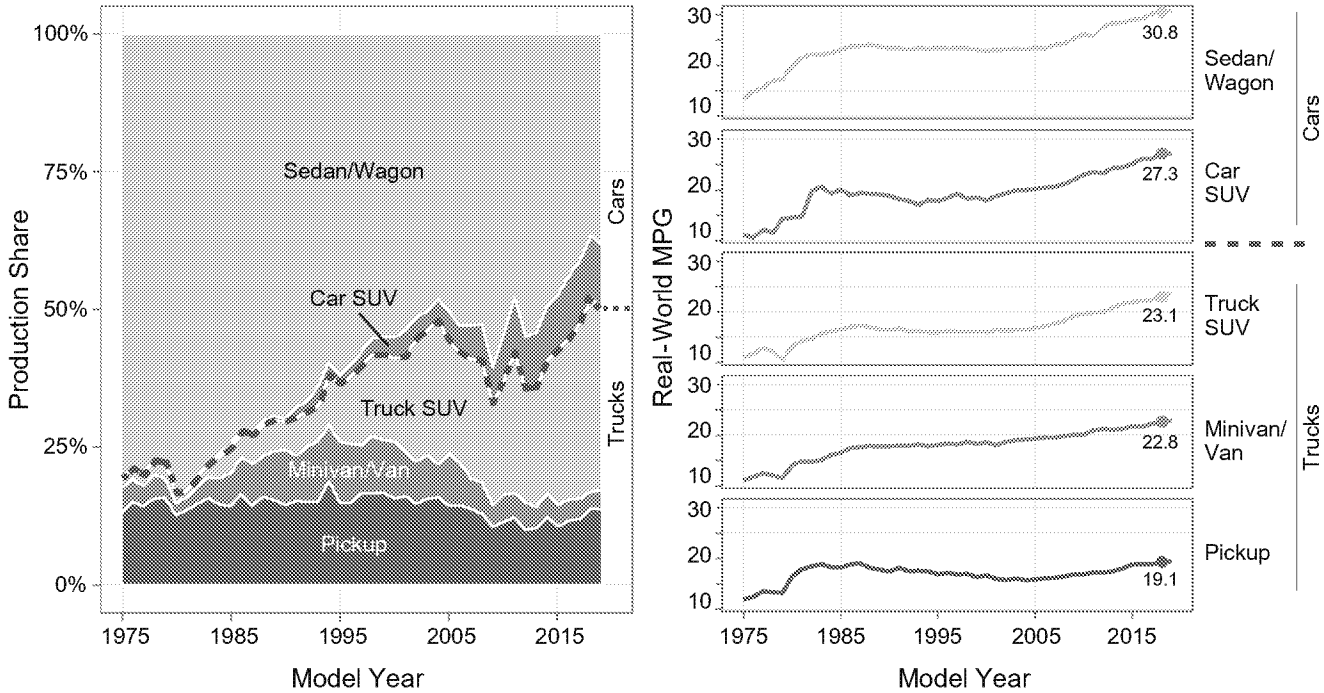
Figure ES-3. Production Share and Fuel Economy by Vehicle Type



The overall market continues to move towards both car SUVs and truck SUVs. Combined, car and truck SUVs captured a record high 46% market share in model year 2018. Truck SUVs improved fuel economy by 0.8 mpg and CO_2 emissions by 14 g/mile in model year 2018, while car SUVs improved fuel economy by 1.2 mpg and CO_2 emissions by 15 g/mile. Sedan/wagons fell to 37% of the market, or less than half of the market share they held in model year 1975, even as their fuel economy increased by 0.6 mpg.

All five vehicle types are at record low CO_2 emissions and record high fuel economy and have steadily improved in recent years. However, the market shift towards SUVs and away from sedan/wagons has offset some of the fleetwide benefits that otherwise would have been achieved from the increased fuel economy within each vehicle type.

Average new vehicle fuel economy and horsepower continue to increase, while weight remains constant

Vehicle weight and horsepower are two fundamental vehicle attributes that can influence a vehicle's CO_2 emissions and fuel economy. For vehicles with internal combustion engines, increased weight or horsepower generally results in higher CO_2 emissions and lower fuel economy. Weight is also an important metric for electric vehicles, as increased vehicle weight will generally result in lower fuel economy (measured in miles per gallon of gasoline equivalent). However, electric vehicles will produce zero tailpipe emissions regardless of weight or horsepower.

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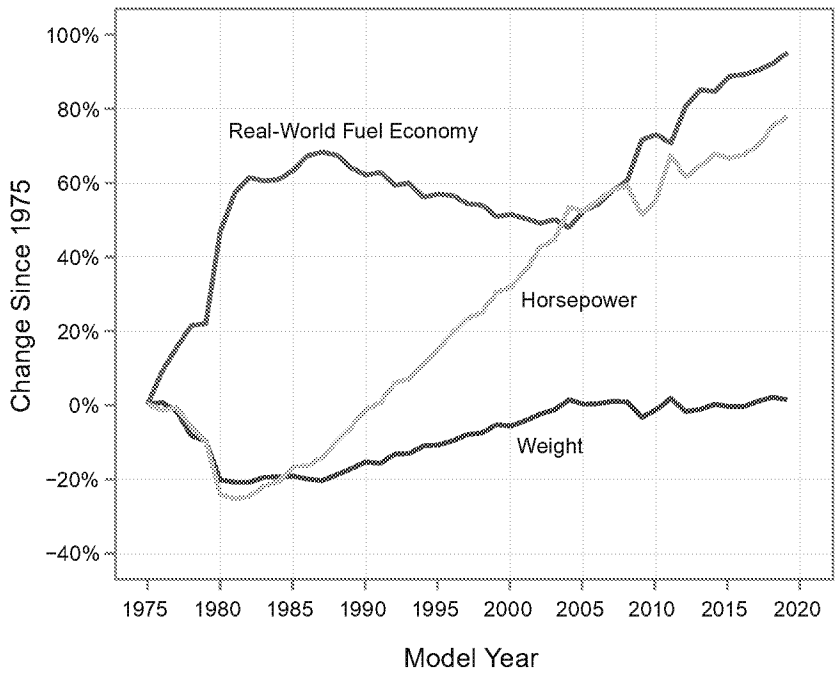
Over time, automotive technology innovation has been applied to vehicle design with differing emphasis between vehicle weight, power, CO_2 emissions and fuel economy (Figure ES-4). In the two decades before model year 2004, technology innovation was generally used to increase vehicle power, and weight increased due to changing vehicle design, increased vehicle size, and increased content. During this period, average new vehicle fuel economy steadily decreased and CO_2 emissions correspondingly increased. However, since model year 2004 technology has been used to increase fuel economy (up 30%) and power (up 14%), while maintaining vehicle weight and reducing CO_2 emissions (down 23%). Weight has generally been constant since 2004, but the slight increase in model year 2018 did result in the highest average new vehicle weight on record.

One additional vehicle metric not shown in Figure ES-4 is vehicle footprint, or the area enclosed by the four tires. Footprint is important because it is the basis for determining regulatory standards under the GHG and CAFE regulations. Since EPA began tracking footprint in model year 2008, average footprint has increased about 3%.

Figure ES-4. Estimated Real-World Fuel Economy, Horsepower, and Weight Since Model Year 1975



Manufacturers continue to adopt a wide array of advanced technologies

Technological innovation in the automobile industry has led to a wide array of technology available to manufacturers to achieve CO_2 emissions, fuel economy, and performance goals. Figure ES-5 illustrates projected manufacturer-specific technology adoption, with larger circles representing higher adoption rates, for model year 2019. The figure shows preliminary model year 2019 technology projections to provide insight on a quickly changing industry, even though there is some uncertainty in the preliminary data.

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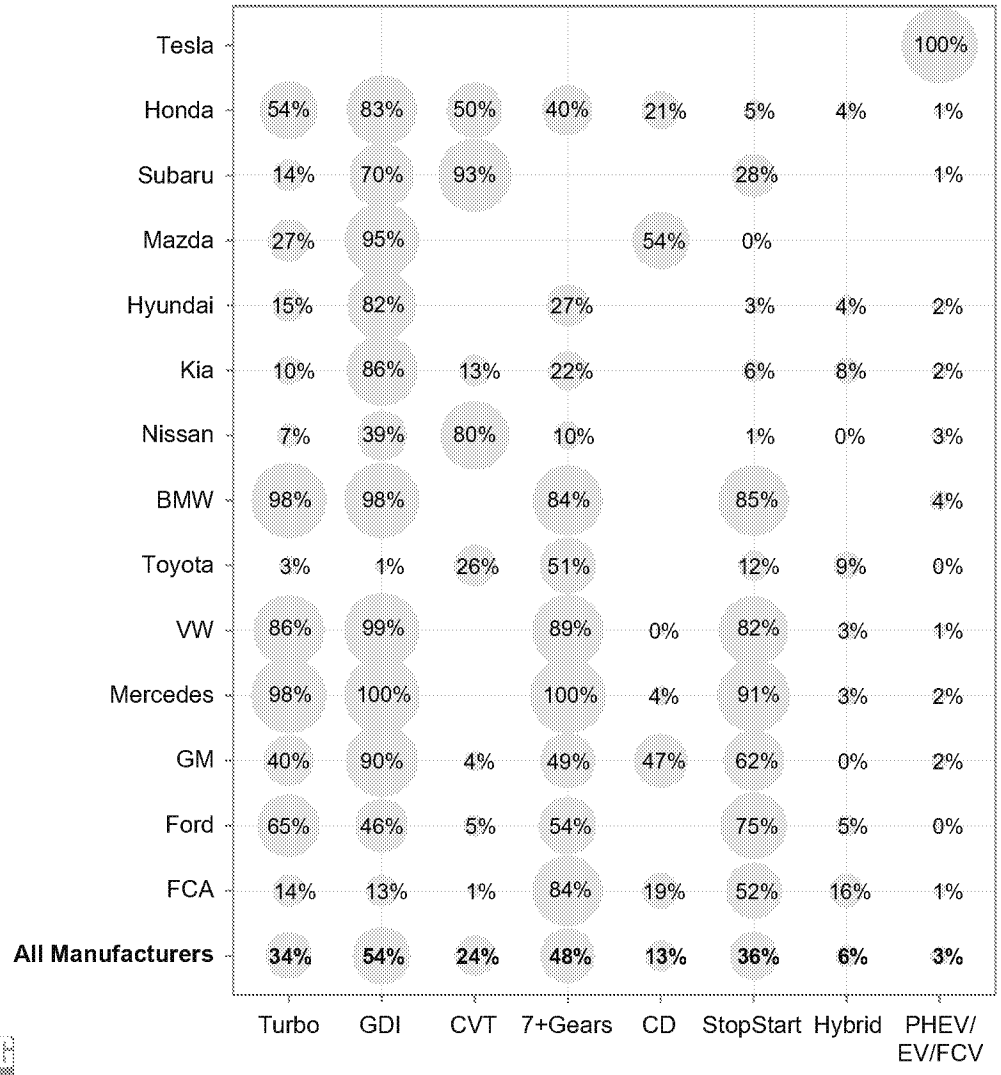
Engine technologies such as turbocharged engines (Turbo) and gasoline direct injection (GDI) allow for more efficient engine design and operation. Cylinder deactivation (CD) allows for use of only a portion of the engine when less power is needed, while stop/start systems can turn off the engine entirely at idle to save fuel. Hybrid vehicles use a larger battery to recapture braking energy and provide power when necessary, allowing for a smaller, more efficiently-operated engine. Transmissions that have more gear ratios, or speeds, allow the engine to more frequently operate near peak efficiency. Two categories of advanced transmissions are shown in Figure ES-5: transmission with seven or more discrete speeds (7+ Gears), and continuously variable transmissions (CVTs).

The technologies in Figure ES-5 are all being adopted by manufacturers to reduce CO_2 emissions and increase fuel economy, in some cases quite rapidly. For example, GDI was used in fewer than 3% of vehicles as recently as model year 2008 but is projected to be in more than 50% of vehicles in model year 2019. Electric vehicles (EVs), plug-in hybrid vehicles (PHEVs), and fuel cell vehicles (FCVs) are a small but growing percentage of new vehicles.

Figure ES-5. Technology Share for Large Manufacturers, Model Year 2019

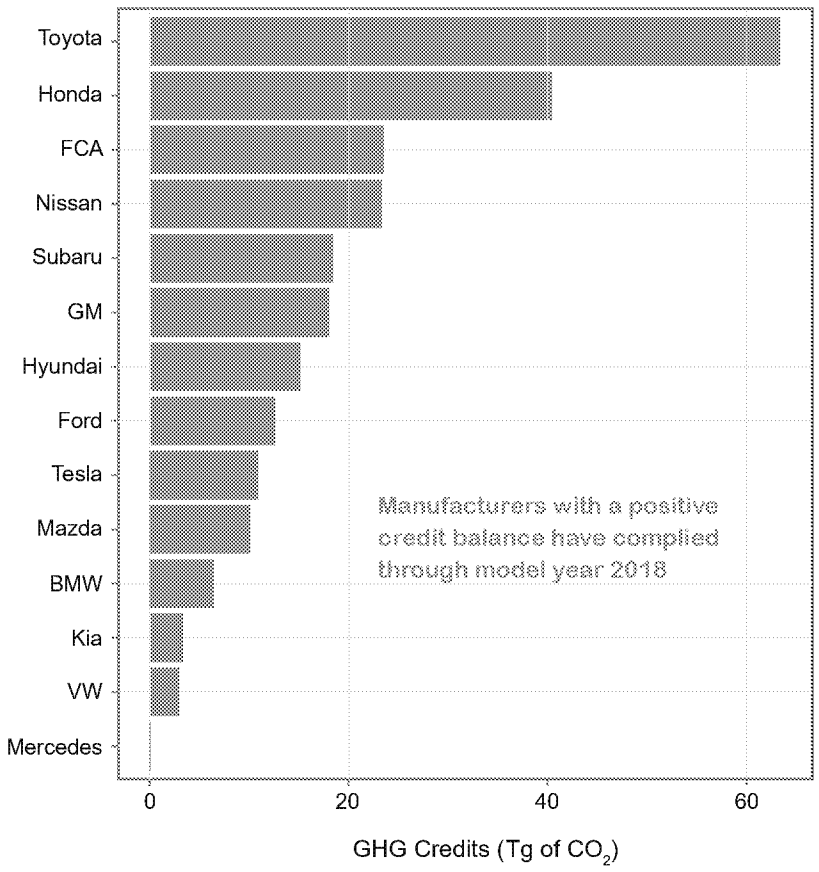


All fourteen large manufacturers achieved compliance with the GHG standards through the 2018 model year

EPA's GHG program is an averaging, banking, and trading (ABT) program. An ABT program means that the standards may be met on a fleet **average** basis, manufacturers may earn and **bank** credits to use later, and manufacturers may **trade** credits with other manufacturers. This provides manufacturers flexibility in meeting the standards while accounting for vehicle design cycles, introduction rates of new technologies and emission improvements, and evolving consumer preferences.

Manufacturers with average fleet emissions lower than the emissions standard generate credits by over complying with the standards. Because credits may not be carried forward unless deficits from all prior model years have been resolved, a positive credit balance means compliance with the current and all previous model years of the program. Any manufacturer with a deficit at the end of the model year has up to three years to offset the deficit with credits generated by future improvements beyond the standards or credits purchased from another manufacturer.

Figure ES-6. GHG Credit Balance for Large Manufacturers, After 2018 Model Year



All the large manufacturers (with production of more than 150,000 in model year 2018) ended the 2018 model year with a positive credit balance and are thus in compliance with model year 2018 and all previous years of the GHG program. The accumulated credits shown in Figure ES-6 will be carried forward for use in future model years. Total credits are shown in **teragrams** (one billion kilograms), which accounts for manufacturer performance compared to their standards, expected vehicle lifetime miles driven, and the number of vehicles produced by each manufacturer, for all years of the GHG program.

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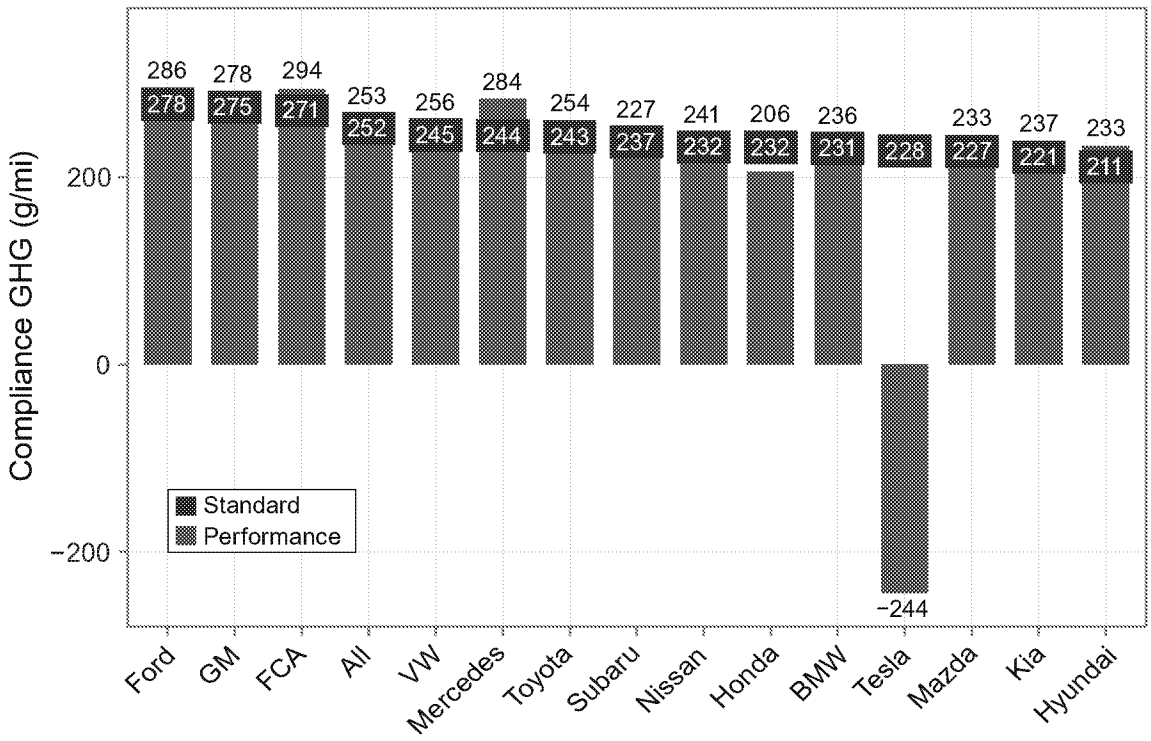
Manufacturers used different combinations of technology improvements and banked credits to achieve compliance in 2018

Overall, the industry was within 1 gram/mile of complying with the standards without using banked credits. Individual manufacturers however, used different strategies to maintain compliance in model year 2018. Three large manufacturers achieved compliance based on the emission performance of their vehicles, without utilizing additional banked credits. Most other large manufacturers used banked or purchased credits, along with technology improvements, to demonstrate compliance in model year 2018.

Figure ES-7 illustrates the performance of individual large manufacturers in model year 2018 compared to their overall standard, in terms of an average vehicle grams per mile emission rate. This "snapshot" provides insight into how the large manufacturers performed against the standards in model year 2018, but it does not account for banked credits or credit transactions between companies. Thus, Figure ES-7 does not reflect that each of these manufacturers ultimately complied with the model year 2018 standards.

Figure ES-7. Performance and Standards by Manufacturer, 2018 Model Year



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The regulations include an "incentive multiplier" for certain technologies for the 2017-2021 model years. This multiplier allowed each 2018 model year electric vehicle to be counted as two. The impact of the incentive is particularly evident for Tesla because they produce only electric vehicles with 0 g/mi tailpipe emissions. Tesla's standard was 228 g/mi, so on average each Tesla vehicle creates 228 g/mi of credits (plus 16 g/mi of air conditioning and off-cycle credits) before including the multiplier. The incentive multiplier doubles those credits, resulting in an effective performance value of -244 grams/mile, as shown in Figure ES-7.

The manufacturers with emissions above their standards (i.e., generating a 2018 model year deficit) used banked or purchased credits to achieve compliance in model year 2018. All these manufacturers had credits available from previous years, and/or they were able to purchase credits to ensure their credit balance remained positive after model year 2018.

The industry generated almost as many credits as it used in 2018, maintaining a large bank of credits for future model years

The industry emerged from model year 2018 with a bank of more than 250 teragrams (Tg) of GHG credits, as seen in Figure ES-8. Based on their compliance strategy, many manufacturers used credits in model year 2018, but far fewer credits than in the previous two model years. As a result, to maintain compliance the industry depleted their collective credit bank by about 4 Tg, or less than 2% of the total available credit balance. In addition to the balance of the industry-wide bank, the expiration date and distribution of credits are also important factors. Credits earned in model year 2017 or beyond have a five-year life, while all prior credits (78% of the current bank) will expire at the end of model year 2021. At the present time, an active credit market is enabling manufacturers to purchase credits to demonstrate compliance, although the availability of current or future credits is inherently uncertain.

The industry was able to accrue credits before the standards took effect in model year 2012 for early deployment of efficient vehicles and technology (the "early credit" program). The industry generated additional credits the first four years of the program, as the industry GHG performance was below the standards. In the last three years, the industry GHG performance has been above the standards, resulting in withdrawals from the bank of credits to maintain compliance.

In model year 2018, the industry improved overall compliance GHG performance by 10 g/mi. While this was not enough to meet the standard, the gap between the standard and GHG performance narrowed to 1 g/mi from 5 g/mi. Improving vehicle GHG emissions, as well as the electric vehicle incentive multiplier, led to this industry-wide improvement.

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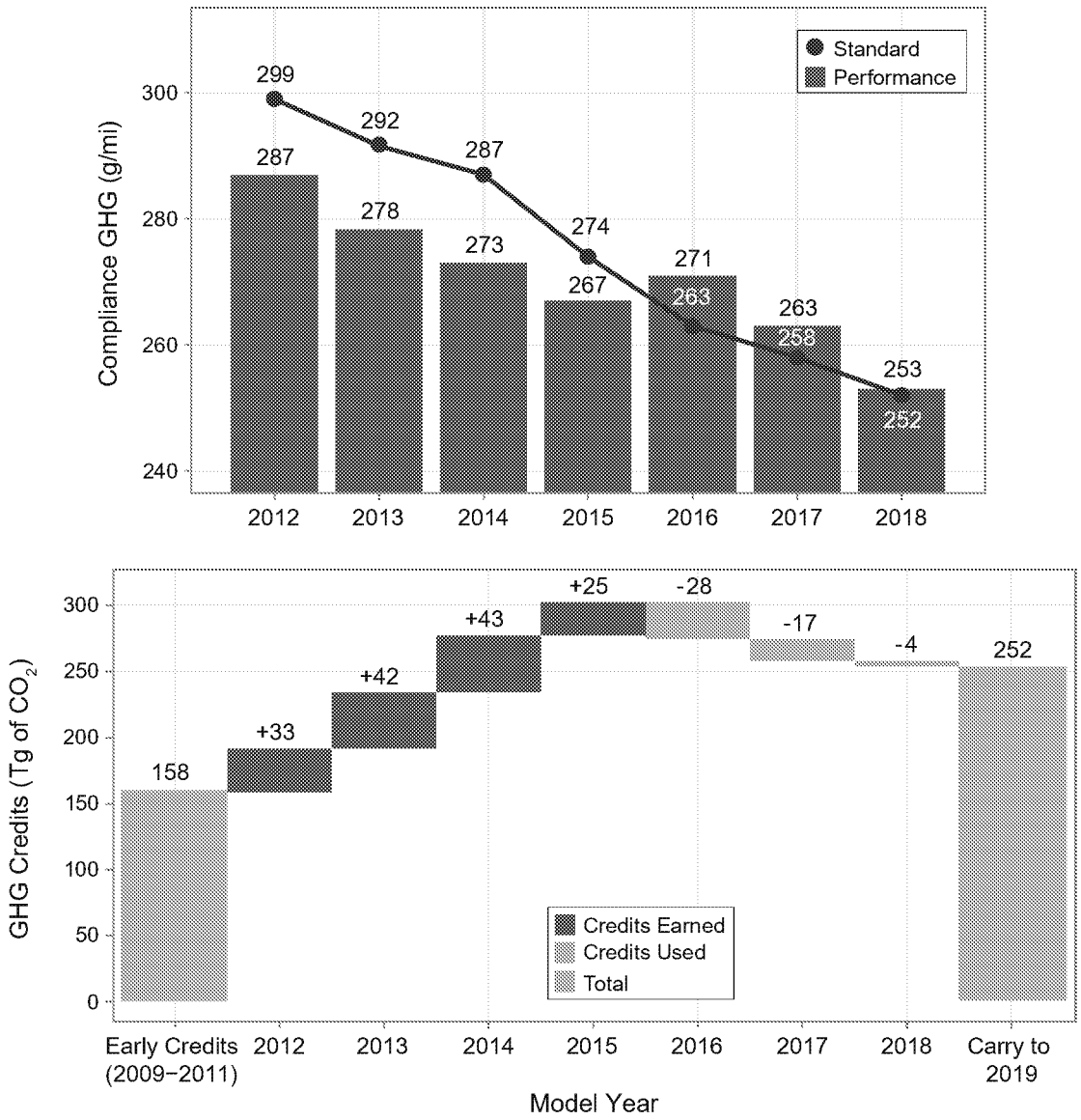
Figure ES-8. Industry Performance and Standards, Credit Generation and Use



The automobile industry continues to innovate, improve, and meet the GHG standards

The analysis here is a snapshot of the data collected by EPA in support of several important regulatory programs and is presented with the intent of providing as much transparency to the public as possible. The data show the change and innovation in the industry since model year 1975, and the manufacturers' performance under EPA's GHG standards.

To download the full report, or to explore the data using EPA's new interactive data tools, visit the report webpage at www.epa.gov/automotive-trends.

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NOTICE: This technical report does not necessarily represent final EPA decisions, positions, or approval or validation of compliance data reported to EPA by manufacturers. It is intended to present technical analysis of issues using data that are currently available and that may be subject to change. The purpose of the release of such reports is to facilitate the exchange of technical information and to inform the public of technical developments.

These data reflect the most current available data. Historic data have been adjusted, when appropriate, to reflect the result of compliance investigations by EPA or any other corrections necessary to maintain data integrity. This edition of the report supersedes all previous versions.

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Message

From: Simon, Karl [Simon.Karl@epa.gov]
Sent: 2/12/2020 5:33:17 PM
To: Bunker, Byron [bunker.byron@epa.gov]; Charmley, William [charmley.william@epa.gov]; Cook, Leila [cook.leila@epa.gov]; Dunham, Sarah [Dunham.Sarah@epa.gov]; Haley, Mike [Haley.Mike@epa.gov]; Haugen, David [haugen.david@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Watkins, Erica [Watkins.Erica@epa.gov]
Subject: FW: TRB Pecha Kucha slides
Attachments: TRB 2020 PDF.pdf

All,

I am sharing a set of slides that we used at a TCD division meeting to share some learning from the recent TRB conference with folks. We have done this type of presentation over the past few years as a way to condense all of the information into some manageable format. The topics picked by each presenter are what they think was a key point of learning from their experience at the conference. I would encourage you to share it with your staff and if folks are interested in learning more about the topic discussed on a slide, I believe there are names on each one. If not, either Chris R or Ben VanGessel can make the connection.

Karl

From: Ramig, Christopher <Ramig.Christopher@epa.gov>
Sent: Wednesday, February 12, 2020 12:18 PM
To: Simon, Karl <Simon.Karl@epa.gov>
Subject: TRB Pecha Kucha slides

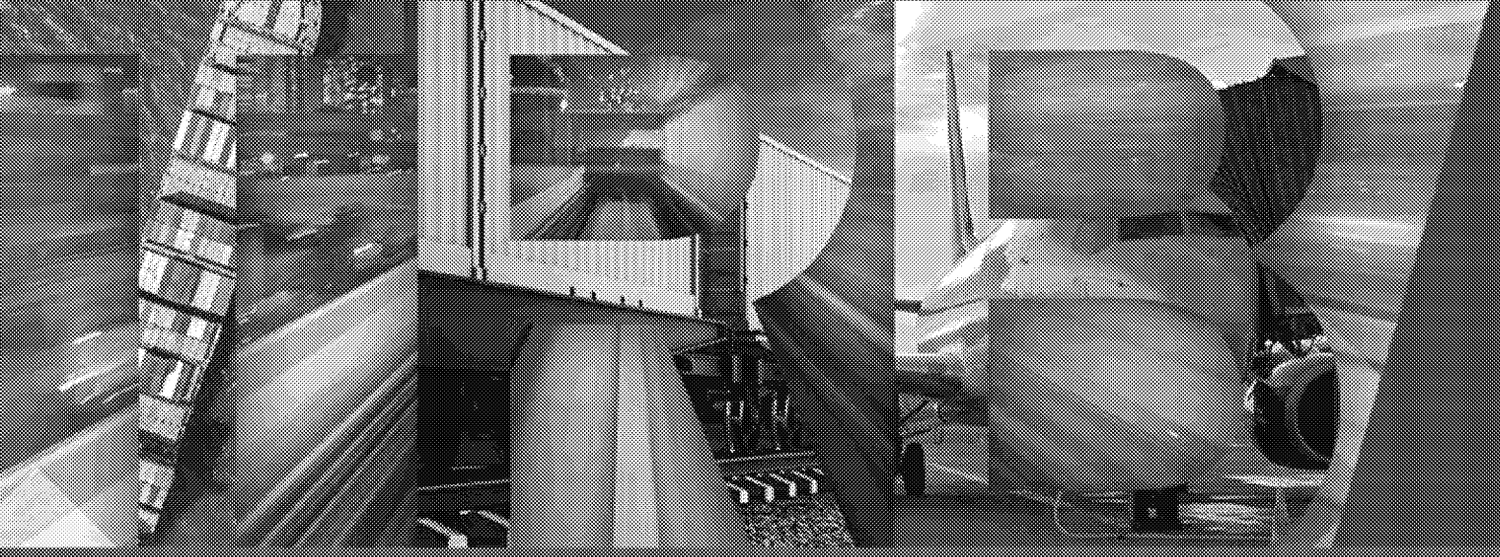
Hi Karl,

The TRB Pecha Kucha as a PPT document is 42 MB, so I'm attaching a PDF version. You can view the full presentation, with Kuang's neat aircraft video, on SharePoint here.

Thanks,

Chris Ramig
U.S. Environmental Protection Agency
Office of Transportation & Air Quality
Transportation & Climate Division
202-564-1372
ramig.christopher@epa.gov

Driving Innovation in Clean Transportation



TRB ANNUAL MEETING 2020

A CENTURY OF PROGRESS | FOUNDATION FOR THE FUTURE

99TH Annual Meeting › January 12–16, 2020 › Washington, DC

PechaKucha Presentation

The TCD Perspective

TRBAM 2020

PechaKucha (Japanese for "chit chat")

1 × 1

Min. **Slide**

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TRB AM 2020

PechaKucha (Japanese for "chit chat")

AA × DC

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STREET FIGHTER

VS

"…myopic focus on the traffic impacts (LOS) of new developments is misguided and may actually decrease accessibility and economic activity in an effort to protect traffic flows."

Benjamin VanGessel – SMTPC
Session: **Vehicle Miles Traveled Reduction as Climate Action**
Presentation: **California's Move to Reign in VMT**
Presenter: **Chris Ganson, California Governor's Office of Planning and Research**

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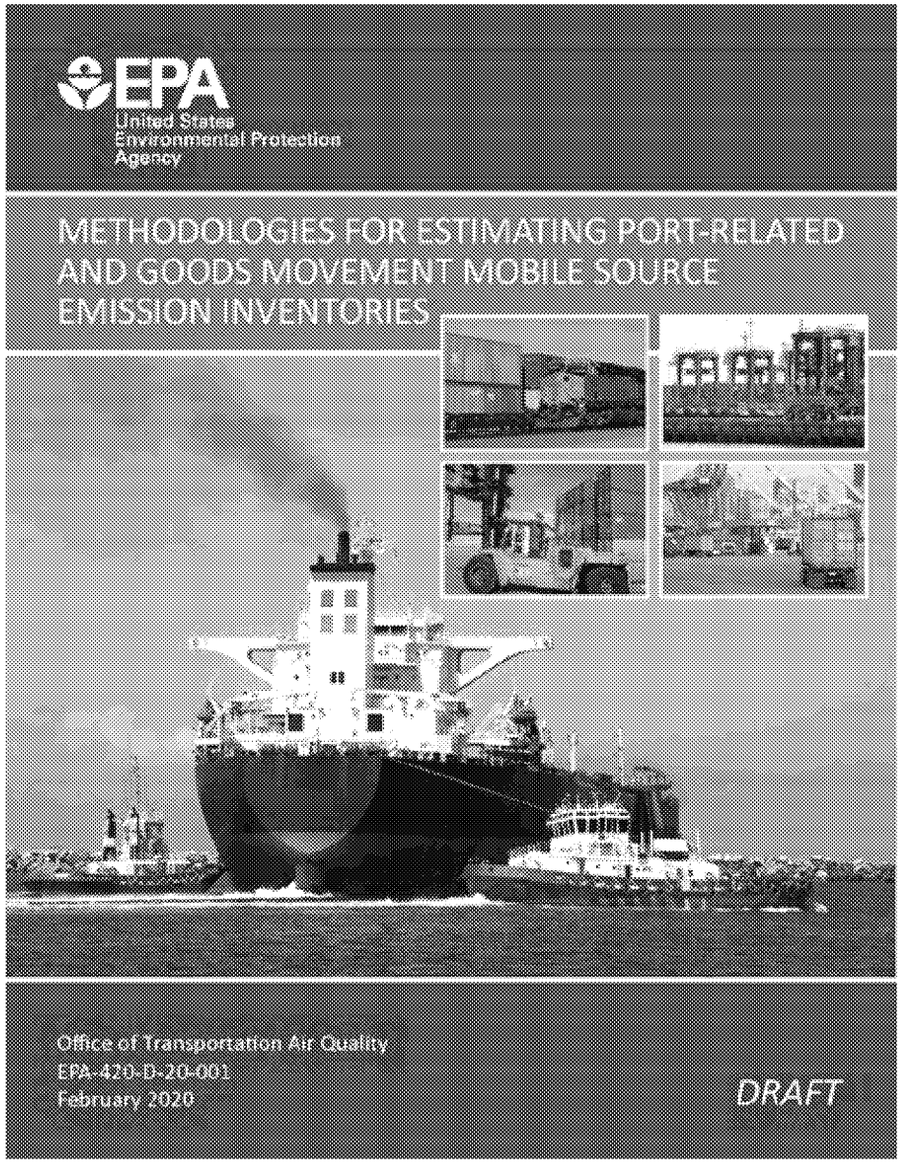
Marine Environment Committee Meeting

Discussed the draft ports methodologies document:

- Very well received—this has been a highly anticipated release for many of the members of this committee
- Connected with academics doing relevant research in this area



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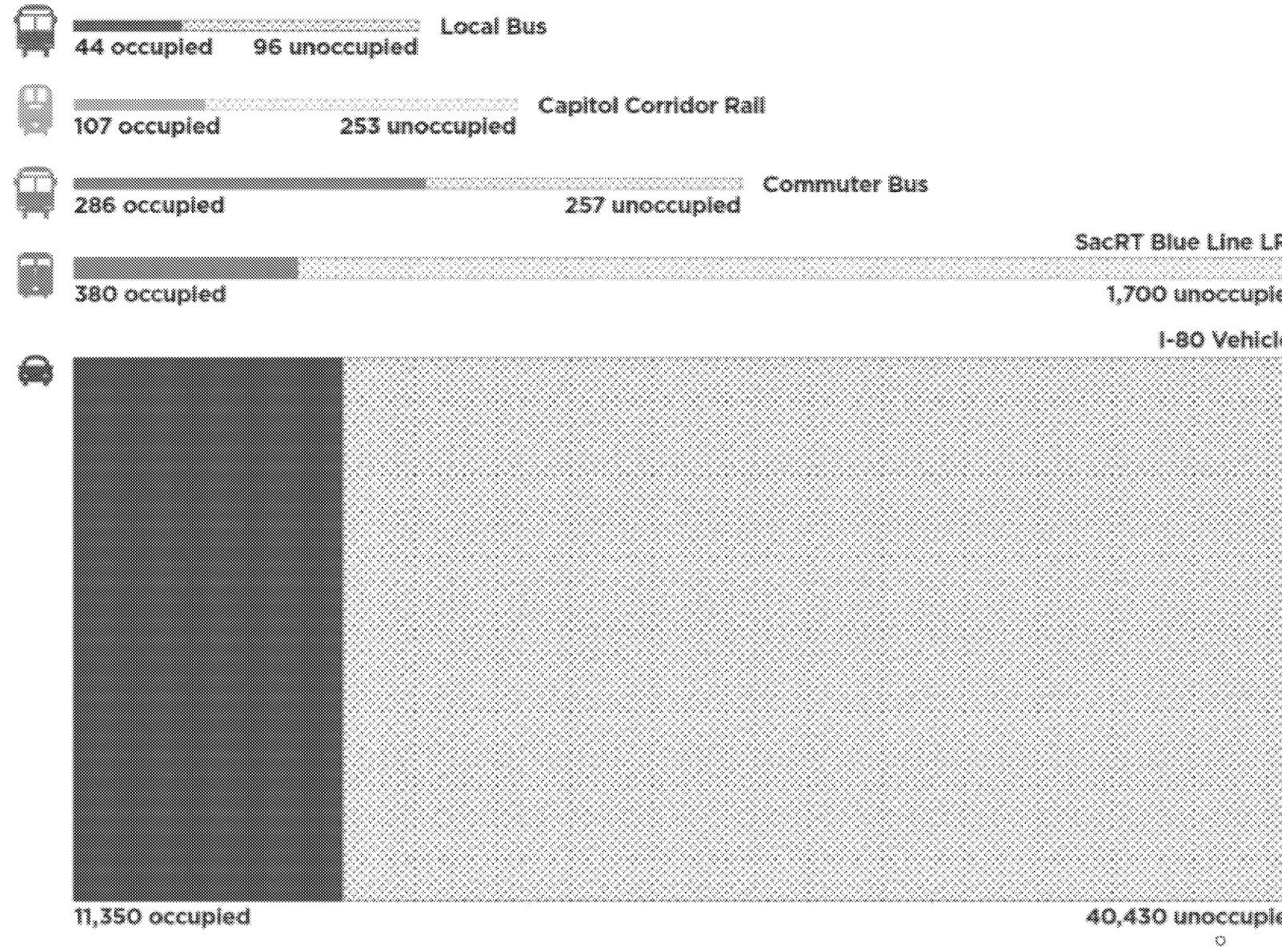
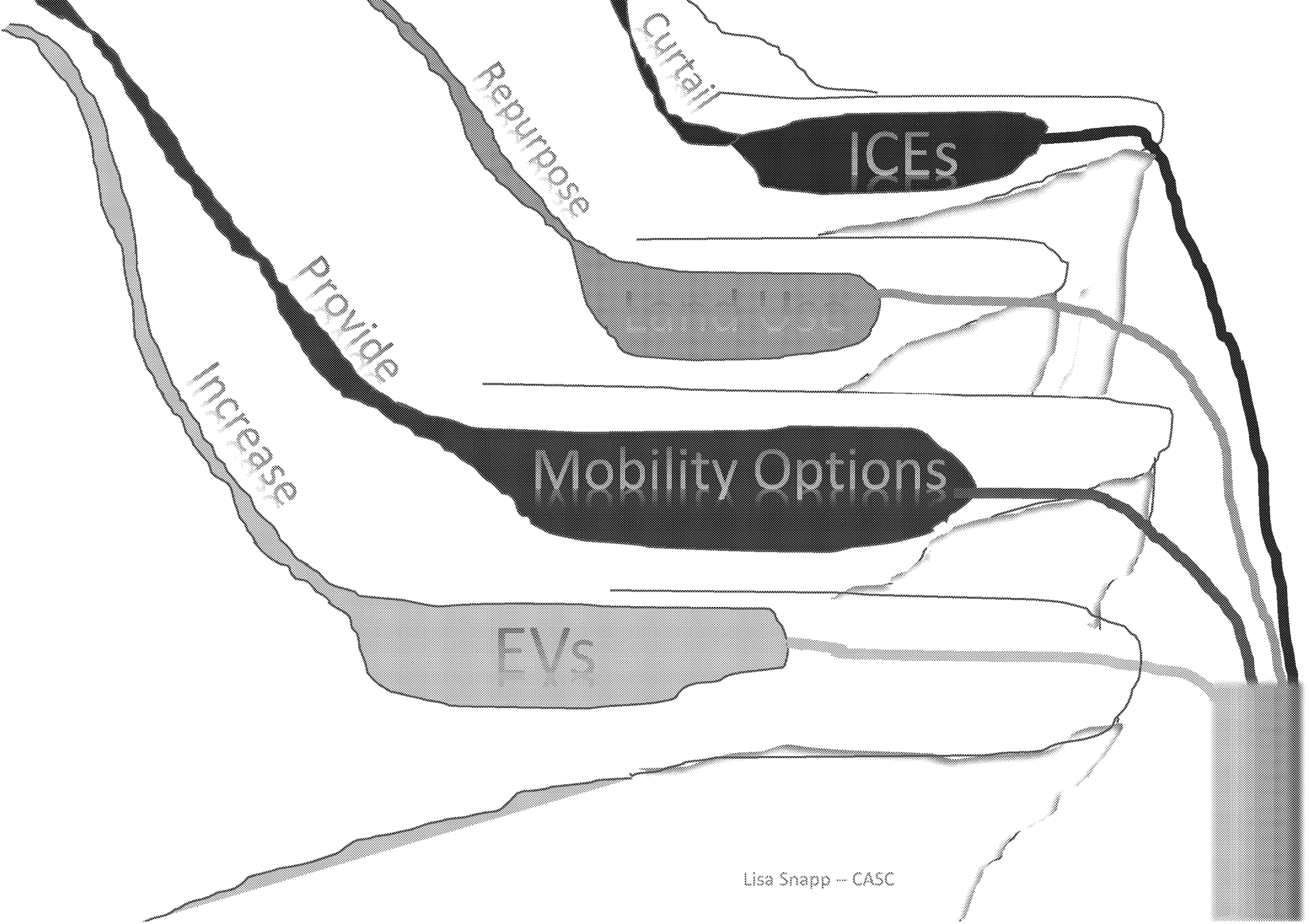
Is Pooling the Answer?

Seat Utilization AM Peak Hour, Peak Direction Business 80 – Sac., CA

Solving a seat utilization problem creates new solutions compared to solving a congestion problem



Laura Berry – SMTPC



Any one solution will plateau.

We need all four.

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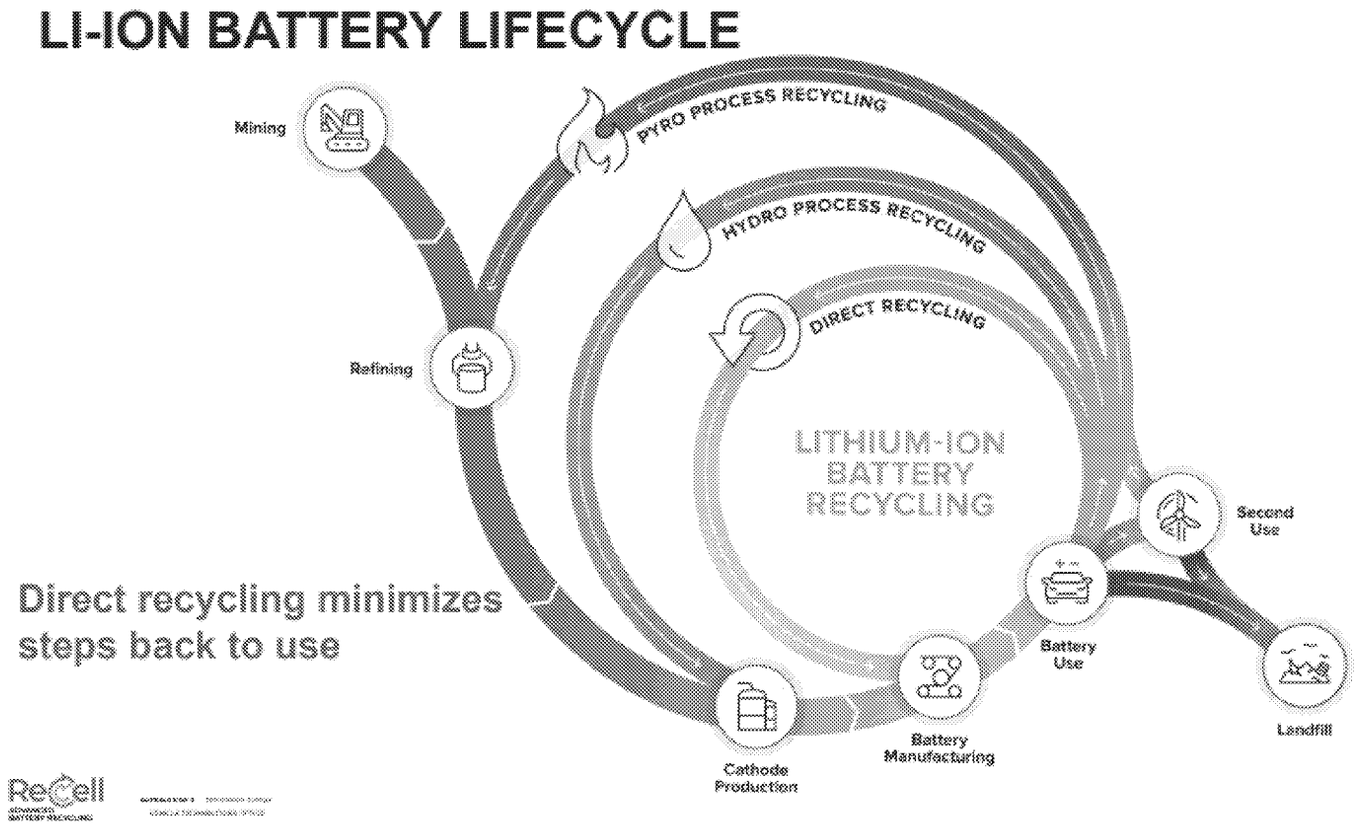
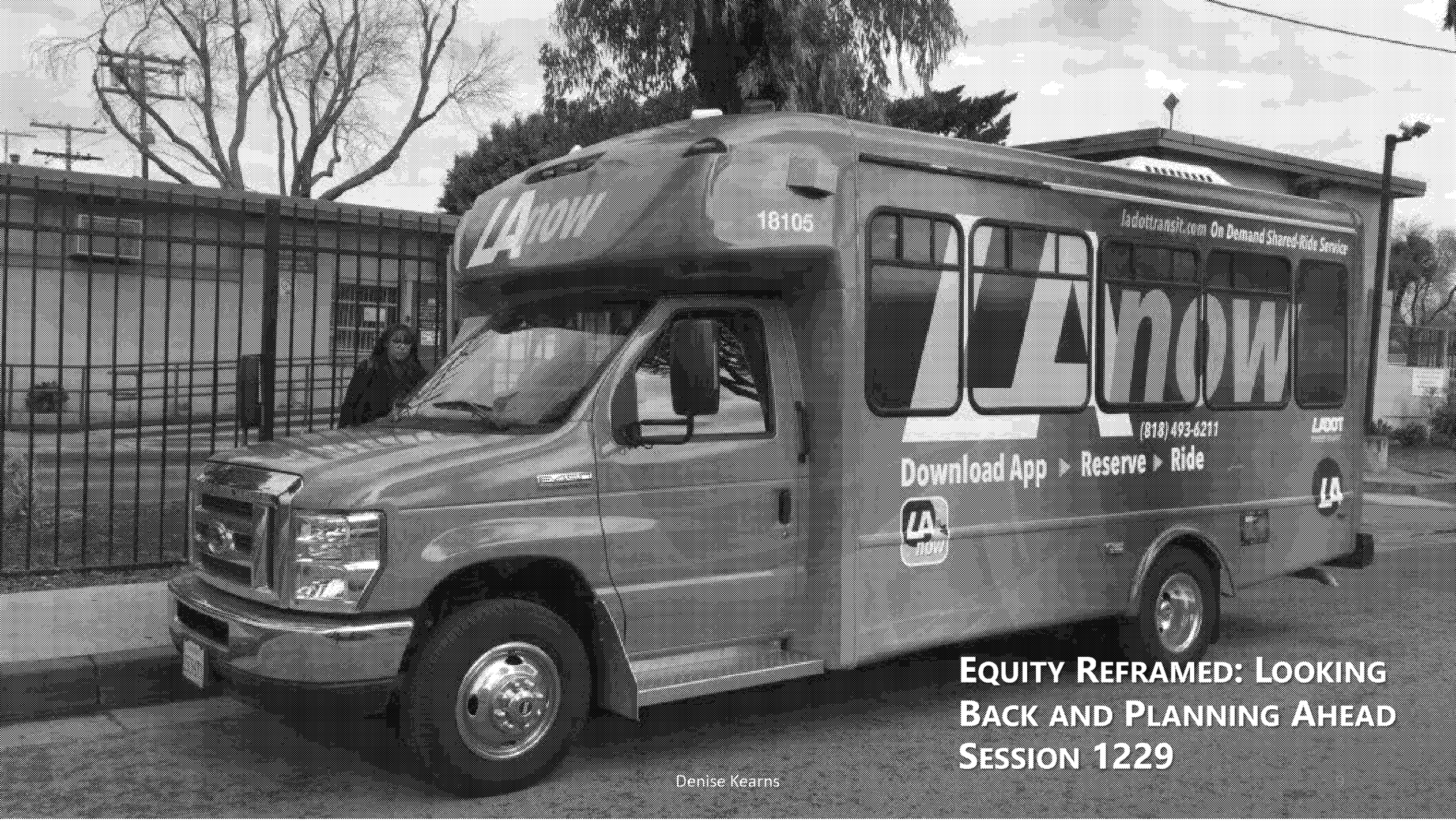
Toward Sustainable Management of Retired Electric Vehicle Batteries – TRB Workshop



Potential policy gaps noted at workshop:

- Clear labelling of battery materials
- Standardization of form
- “OBD” for battery management system
- All of above have issues of proprietary technology

[Amy Bunker]



Equity Reframed: Looking Back and Planning Ahead Session 1229

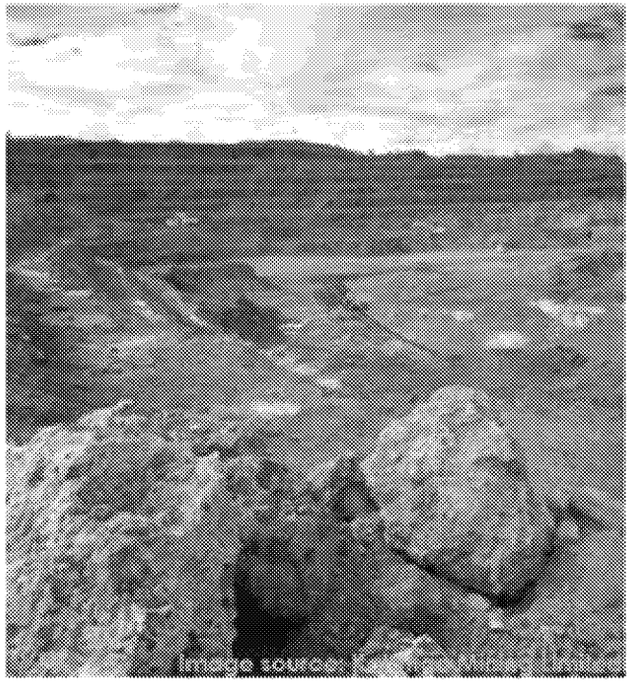
Denise Kearns

27

Co

Cobalt

58.933



BATTERY RECYCLING: KEY TO MEETING ELECTRIC VEHICLE DEMAND

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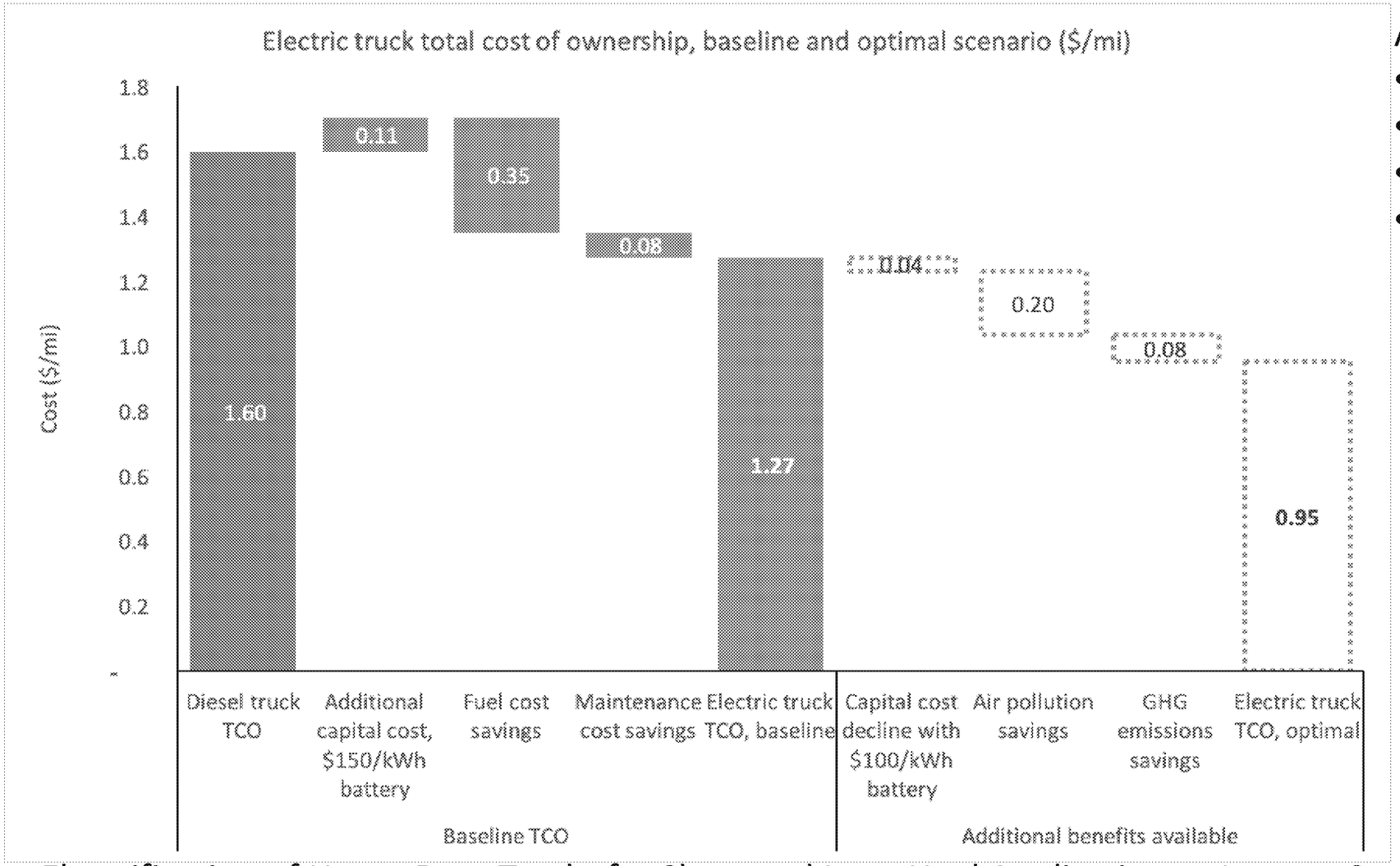
Long-haul battery electric trucks are technically feasible and economically compelling



Assumptions include:

- 400 mi range
- 104K miles/year driven
- $3.3/gal diesel
- $0.09/kWh charging cost

TRBAM 2020

PechaKucha (Japanese for "chit chat")

AA × DC

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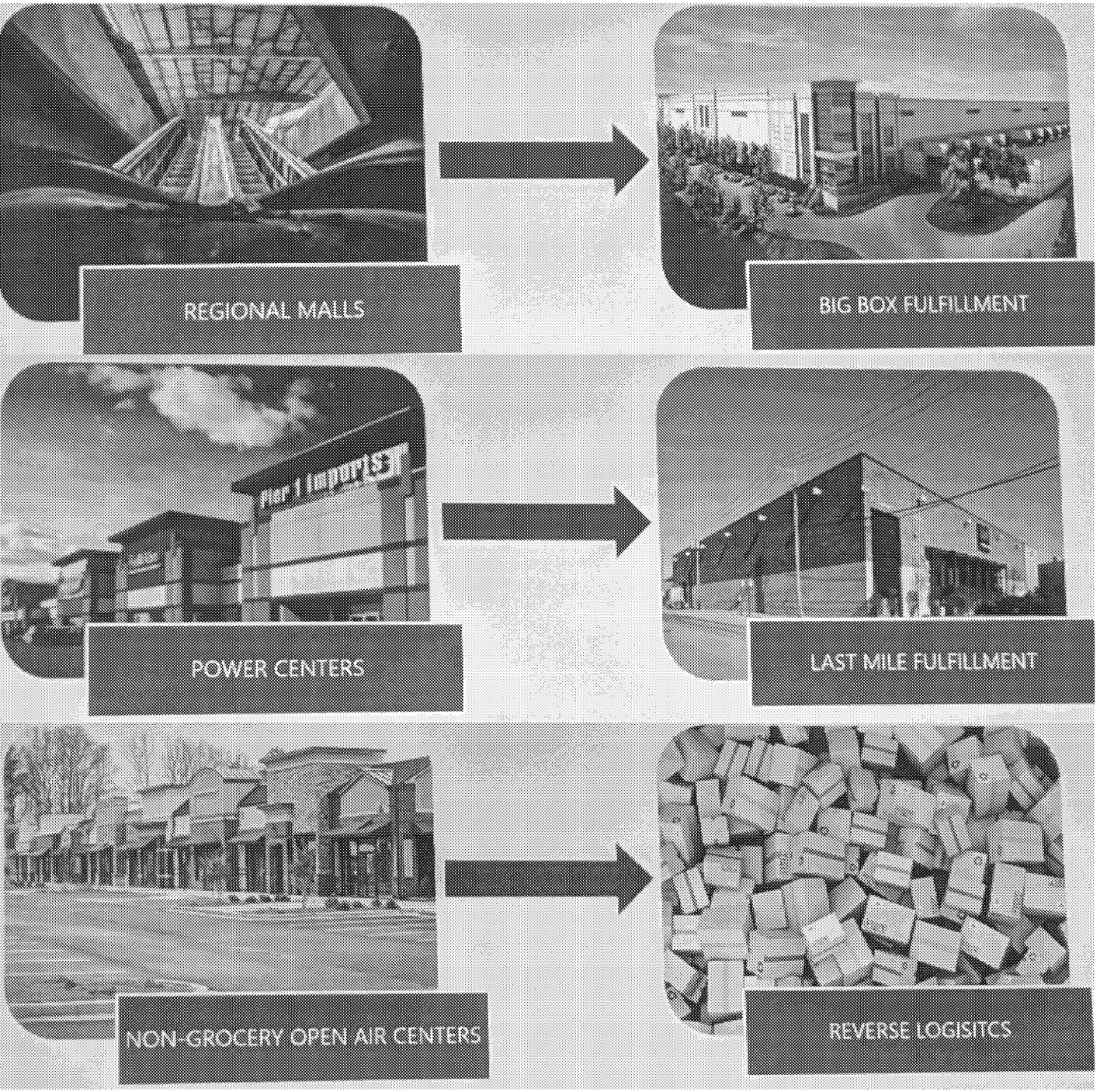

Repurposing Vacant Retail Space for eCommerce Warehousing

Problem: E-commerce companies have trouble finding US warehousing

- End of 2019: 4% warehouse vacancy in US
- Availability near population centers is especially scarce

Potential Solution: vacant retail space

- Malls & big box stores were built near people & highways
- Lots of vacancy at small regional malls, former big box power centers, strip malls

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What I learned at TRB 2020: the benefits of good poster design

By Susan Burke

Objective:

- Determine if certain poster designs lead to more productive engagement with researchers and better information flow

Background:

Poster design has evolved significantly over the last 25 years. This author still remembers when a standard approach to creating a conference poster was to print out 8.5 x 11 sheets of paper and pin them up—bulletin board style—at the conference itself. As design software became more abundant, posters shifted to single-sheet and (sometimes) well-designed displays. However, finding the main message still typically required standing close and searching through fine print as the author discussed her or his work.

Methodology:

Stroll through one of the TRB poster sessions, collecting data on different poster designs.

Streamlined poster designs:

- Increase the visibility of key takeaways
- Reduce socially awkward encounters <u>and</u>
- Provide access to detailed information that can be downloaded for later viewing

Take a picture to download the full paper

(actually directs to fueleconomy.gov)

Results:

While not yet widely adopted, a new design featuring the main takeaways in large print at the center of the poster was found at multiple booths. This design allowed the author to determine whether or not to approach the poster from a distance—reducing inefficient encounters with presenters.

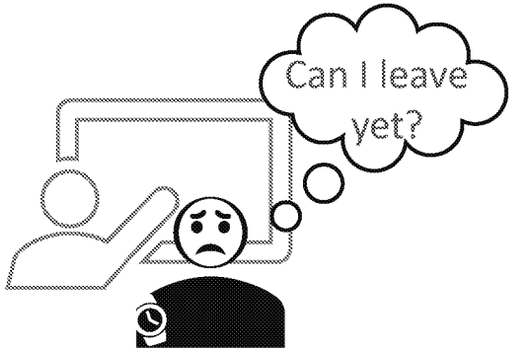


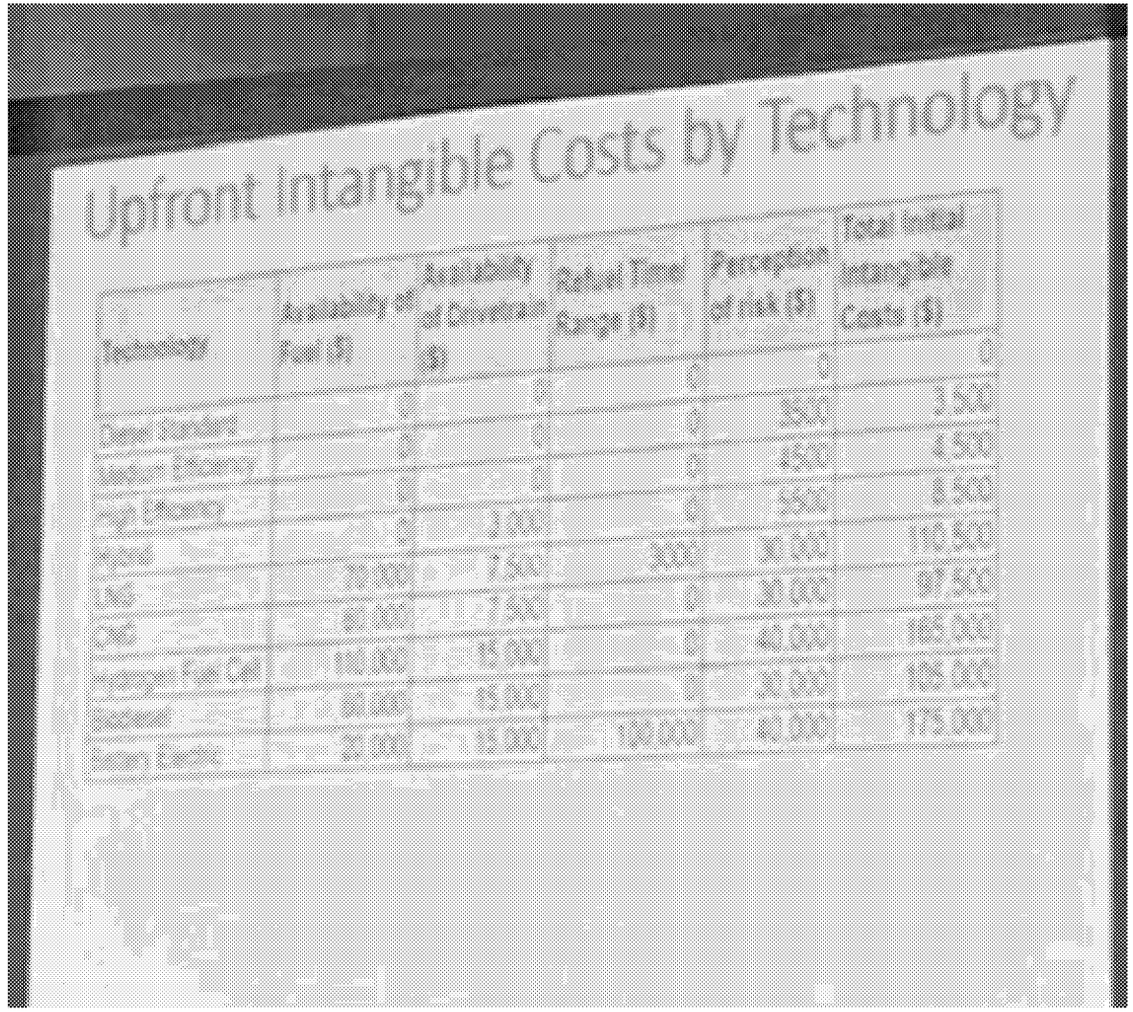
Figure 1. Example of socially awkward encounter commonly associated with traditional poster design.

Figure 2. Illustration of plots that could appear on a poster. No actual content included.

Recommendation:

- Consider streamlined poster designs for future TCD conference posters.

Susan Burke



Session: Which ZEV Drivetrains Are Winners? (Freight Day)

<u>Based on intangible costs</u>:

- Hydrogen is a serious contender
- Result mirrors views of end users (TTSI)
  - Battery electric is not the way for freight (long haul)
  - CNG is preferred for now (if not diesel)
  - Ideally H2 fuel cells is the future and functions well

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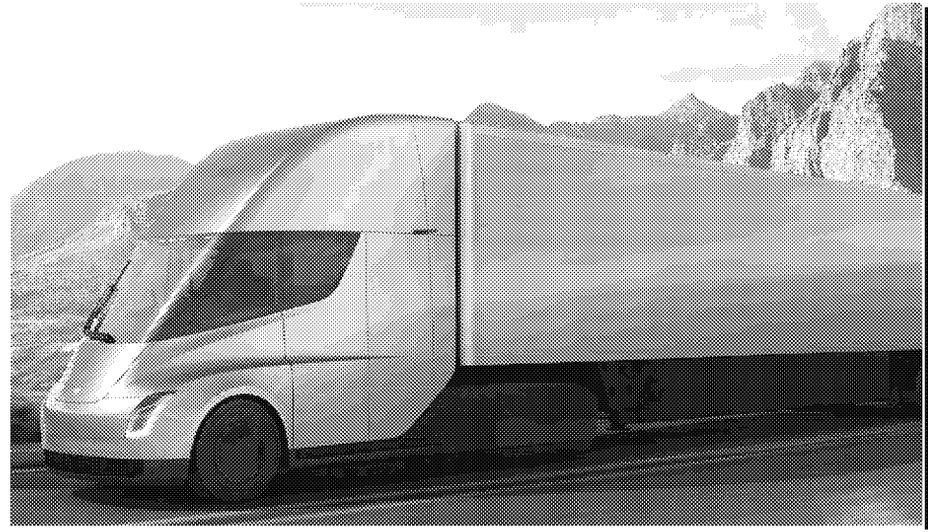
Electrification of HD trucks

- ↓ Battery pack costs (expect soon $100/kwh = $.50 /gal)
- ↓ Energy prices
- Significant pollution savings w/ NG power plants
- Battery durability much better than expected, low thermal degradation <2 °C
- Potential for a 3.5-year payback for EV truck
- Tesla SEMI



Lowest Cost of Ownership

Electric energy costs are half those of diesel. With fewer systems to maintain, the Tesla Semi provides $200,000+ in fuel savings and a two-year payback period.

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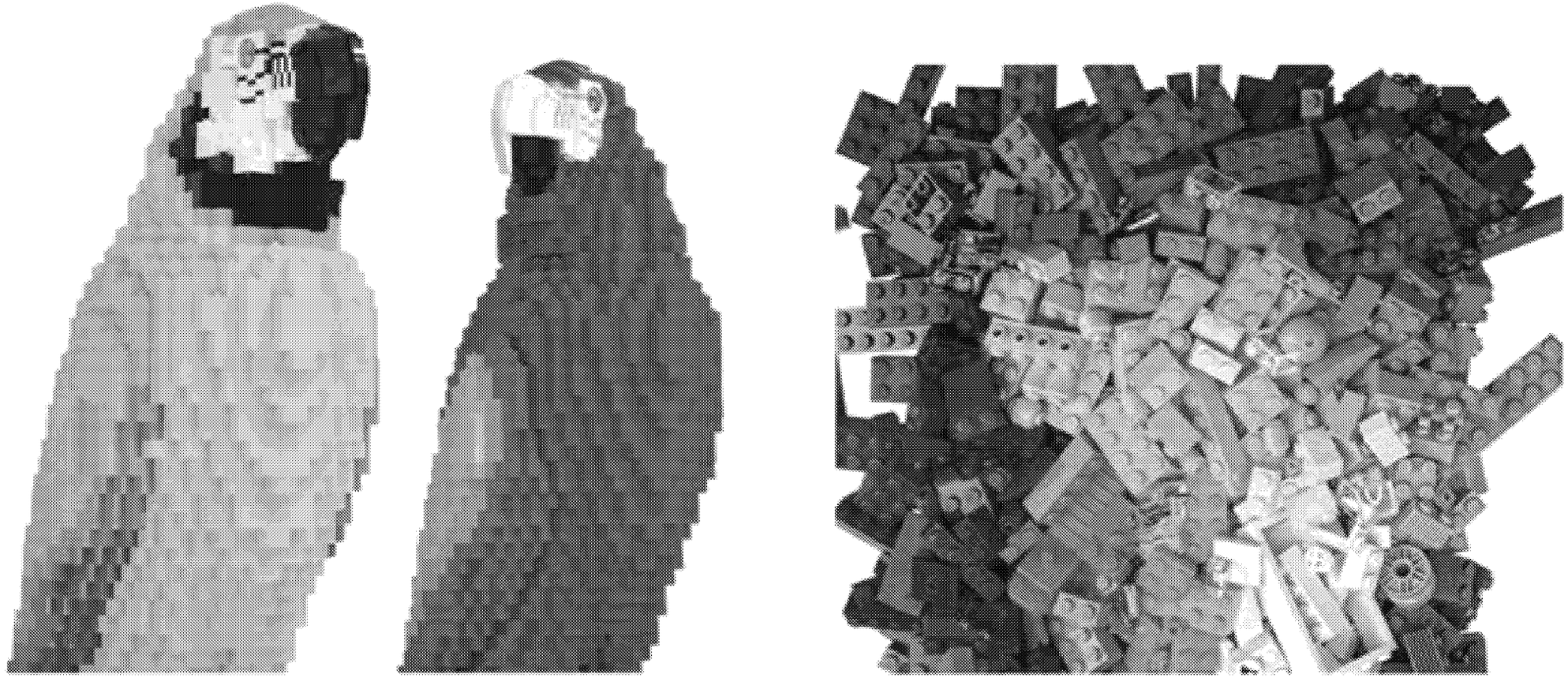


Jessica Daniels – CASC

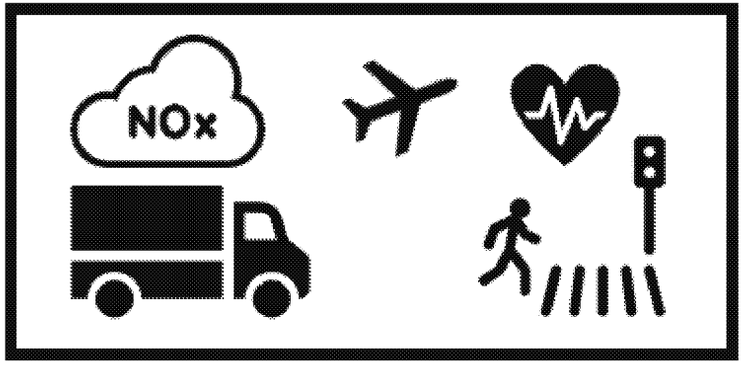
Graphic from Linda Gaines (ANL), Workshop 1773

THE ROLE OF THE STORE HAS CHANGED

FROM A SPACE OF TRANSACTIONS…

TO A SPACE FOR EXPERIENCES

BRICK-AND-MORTER BRANDS LEVERAGING E-COMMERCE



Stephanie Watson – LFIAC + Freight Day: Part 1 + CBRE Presentation by David Egan (Ecommerce and the Transformation of Commercial Real Estate)

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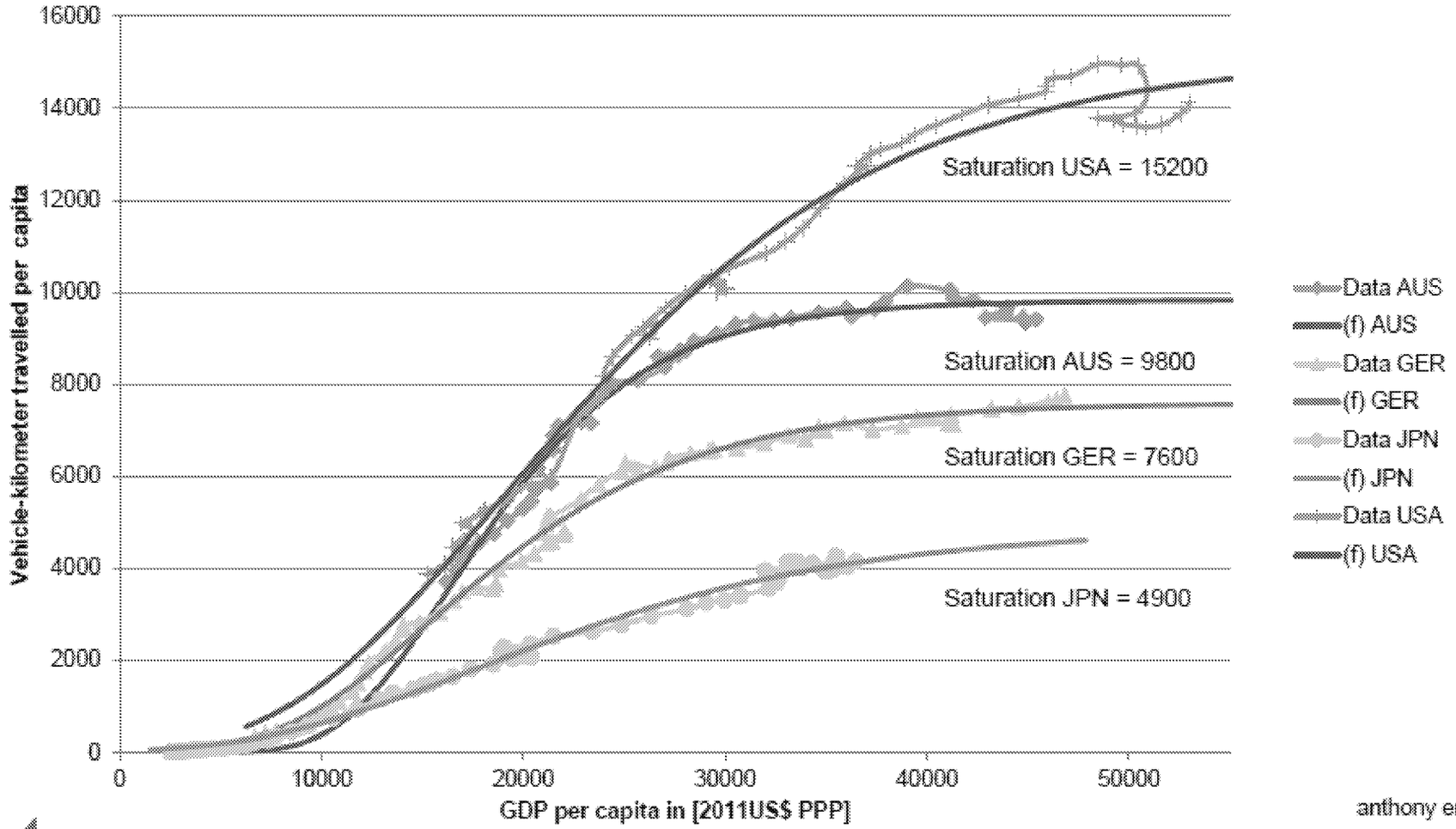
In terms of vehicle use, saturation levels are observed, but the different levels can not be explained by GDP per capita alone



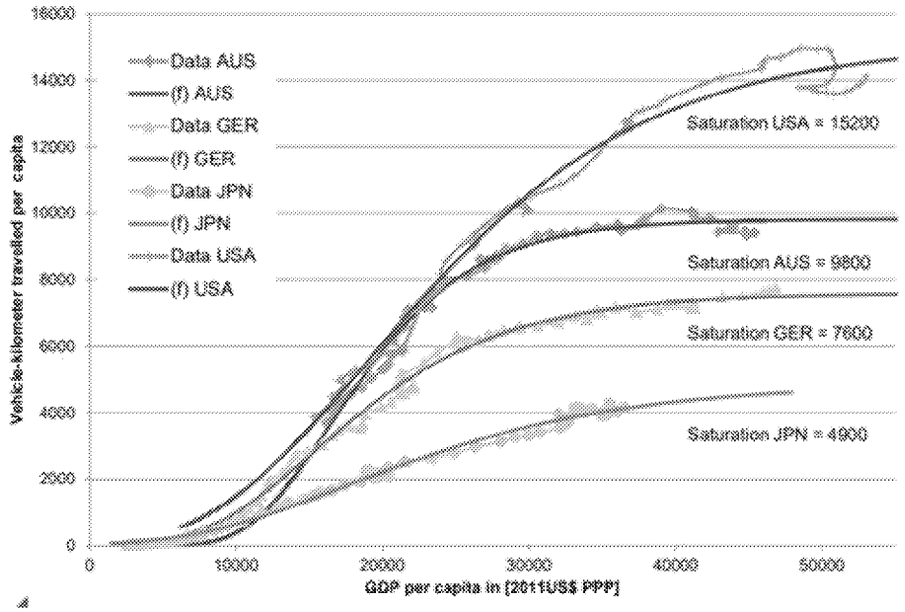
The dynamic phase of motorization lies between 10,000 and 35,000 GDP per capita

Data = statistical data

(f) = Gompertz-derived saturation curves

anthony erb

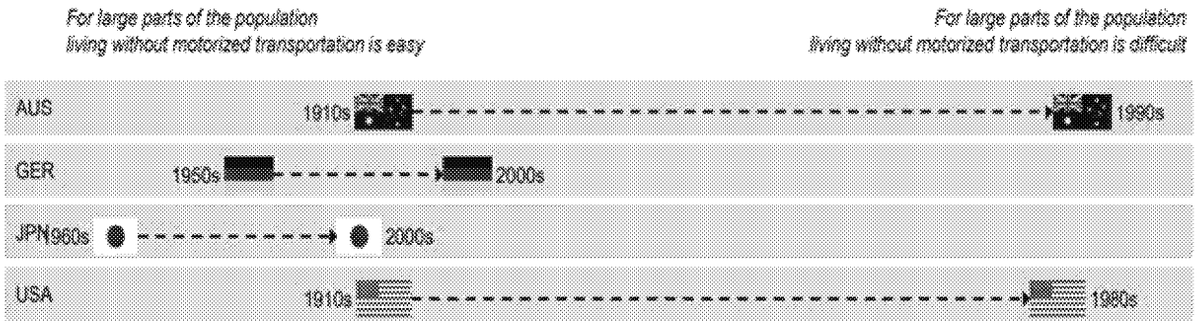
GDP alone does not explain VMT per capita



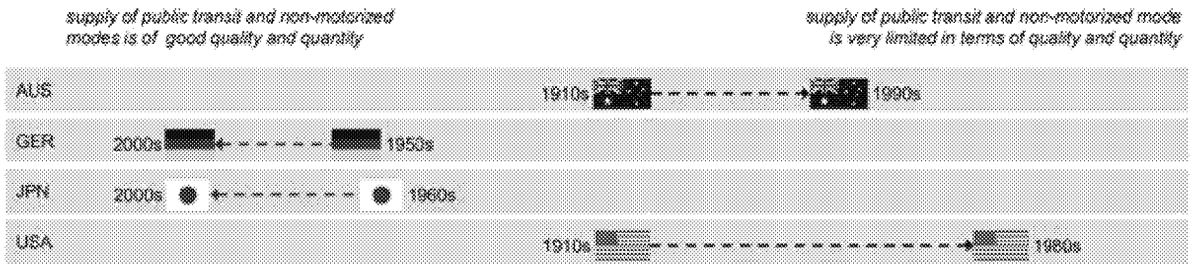
> "A developed country is not where the poor drive cars, it is where the rich use public transportation."
>
> Enrique Peñalosa, Former Mayor of Bogota

Primary factors influencing car ownership and use:

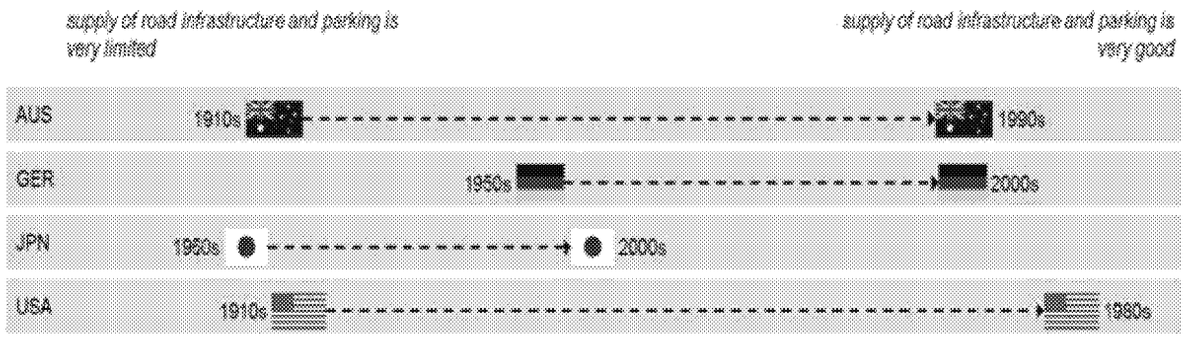
Spatial Dispersion



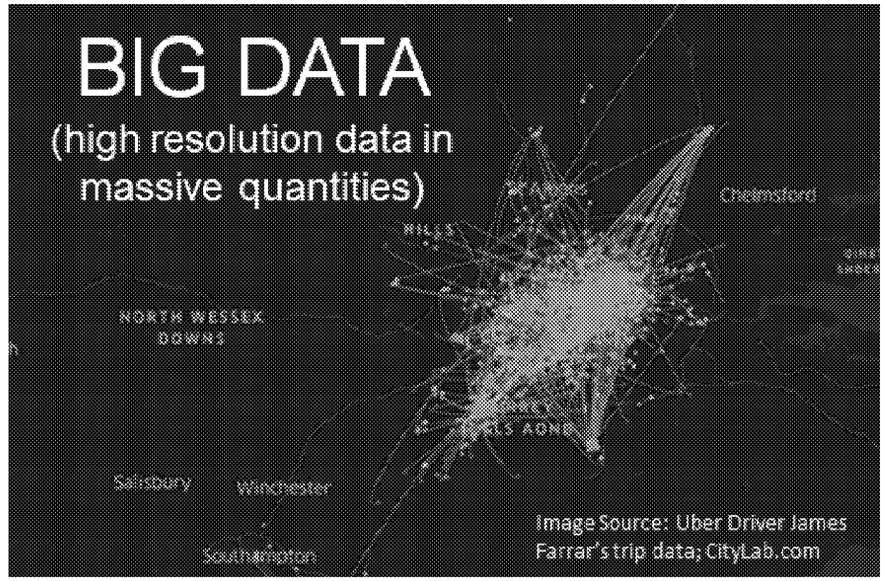
Lack of Alternatives



Car Infrastructure



Michelle Graff – CASC
Data & Graphics from Stefan Saum (DLR) – Session 1701

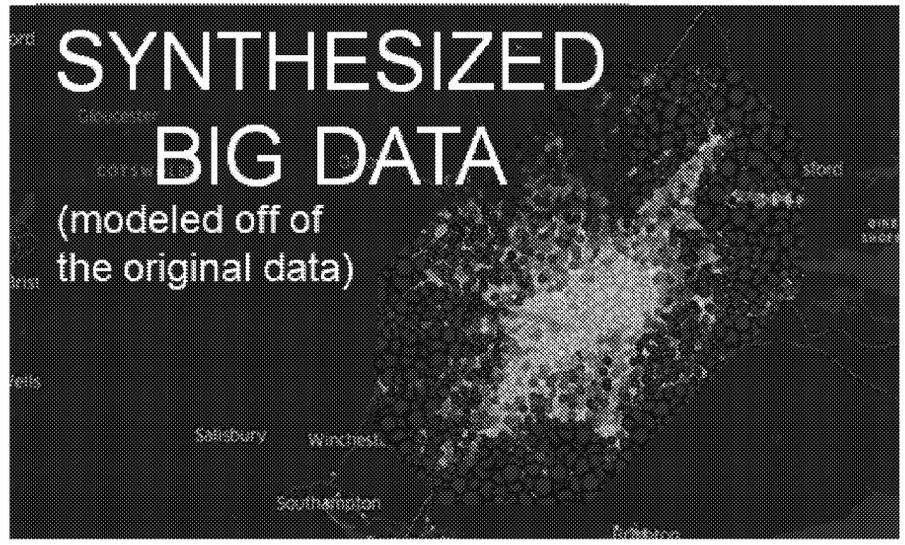


Security Concerns
Privacy Concerns
Data-ownership Questions
Changing Regulations/Policies

Route A

Answers to BIG Questions about our Rapidly Changing Transportation Ecosystem!

Route B



?

Is this a valuable use of resources?
What are its limitations?
Who decides how to synthesize the new data? Who gets access?

Equivalent Answers to BIG Questions about our Rapidly Changing Transportation Ecosystem ?

Discussion at end of Lectern Session 1392: 'Driver Behavior: Methods for Data Collection & Analysis'

[Sarah Harrison]

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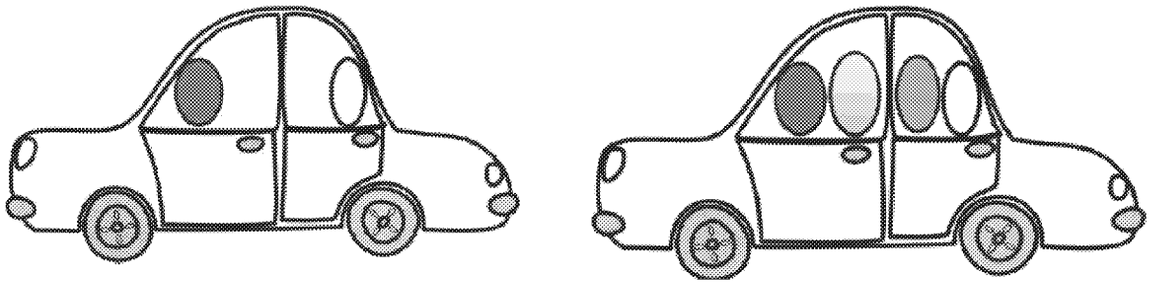
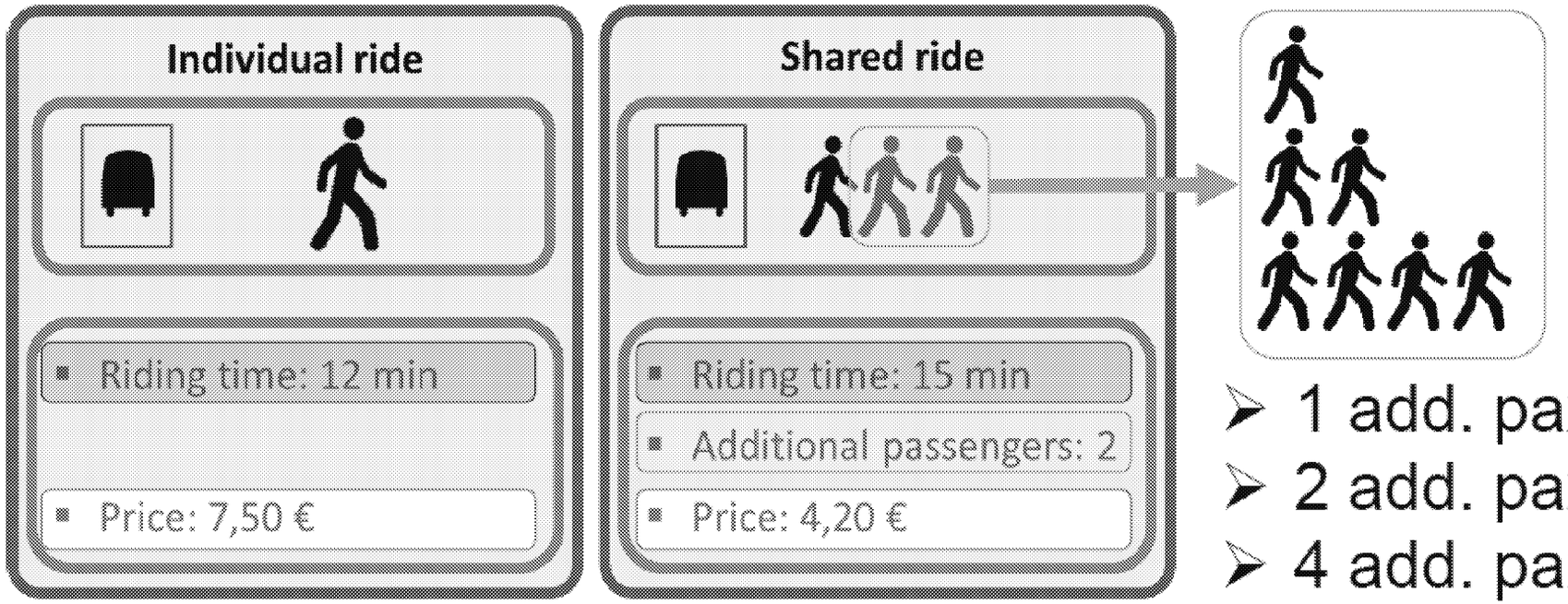
Why are there not more pooled rides?

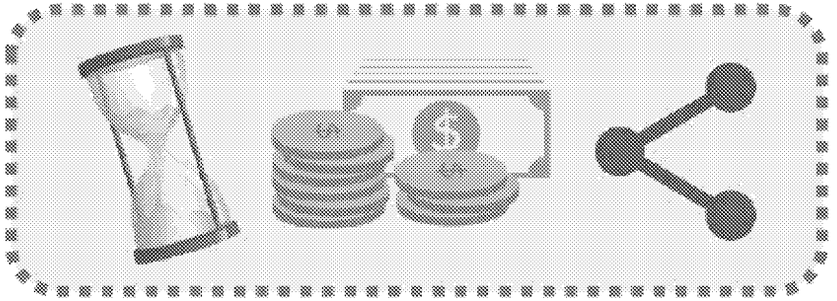




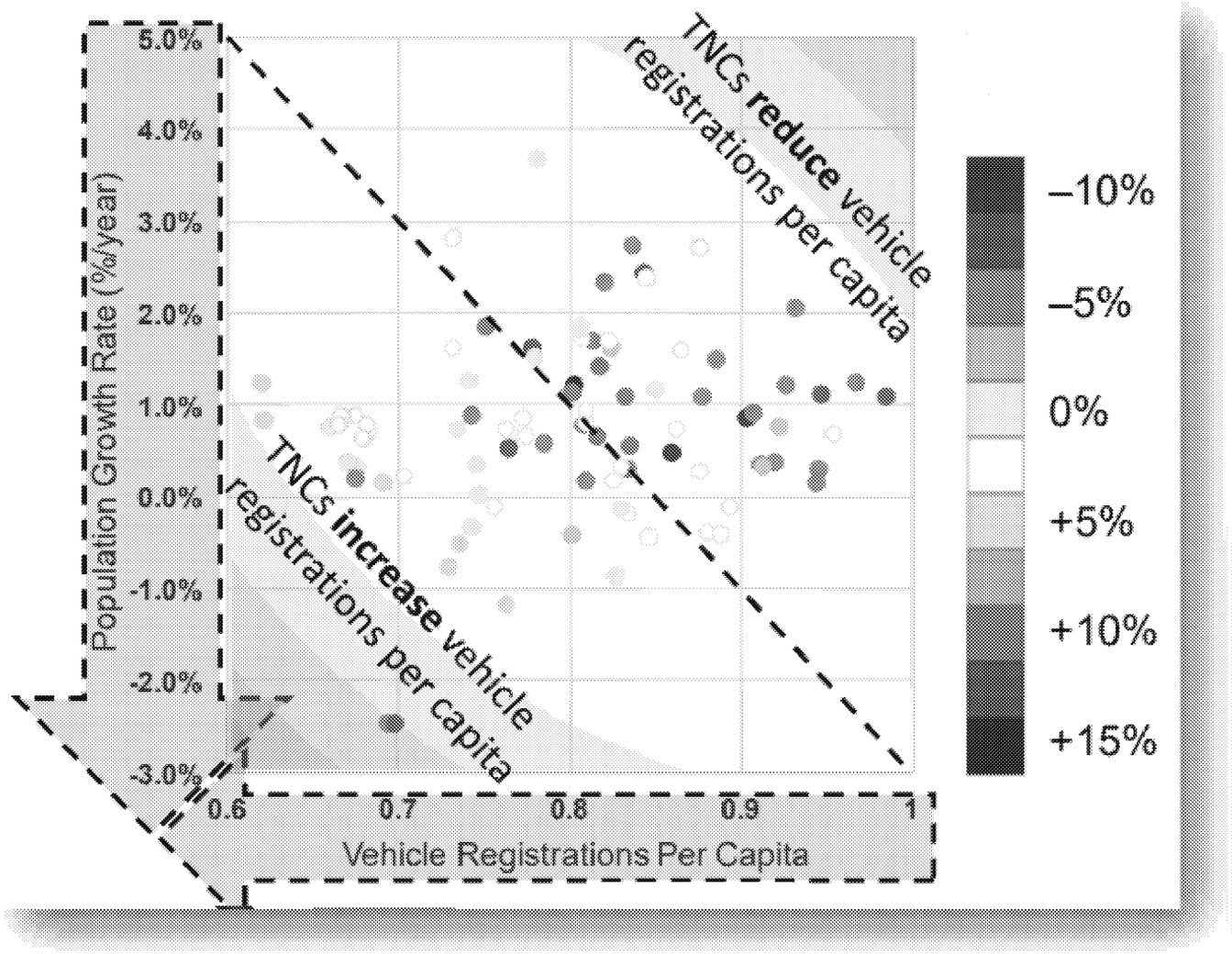
- Non-working individuals: 12.00 €/h (16.25 €/h)
- Working individuals: 14.50 €/h (20.08 €/h)

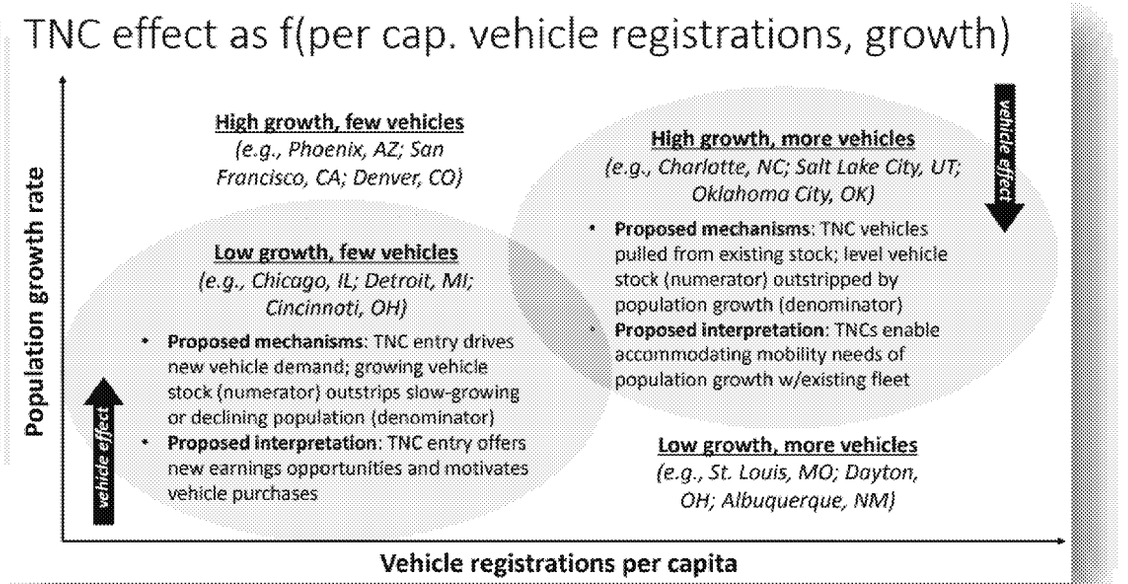
- 1 add. pax: 0.44 €/trip (0.52 €/trip)
- 2 add. pax: 0.44 €/trip (0.52 €/trip)
- 4 add. pax: 2.40 €/h (2.85 €/h)

Lab Smart Public Transport
TU Delft
Sharyn Lie
CEMC
Full slides available:
https://annualmeeting.mytrb.org/interactiveprogram/Details/13753



To buy or not to buy, that is the question…





Effects of On-Demand Ridesourcing on U.S. Vehicle Ownership, Energy, and Environmental Outcomes in the United States – Jacob Ward (DOE-VTO, Carnegie Mellon)

[Michael Shell - CEMC]

Problems with the Trinity?

- Autonomy
  - Zombie Miles = More Miles
  - AI Always On = More Power Needed
    - Not funny comment that AI might need a 2-stroke to power the computer on a BEV
- Ridesharing
  - More Deadheading? = More Miles
    - Observations from Uber/Lyft
- Electrification
  - More Electrification = Lower Fossil Fuel Prices?
  - Can we electrify transportation (cleanly) before the world melts?
- Autonomy + Ridesharing + Electrification = 50% Lower Transportation Costs? = More Sprawl? = More Travel + Emissions?

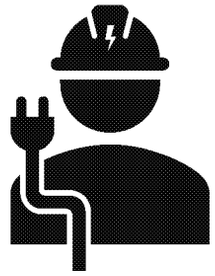
Diversity

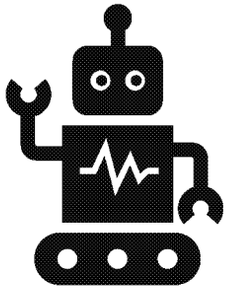
- Inside, Outside, All Around
- One solution doesn't fit all
  - Fuels
  - Drivetrains/Powertrains
  - Methods
- Cubing Out is a still a Thing
  - Not only Weigh Out
- Not just numbers
  - Quality of Life
  - Safety
- Global Warming is Global

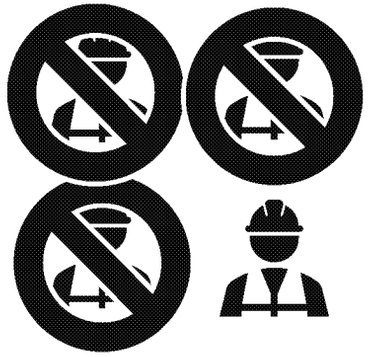
Low-Hanging Fruit

- Extending Truck Length
  - Frito Lay added 4-feet to box trucks and saved 25% on fuel
- Some ports aren't even using barcodes for tracking
- Dry Ice = Solid CO_2
  - Cold Chain
  - Battery Fast-charging
- Small Engines
  - Many 2-strokes (e.g., motorcycles, boats, etc.)
  - Often less well-maintained
  - Can be cheaper to replace than some other fossil-fueled transportation-related engines that emit less

Electrification = Automation = Job Loss ?



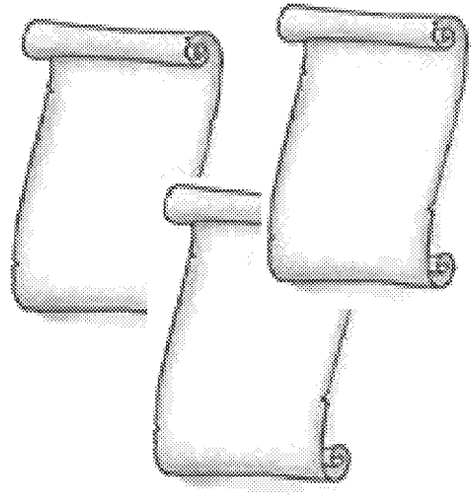


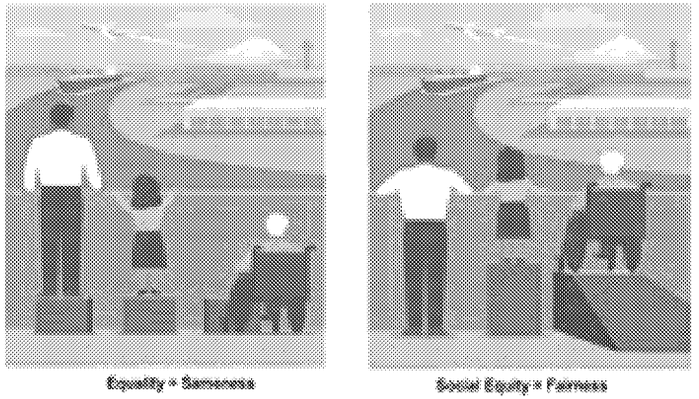


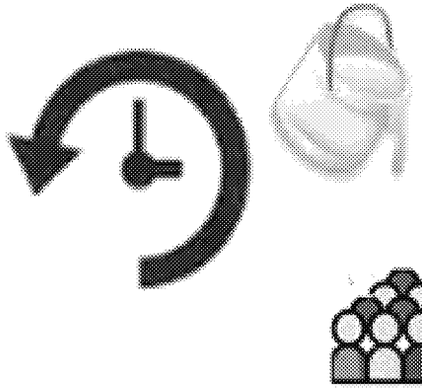
BLUEGREEN ALLIANCE®

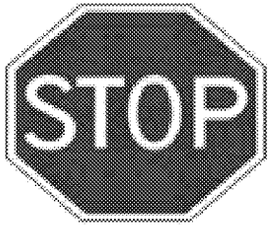
?

Transportation & Equity







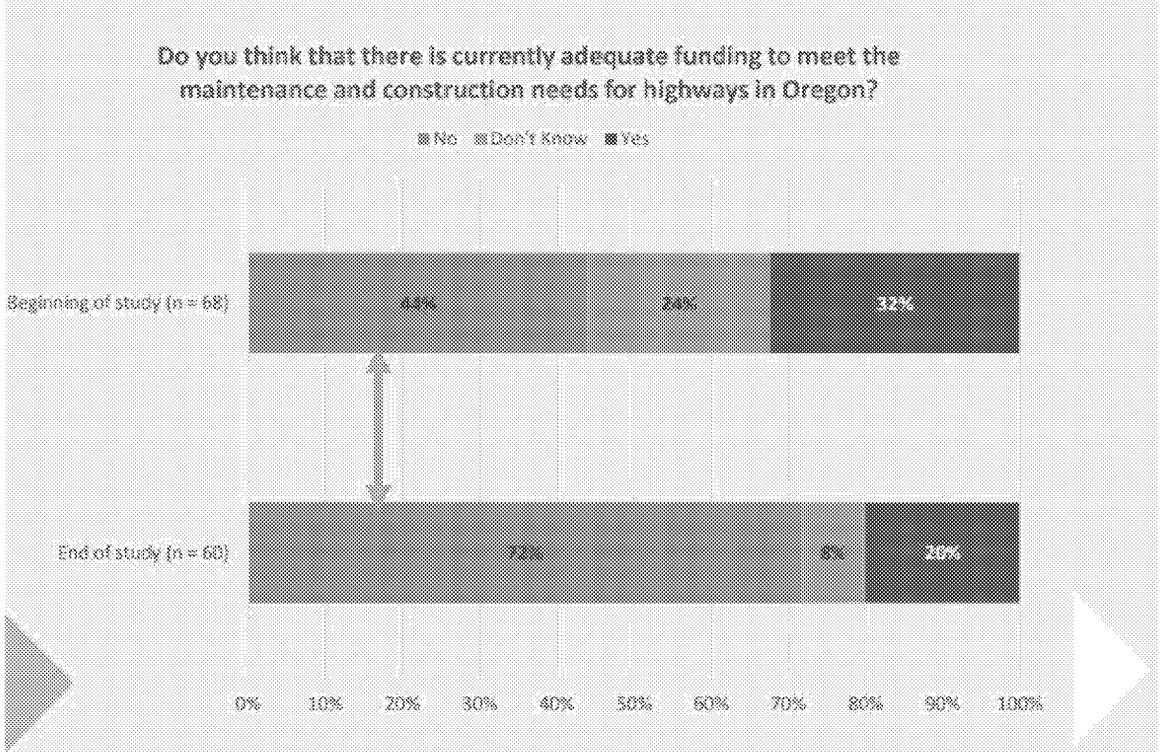


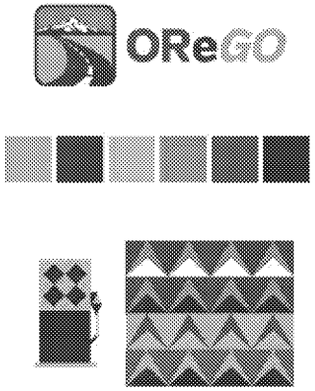
Gentrification/Displacement

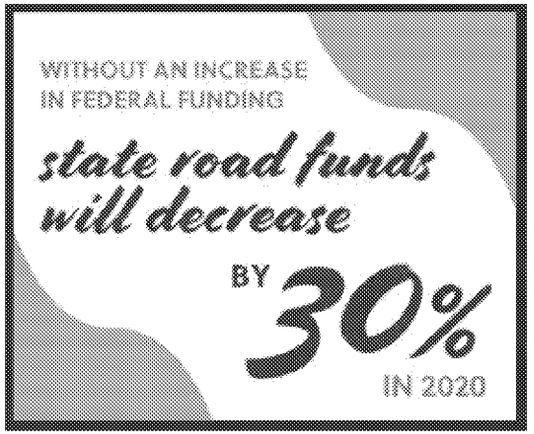
Sabrina Johnson

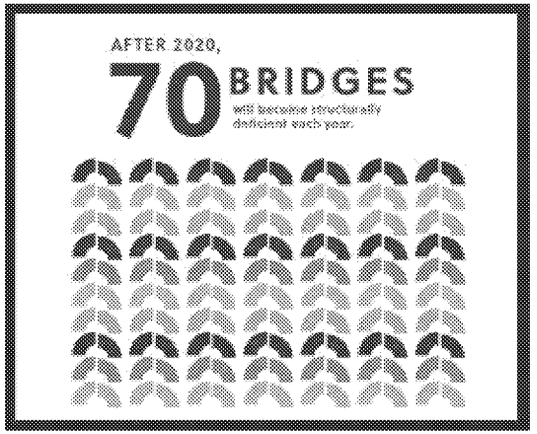
ORe*GO*

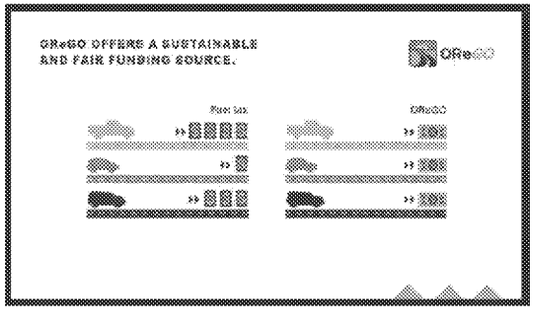
- Why transportation funding matters in their everyday lives.
- **Why decreasing fuel tax revenues are becoming a problem.**
- Why we need to solve it now and how delaying impacts Oregon's infrastructure.









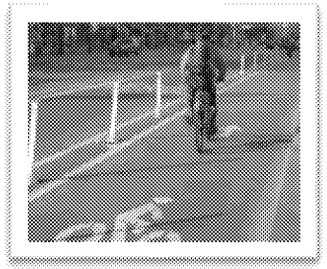


Ellen Wang
Communicating with John and Jane Q. Public About Transportation Funding - Session 1440

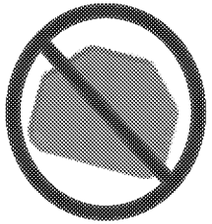
ED_006488A_00002367-00029

Hodge Podge of Nudges! (behavioral economics)

1. Fresh Start Effect – People are 4x more likely to try something new after they move (commute study)

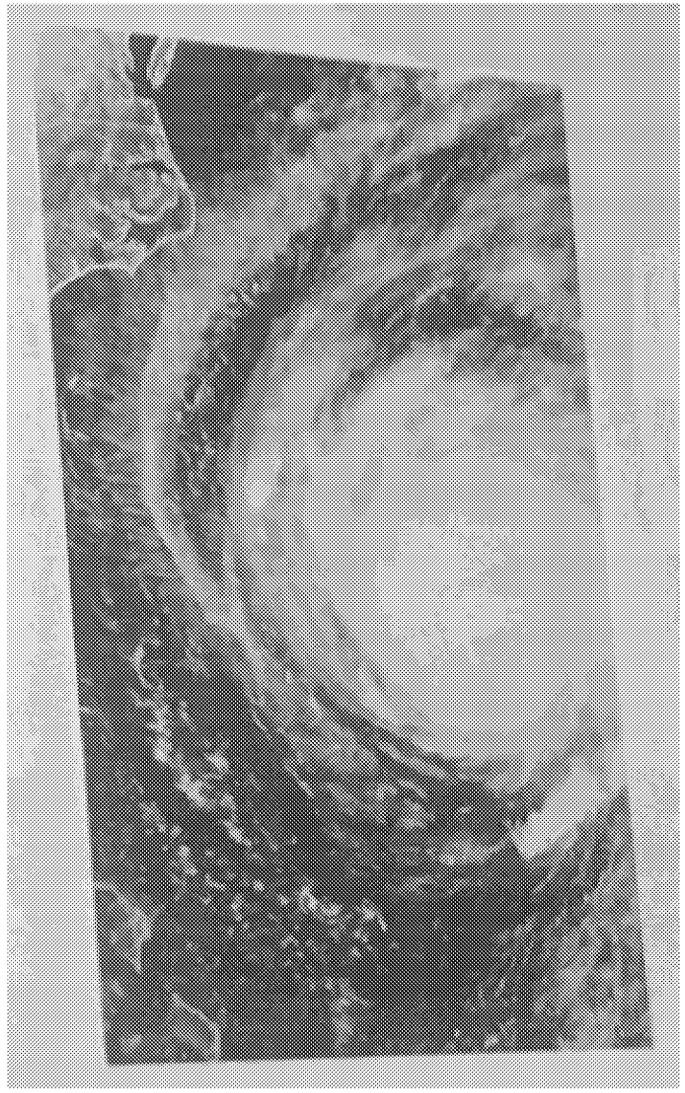


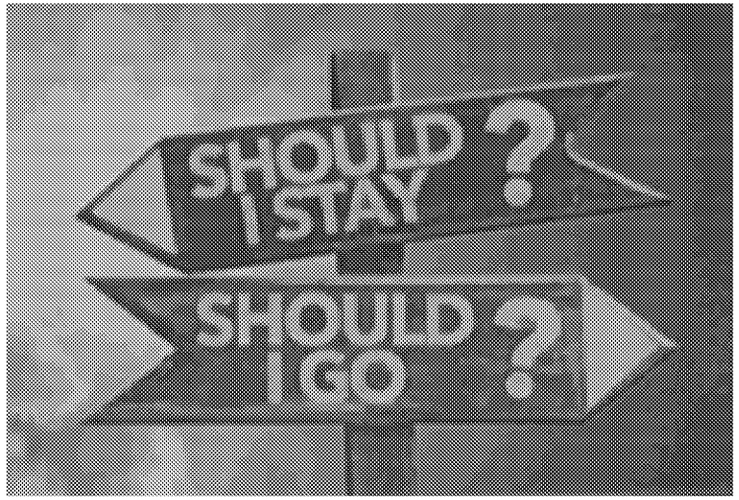
2. 40% reduction in food waste when trays were removed from college cafeterias

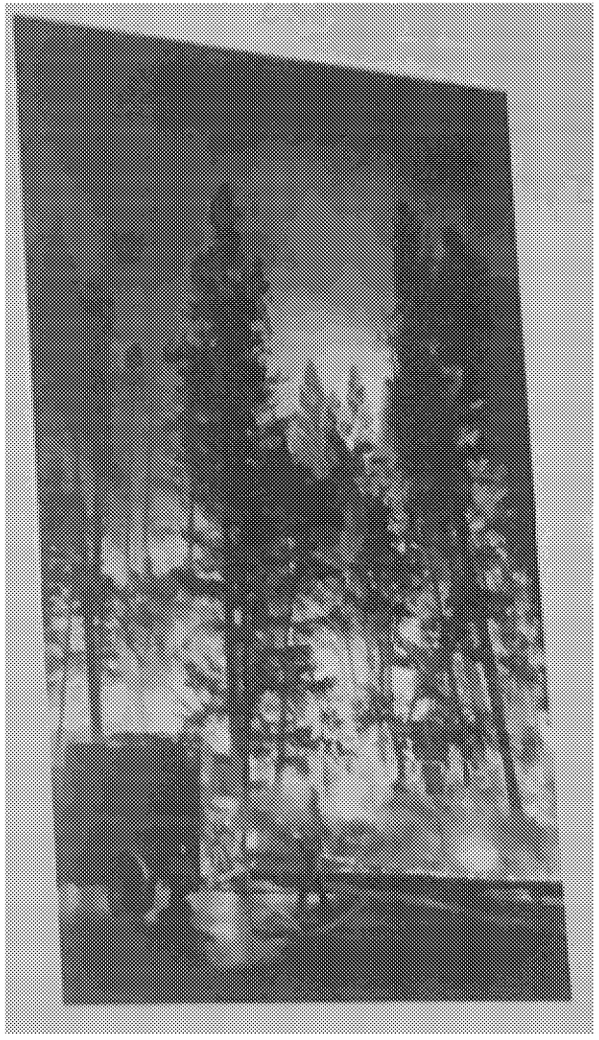


3. Hotel towels –
   - Enviro message
   - "People in this room reuse towels"

Kristin Kenausis
CASC







Transportation Resilience 2019:
Key Takeaways and Lessons Learned
Event 1657

Dennis Johnson

PROJECT DRAWDOWN

email sign up | donate

THE WORLD'S LEADING RESOURCE FOR CLIMATE SOLUTIONS.

View the solutions

ELECTRICITY GENERATION
- Biomass
- Cogeneration
- Concentrated Solar
- Energy Storage (Distributed)
- Energy Storage (Utilities)
- Geothermal
- Grid Flexibility
- In-Stream Hydro
- Methane Digesters (Large)
- Methane Digesters (Small)
- Micro Wind

FOOD
- Biochar
- Clean Cookstoves
- Composting
- Conservation Agriculture
- Farmland Irrigation
- Farmland Restoration
- Improved Rice Cultivation
- Managed Grazing
- Multistrata Agroforestry
- Nutrient Management
- Plant-Rich Diet
- Reduced Food Waste

BUILDINGS AND CITIES
- Bike Infrastructure
- Building Automation
- District Heating
- Green Roofs
- Heat Pumps
- Insulation
- Landfill Methane
- LED Lighting (Commercial)
- LED Lighting (Household)
- Net Zero Buildings
- Retrofitting
- Smart Glass

TRANSPORT
- Airplanes
- Cars
- Electric Bikes
- Electric Vehicles
- High-speed Rail
- Mass Transit
- Ridesharing
- Ships
- Telepresence
- Trains
- Trucks

COMING ATTRACTIONS
- A Cow Walks Onto A Beach
- Artificial Leaf
- Autonomous Vehicles
- Building With Wood
- Direct Air Capture
- Enhanced Weathering of Minerals
- Hydrogen-Boron Fusion
- Hyperloop
- Industrial Hemp
- Intensive Silvopasture
- Living Buildings

Rice Cultivation

New TRB Technical Activities Volunteer Structure

Sustainability and Resilience Group (AM000)

- *Section – Transportation and Society (AME00)*
- Equity in Transportation (AME10)
- Women's Issues in Transportation (AME20)
- Native American Transportation Issues (AME30)
- Transportation in the Developing Countries (AME40)
- Accessible Transportation and Mobility (AME50)
- Historic and Archeological Preservation in Transportation (AME60)
- Transportation and Public Health (AME70) (new*)
- Community Resources and Impacts (AME80) (new*)
- *Section - Transportation Systems Resilience (AMR00)*
- Transportation Infrastructure Protection and Preparedness (AMR10)
- Disaster Response, Recovery, and Business Continuity (AMR20)
- Transportation for National Defense (AMR30)
- Enterprise and Systems Resilience (AMR40) (new*)
- Natural Hazards and Extreme Weather Events AMR50) (new*)
- *Section - Transportation and Sustainability (AMS00)*
- Air Quality and Green House Gas Mitigation (AMS10)
- Resource Conservation and Recovery (AMS20)
- Transportation Energy (AMS30)
- Alternative Transportation Fuels and Technologies (AMS40)
- Transportation and Economic Development (AMS50)

Public Transportation Group (AP000)

- Transit Management and Performance (AP010)
- Transit Capacity and Quality of Service (AP015)
- Innovative Public Transportation Services and Technologies (AP020)
- Public Transportation Planning and Development (AP025)
- Public Transportation Marketing and Fare Policy (AP030)
- Passenger Intermodal Facilities (AP045)
- Bus Transit Systems (AP050)
- Rural, Intercity Bus, and Specialized Transportation (AP055)
- Rail Transit Systems (AP065)
- Light Rail Transit (AP075)
- Transit Safety and Security (AP080) (new*)
- Transformative Trends in Transit Data (AP090)

Freight Systems Group (AT000)

- Freight Transportation Economics and Regulation (AT010)
- Freight Transportation Planning and Logistics (AT015)
- International Trade and Transportation (AT020)
- Urban Freight Transportation (AT025)
- Agriculture and Food Transportation (AT030)
- Transportation of Hazardous Materials (AT040)
- Intermodal Freight Transport (AT045)
- Trucking Industry Research (AT060)

Rail Group (AR000)

- Passenger Rail Transportation (AR010)
- Rail Rolling Stock and Motive Power (AR020)
- Railroad Operating Technologies (AR030)
- Freight Rail Transportation (AR040)
- Railroad Infrastructure Design and Maintenance (AR050)
- Rail Transit Infrastructure Design and Maintenance (AR060)
- Rail Safety (AR070)
- Highway/Rail Grade Crossings (AR080)

Marine Group (AW000)

- Ports and Channels (AW010)
- Inland Water Transportation (AW020)
- Marine Environment (AW030)
- Marine Safety and Human Factors (AW040)
- Ferry Transportation (AW050)

Aviation Group (AV000)

- Intergovernmental Relations in Aviation (AV010)
- Aviation System Planning (AV020)
- Environmental Impacts of Aviation (AV030)
- Aviation Economics and Forecasting (AV040)
- Airport Terminals and Ground Access (AV050)
- Airfield and Airspace Capacity and Delay (AV060)
- Aircraft/Airport Compatibility (AV070)
- Aviation Security and Emergency Management (AV090)
- New Users of Shared Airspace (AV095) (new*)

Full list here

TRBAM 2020

PechaKucha (Japanese for "chit chat")

Q & A

ED_006488A_00002367-00034

TRBAM 2020

PechaKucha (Japanese for "chit chat")

Thanks!

ED_006488A_00002367-00035

Message

From: Bunker, Byron [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DDF7BCF023D241A9A477A2DC75D5901C-BUNKER, BYRON]
Sent: 9/27/2021 11:28:59 PM
To: Wright, DavidA [Wright.DavidA@epa.gov]; Zaremski, Sara [zaremski.sara@epa.gov]; Cullen, Daniel [cullen.daniel@epa.gov]
Subject: RE: Draft Preamble Language for BEV testing technical amendments
Attachments: Final Draft Preamble Testing with Updated Versions of SAE J1634 17 Sep 21 bjb.docx

Hi David,

Attached are my comments on these technical amendments. I do have several things that I would like to see changed as you will see in the comments. If you have any questions or want to discuss these, please just put time on my calendar for the four of us to discuss them.

Thanks,

Byron

****
Byron Bunker (pronouns – he/him/his)
Director Compliance Division
Office of Transportation and Air Quality
Environmental Protection Agency
2000 Traverwood Drive
Ann Arbor, MI 48105
Bunker.Byron@epa.gov
Phone: (734) 214-4155
Mobile: (734) 353-9623
****

From: Wright, DavidA <Wright.DavidA@epa.gov>
Sent: Monday, September 20, 2021 8:33 AM
To: Bunker, Byron <bunker.byron@epa.gov>; Zaremski, Sara <zaremski.sara@epa.gov>; Cullen, Daniel <Cullen.Daniel@epa.gov>
Subject: FW: Draft Preamble Language for BEV testing technical amendments

Please delete my previous note as I sent this to Amy, originally, and not Byron.

Regards,

David

From: Wright, DavidA
Sent: Monday, September 20, 2021 8:08 AM
To: Bunker, Amy <Bunker.Amy@epa.gov>; Zaremski, Sara <zaremski.sara@epa.gov>; Cullen, Daniel <cullen.daniel@epa.gov>
Subject: Draft Preamble Language for BEV testing technical amendments

David Wright *(pronouns: he/him/his)*
Light-Duty Vehicle Center – Compliance Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency

Message

From: Bunker, Byron [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DDF7BCF023D241A9A477A2DC75D5901C-BUNKER, BYRON]
Sent: 4/7/2019 3:22:39 PM
To: Grundler, Christopher [grundler.christopher@epa.gov]
Subject: RE: Updated 2014-17 Compliance Report
Attachments: compliance report draft 2019-04-05-new exec sum (003).pdf; compliance report 2014-2017 - briefing for AA.pdf

Hi Chris,

I hope you are enjoying a restful and sunny Sunday afternoon in Brussels. The two documents are attached as PDFs. I just quickly scanned, but it looks like they transferred without issue. If you see something funny in the formatting of the report you probably don't need to flag it. There is an art to getting Word to properly PDF long documents that the team will go through at the very end.

The briefing has a couple of key differences from the one we shared with you.
1) A little more explanation upfront for the purpose of the report (you know this, but good to tell Bill)
2) Tone that focuses more pointedly on our key messages as highlighted in the foreward, executive summary, and callouts in the report
3) Switch to maps to summarize audits and explanation for why different approaches for different segments
4) Rollout plan including distribution to manufacturers

The report makes extensive use of callouts to make clearer the message we are conveying with each section especially for the key messages of the report (compliance key to air quality, level playing field, we are everywhere, we are adapting our tools to find noncompliance, ensuring in-use controls including through recalls are key to maintaining existing fleet controls).

Thanks,

Byron

****
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From: Grundler, Christopher
Sent: Sunday, April 07, 2019 10:02 AM
To: Bunker, Byron <bunker.byron@epa.gov>
Subject: Re: Updated 2014-17 Compliance Report

Thx Byron

1. Can you send me just text version or pdf? I cannot read entire slide on my iPhone here in Brussels

2. Pls describe how you've changed report or briefing based on our meeting

Thanks

C

Christopher Grundler, Director
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On Apr 7, 2019, at 1:09 PM, Bunker, Byron <bunker.byron@epa.gov> wrote:

Hi Chris,

Attached are the updated draft of the 2014-17 Compliance Report and a draft briefing for Bill Wehrum with our rollout plan on the last slide. We are on Bill's calendar this coming Thursday looking to get his clearance on publishing the report the week of Earth Day.

Thanks,

Byron

****

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Forward by the Compliance Division Director

This report is the fifth in a series of vehicle and engine compliance reports issued by U.S. Environmental Protection Agency's Office of Transportation and Air Quality (EPA OTAQ). These reports provide a compendium of data that EPA OTAQ's Compliance Division collects as we work to help ensure that vehicles, engines, and other motorized equipment comply with emissions and fuel economy regulations. The environmental programs the Compliance Division implements apply to virtually every vehicle, engine, and gallon of transportation fuel sold in the United States. Previous reports cover the years 2007, 2008, 2009-2011, and 2012-2013, respectively.

This report covers the years 2014 - 2017. It focuses on a subset of the compliance data we collect in implementing EPA regulations designed to reduce and control vehicle and engine emissions of certain air pollutants that EPA regulates, such as nitrogen oxides, volatile organic compounds, and particulate matter. We include data about certificates issued, production volumes, defect reports and recalls for the various sectors of vehicles and engines.[1]

The Compliance Division has been busy in these years. In 2015, Volkswagen admitted to equipping U.S. diesel passenger cars dating back to the 2009 model year with software designed to circumvent the emissions control system – sacrificing pollution control for other features important to the company. The deceit involved software that detected when vehicles were undergoing emissions testing and directed full activation of emission controls only during the test. During normal vehicle operation, the software switched off emission controls, allowing the cars to emit nitrogen oxides at levels up to 40 times the standard.[2] This type of software is known as a "defeat device" because it defeats the purpose of the vehicles' emissions control systems.

As a result of the 2015 experience with Volkswagen, we decided to adapt and change our compliance programs to become less predictable. In September 2015, we announced that we would be keeping manufacturer vehicles longer and that our testing would include additional evaluations not disclosed to manufacturers. Since that time, we have screened more than 600 vehicles for potential defeat devices and have taken action as appropriate when the testing identified potential issues.

EPA takes deliberate acts to circumvent emissions regulations very seriously. Not only does cheating increase public exposure to harmful pollutants, it erodes trust in the regulated industry and EPA's compact with the public to protect people from harmful pollution. We expect manufacturers to produce vehicles and engines that serve a public good while meeting the spirit and letter of EPA regulations thereby protecting human health and the environment. We will continue to adapt our approaches to prevent cheating and to take appropriately strong action where we find it.

The Volkswagen case presented a clear violation of law, unusual in the depth and scope of cheating involved. But EPA's compliance program is also on alert to other forms of noncompliance which may stem from unintentional failures by manufacturers. In the 2014 – 2017 time period, we undertook several significant compliance and recall actions across a broad range of vehicle and engine sectors, as described in this report.

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[1] This report does not cover vehicle/engine fuel economy and greenhouse gas emissions compliance data, or transportation fuel quality/compliance programs as these are covered in other EPA publications -- see Section 1.1 for more information.

[2] More information can be found on EPA's website, at www.epa.gov/vw.

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EPA OTAQ is always looking at ways we can assess and improve manufacturer compliance throughout the life of the vehicles and engines produced. Given that vehicles and engines are manufactured all over the world, we engage with manufacturers all over the world. We send teams to manufacturing locations abroad to test vehicles and engines just as they are coming off the assembly line. We also partner with other federal agencies, such as U.S. Customs and Border Protection, to leverage their activities to inspect vehicles and engines at the point they're entering the U.S.

We've also improved the systems we use to collect and verify data from manufacturers. Disparate systems of data collection had evolved for the various vehicle and engine sectors, but as of 2015, EPA OTAQ consolidated them into one umbrella system, called "Engine and Vehicles – Compliance Information System," or EV-CIS. This comprehensive data management system facilitates issuance of certificates of conformity and allows vehicle and engine manufacturers to submit data efficiently and securely, while also allowing EPA to share emissions data with a broad range of partners and stakeholders. Indeed, much of the information presented in this report is accessible because of these expanded EV-CIS functionalities. EV-CIS is not just a secure means to store compliance data. It includes built-in validation of manufacturer and EPA data, thus helping to prevent data errors and even to identify potential noncompliant products.

In the U.S., we have seen tremendous improvement in air quality since the Clean Air Act Amendments of 1990, even while the U.S. economy, our collective vehicle miles travelled, and the number of vehicles and engines produced for the U.S. have significantly grown. Certainly, the Clean Air Act and EPA's regulations to implement it have created the framework for achieving these results.

But regulations are just the first part of the success story. As the Volkswagen case and other actions described in this report illustrate, the mere existence of regulations is not sufficient to reduce pollution. The environmental results promised by regulation can only be achieved if manufacturers are held accountable for fixing any defects when emissions problems show up after their products are in customer use.

That's why EPA is invested in compliance. We see our mission as two-fold: to deliver on the air quality promise of regulations, and to maintain a level playing field among manufacturers. EPA's role in helping to ensure compliance with regulations is key to our mission to limit pollution coming from vehicles and equipment that individuals and companies use every day – cars, trucks, construction equipment, agricultural machinery, recreational vehicles, lawn and garden equipment, and others – to ensure that even as we use these products, our air quality continues to be protected. New and improving technologies will enable the twin virtues of ever improving environmental and economic performance. Yet we know that manufacturers will not invest to develop new environmentally beneficial technologies to meet emissions compliance, if they see those investments undermined by competitors that cheat EPA regulations. Hence our actions to ensure a level playing field among manufacturers is key both to our present and future success in protecting the public from harmful emissions.

I hope through this report we can provide a window into our ongoing efforts to protect the public from harmful emissions while ensuring a level playing field among the regulated industry.

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Executive Summary

ES.1 Overview

This is the fifth in a series of vehicle and engine compliance reports issued by the U.S. Environmental Protection Agency's (EPA) Office of Transportation and Air Quality (EPA OTAQ).[3] These reports offer a convenient reference to the data that the EPA OTAQ Compliance Division collects in implementing emissions regulations for vehicles, engines, and other motorized equipment.

This report provides compliance data for vehicle and engine model years 2014 through 2017, and data related to testing, defects, and recalls in calendar years 2014 through 2017, for a variety of sectors encompassing onroad and off-road engines and vehicles. These include, for example, light-duty vehicles (i.e., passenger cars and passenger trucks), on-highway motorcycles, on-highway heavy-duty engines and trucks such as tractor-trailers and buses, nonroad engines such as construction and agricultural equipment, marine craft of all sizes, and locomotives.

ES.2 EPA OTAQ's Compliance Activities Ensure that EPA's Regulations Achieve the Result of Clean Air for Americans

Air quality in the U.S. has improved over the years, as regulations and technologies have affected emissions from all pollution sectors. However, there are areas across the country where air quality does not meet the National Ambient Air Quality Standards, and in many of these areas, mobile sources are the dominant contributor to emissions. EPA OTAQ's compliance program is key to ensuring that regulations for vehicles, engines, and other motorized equipment achieve the result of clean air.

ES.2.1 Air Quality Has Improved Overall

As described in the Air Quality Trends Report for 2016, nationally, concentrations of criteria and hazardous air pollutants have dropped significantly since 1990.[4] Concentrations of pollutants refer to the amount of a pollutant found in the air, as measured at an air quality monitor:

- Carbon monoxide (CO) 8-hour average, concentrations down 77%;
- Lead 3-month average, down 99%;
- Nitrogen dioxide (NO_2) annual average, down 56%;
- Nitrogen dioxide (NO_2) 1-hour average, down 50%;
- Ozone 8-hour average, down 22%;
- Particulate matter $\leq$ 10 microns (PM_{10}) 24-hour average, down 39%;
- Particulate matter $\leq$ 2.5 microns ($PM_{2.5}$) annual average, down 42%;
- $PM_{2.5}$ 24-hour average, down 44%;

[3] EPA's previous vehicle and engine compliance reports can be found on EPA's webpage at www.epa.gov/vehicle-and-engine-certification/compliance-activity-reports-vehicles-and-engines.

[4] EPA's National Air Quality Trends Report for 2016, found on EPA's web page at: www.epa.gov/air-trends.

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- Sulfur dioxide (SO_2) 1-hour average, down 85%; and
- Air toxics, down by percentages varying by specific pollutant.

Decreases in pollutant concentrations measured at air quality monitors indicate that EPA's air pollution control programs are collectively achieving the goal of improving air quality.

Decreases in annual emissions estimates are also an indicator of the overall effectiveness of EPA's air pollution control programs. Annual emissions estimates describe the total amount of a pollutant that is emitted or released over the course of a year from all sources, such as power plants, industrial facilities, onroad vehicles, off-road vehicles, and other local area sources.

According to EPA's Air Quality Trends Report, between 1980 and 2016, the U.S. economy continued to grow, the number of vehicle miles travelled in the U.S. continued to grow, and population and energy use also increased, as seen in Figure ES-0-1. During the same time period, total emissions of six principal air pollutants dropped by 67 percent.[5,6]

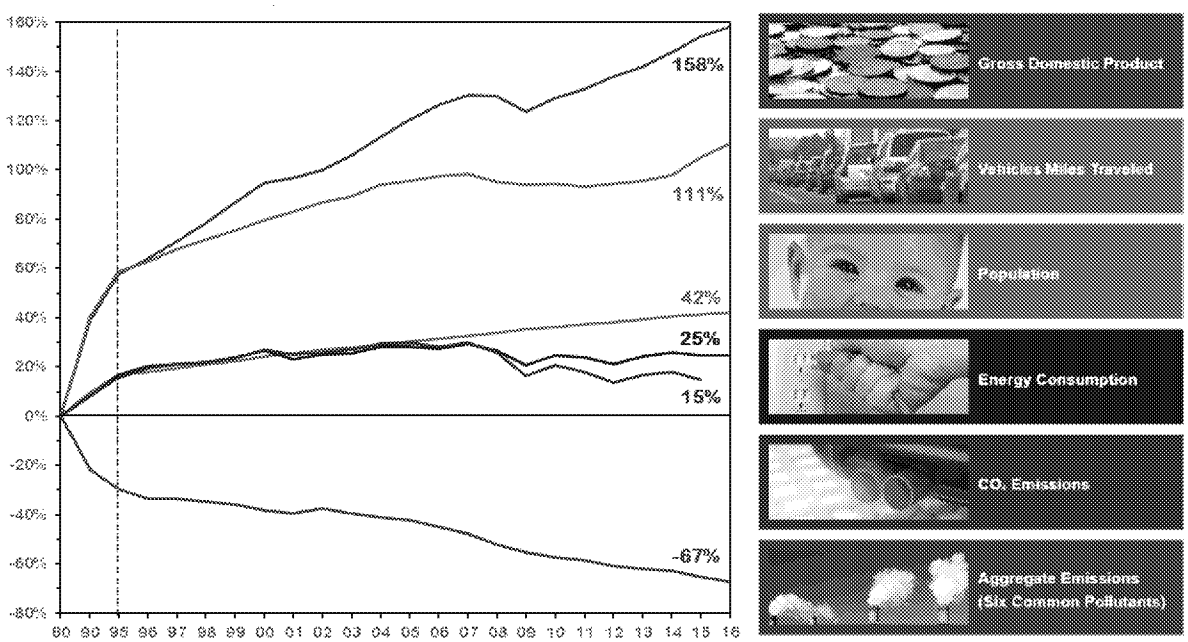

Figure ES-0-1: Comparison of Growth Areas and Emissions, 1980 - 2016[7]

[5] The six pollutants included are: carbon monoxide (CO), nitrogen oxides (NO_x), particulate matter of diameter less than or equal to 10 microns, and less than or equal to 2.5 microns (PM_{10} and $PM_{2.5}$), volatile organic compounds (VOC), sulfur dioxide (SO_2), and ammonia (NH_3).

[6] We expressly note that vehicle emissions of carbon dioxide and other greenhouse gases have increased during this period and are the fastest-growing source of greenhouse gas emissions in the United States. The first EPA regulations controlling carbon dioxide as a pollutant took effect with 2012 model year cars. Please see EPA's 2018 Annual Report at www.epa.gov/automotive-trends for light-duty vehicle greenhouse gas data.

[7] EPA's National Air Quality Trends Report for 2016, found on EPA's web page at: www.epa.gov/air-trends.

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ES.2.2 Areas Across the County Have Air Quality Not Meeting the National Ambient Air Quality Standards, and Mobile Sources Are a Significant Contributor

While emissions of pollutants have been declining, there are still millions of people across the country breathing pollution at levels above the National Ambient Air Quality Standards.[8] Mobile sources are significant contributors to total national emissions, accounting for more than half of the NOx and CO emissions nationwide (NOx is necessary for ozone, more commonly known as smog, formation). However, mobile sources are the dominant emissions sources in many individual urban areas. In addition, mobile sources contribute to higher localized levels of pollutants near roads and transportation facilities. More than 45 million people in the United States live, work, or attend school within 300 feet of a major road, airport, or railroad. Individually and in combination, many of the pollutants found near roadways have been associated with adverse health effects.[9] Onroad and nonroad vehicles and engines are used by people as they go about their daily lives – at work, at home, in transit, and in recreation.

Mobile sources, which include onroad vehicles and offroad vehicles and equipment, are the dominant emissions sources in many individual urban areas.

These facts emphasize the importance of EPA's transportation-related air quality programs.

ES.2.3 EPA's Compliance Activities Are Necessary to Ensure Regulations Deliver Clean Air

EPA derives authority to regulate vehicles, fuels, and engines through a variety of environmental statutes enacted by Congress. The Clean Air Act, as well as the Energy Policy and Conservation Act, the Energy Policy Act, and Energy Independence and Security Act give EPA the authority to regulate nearly all engines and vehicles that emit pollutants into the environment. These statutes also give EPA the authority to regulate the fuels that power these mobile sources, and the responsibility for emissions compliance oversight that extends from initial product design to performance on the road and in the field.

EPA's compliance activities confirm that vehicle and engine manufacturers are satisfying their regulatory obligations.

All mobile source sectors contribute to the national inventory of emissions, and EPA OTAQ's compliance programs cover these different sectors, as described in this report. Compliance programs play an essential role in achieving the benefits of statutes and regulations. EPA OTAQ oversees a comprehensive set of compliance activities to confirm that vehicle and engine

[8] See www.epa.gov/airquality/greenbook/popexp.html. EPA sets National Ambient Air Quality Standards for the pollutants ozone, carbon monoxide (CO), particulate matter of diameter less than or equal to 10 microns (PM_{10}), particulate matter of diameter less than or equal to 2.5 microns ($PM_{2.5}$), nitrogen dioxide (NO_2), lead, and SO_2. Ozone is not directly emitted, but forms in the atmosphere from volatile organic compounds (VOCs) and nitrogen oxides (NOx). For more information, see EPA's web page at www.epa.gov/criteria-air-pollutants.

[9] More information is available at: www.epa.gov/air-research/near-roadway-air-pollution-and-health-frequent-questions

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manufacturers and fuel refiners and producers are satisfying their regulatory obligations.

The data we collect, and present in this report, provide the foundation of our compliance assessments. Under EPA's Tier 2 and Tier 3 programs, for example, light-duty vehicles, including SUVs and other light-duty trucks, must meet a fleet average standard. Compliance data show that manufacturers are meeting their regulatory targets: in model year 2017, 99 percent of the vehicle test groups were certified to Tier 2 Bin 5 or better (see Sections 2.5.1 and 3.9 for more information). Light-duty vehicle manufacturers are achieving better emissions control than the standards by compliance margins of more than 50 percent, for pollutants NOx, NMOG, and CO.

ES.3 EPA's Compliance Activities Are Diverse and Tailored to Different Industries

The industries included in this report differ significantly, in terms of numbers of manufacturers, complexity of the vehicles and engines they build, and the emissions standards and regulatory requirements on those products. Some sectors are more consolidated than others. For example, there are a larger number of highway motorcycle manufacturers (more than 100) obtaining certificates for fewer than 300 engine families each year, compared to the light-duty vehicle sector, where 36 vehicle manufacturers obtained certificates for more than 500 unique exhaust test group/evaporative families. The small spark ignition engine sector, which includes products such as lawn and garden equipment for residential use, has the largest number of engine families, as 900 or more were certified in each of these model years.

EPA's compliance activities also vary and are tailored to the differences in these industries. One example is defect and recall reporting. Manufacturers in all regulated sectors are required to report emission-related defects to EPA. An emission-related defect is a defect in design, materials or workmanship in a device, system or assembly, as described in the approved application for certification. EPA regulations generally establish minimum numbers of confirmed defects that trigger defect information reporting requirements. An emission-related defect can lead to a recall, but this does not happen in every case because some defects in emission-related parts do not increase emissions. Under the Clean Air Act, if EPA determines that a substantial number of vehicles or engines in a category or class do not meet emission standards in actual use, even though they are properly maintained and used, EPA can require the manufacturer to recall and fix the affected vehicles and engines.

Recall programs protect air quality by holding manufacturers responsible for fixing defects in their products at no cost to consumers.

Over calendar years 2014 – 2017, the defect and recall programs have affected millions of vehicles and engines currently in use. Table 0-1 shows recall reports and affected vehicles or engines by sector. A vehicle or engine may be subject to multiple recalls, and therefore the same vehicle or engine may be included more than once in the "Affected Vehicles" count.

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Table 0-1: Recall Reports and Affected Vehicles/Engines by Regulated Sector, 2014 - 2017

Regulated Sector	2014		2015		2016		2017	
	Recalls	Affected Vehicles	Recalls	Affected Vehicles	Recalls	Affected Vehicles	Recalls	Affected Vehicles
Light-Duty Vehicles	44	9,006,273	64	4,191,581	65	5,969,283	86	4,937,955
Highway Motorcycles	0	0	2	1,050	3	23,931	2	8,179
Heavy-Duty Highway Engines	12	149,392	6	338,453	9	755,553	6	41,752
Nonroad Spark Ignition Engines	2	21,502	0	0	3	9,362	3	4,171
Recreational Vehicles	2	20,016	1	244	1	800	5	90,551

As seen in Table 0-1, the number of defects and recalls reported light-duty vehicles is greater than any other industry sector. Because of the factors that make the light-duty sector unique, defect and recall reporting are critical components of compliance for this sector. Light-duty emission standards are the most stringent of any sector and light-duty vehicles have the most sophisticated and complex emission control systems, including on-board diagnostic systems, that are integrated with other computer-controlled systems within a vehicle. Given this greater complexity, there is a greater opportunity for defects to occur. In addition, the light-duty vehicle sector has existing infrastructure, in the form of dealerships, that facilitates conveying information about defects and recalls to consumers, as well as implementing recalls and servicing vehicles. For these reasons, defect and recall reporting are critical light-duty compliance tools.

For other sectors, such as heavy-duty highway engines, nonroad spark ignition engines, recreational vehicles, and highway motorcycles, compliance audits conducted in the field play a greater role in how EPA assesses compliance. For these industry sectors, an essential part of EPA OTAQ's compliance programs is the ability to inspect products and emission measurement processes in the field to validate that the regulated sectors comply with applicable emission standards. EPA OTAQ has a variety of field inspections tools that serve to validate the different facets of compliance, and because manufacturing occurs across the globe, EPA's compliance audits do as well.

From calendar year 2014 to 2017, EPA OTAQ conducted 91 compliance audits across a variety of regulated sectors on several continents, including North America, Europe, and Asia, as shown on the maps below. In its audits, EPA found issues such as problematic emissions measurement software, noncompliant calibration and testing practices, missing records, use of test fuel that did not meet specifications, and others.

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Of these compliance audits, 16 were Selective Enforcement Audits (SEAs). For SEAs, a formal pass/fail determination is made at the end of the audit, based on the emission test results of the sampled products. In the period from 2014-2017, EPA suspended one SEA that began in 2013 and the manufacturer agreed to recall its products voluntarily. There were no failed audits among the 16 SEAs conducted from 2014-2017; however, there were testing and laboratory issues that manufacturers were required to correct.

EPA's world-wide compliance audits promote a level playing field among manufacturers.

Locations of compliance audits are marked with a pin on the maps in Figures ES-2 through ES-4 below. A yellow or red shadow under a pin indicates multiple audits in that area. The darker the shadow, the greater the number of audits in that location. For example, in Southern California, 14 audits occurred in the 2014 – 2017 timeframe.

EPA will continue to use its diverse and targeted compliance tools as statutes and regulations provide, to use its resources appropriately and efficiently to assess compliance of manufacturers in all industry sectors.

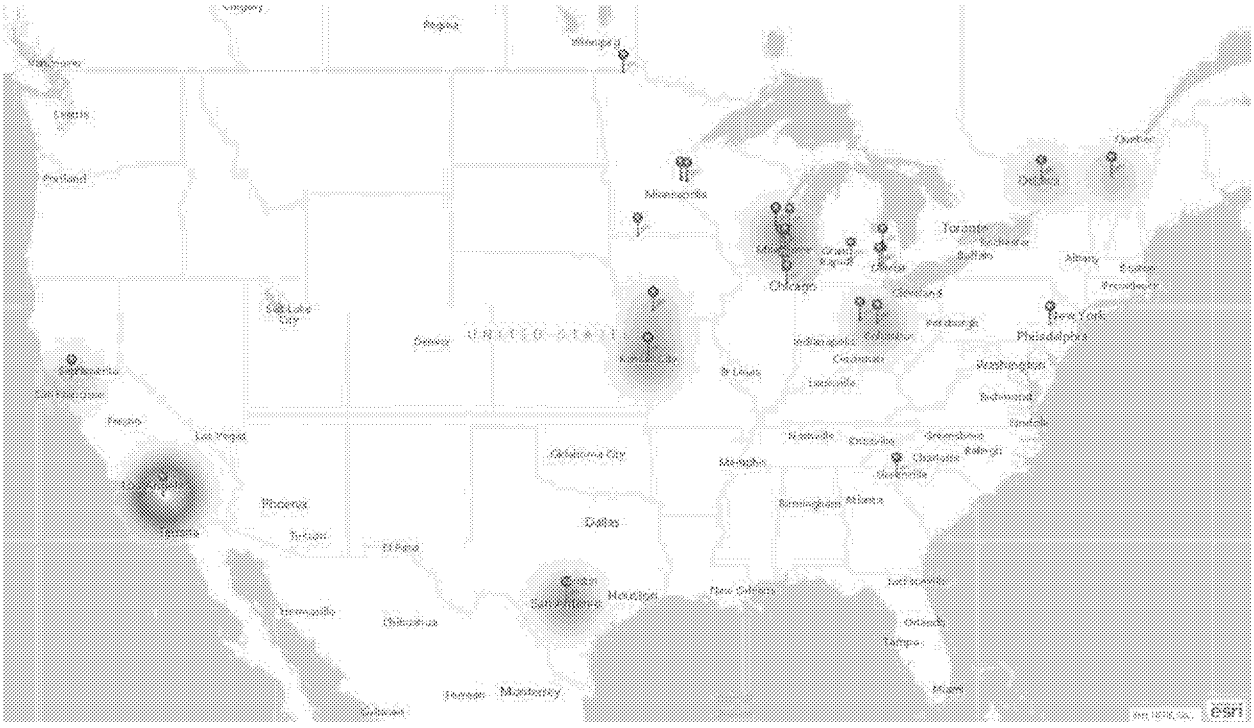

Figure 0-2: EPA OTAQ Compliance Audit Locations in North America, 2014 -2017

Figure 0-3: EPA OTAQ Compliance Audits in Europe, 2014 - 2017

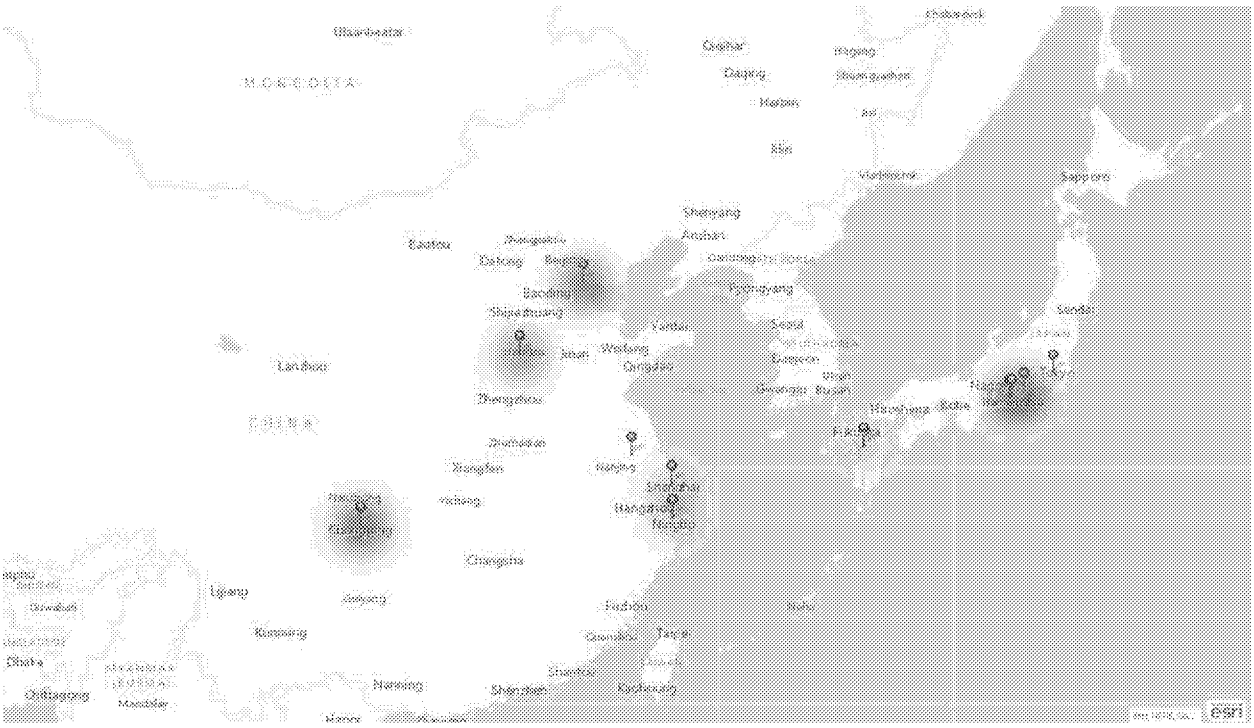

Figure 0-4: EPA OTAQ Compliance Audits in Asia, 2014 - 2017

ES.4 EPA Continuously Considers Ways to Improve Compliance and Oversight Programs as Industries Grow and Technologies Change

As described throughout this report, EPA employs a rigorous, multi-layer process to test and certify new vehicle models before they can be sold, and for testing vehicles and engines that are in production and on the road. As technologies evolve and circumstances change, EPA continuously considers ways to improve compliance and oversight programs. Over the past 45 years, EPA's oversight and testing program has developed new tools and new techniques to adapt to technology advances, so that we achieve the agency's mission of protecting public health and the environment. EPA OTAQ intends to continue to adapt its compliance oversight to be both efficient and unpredictable.

This compliance report covers model years 2014-2017 as well as compliance actions taken in calendar years 2014-2017. During this time, EPA OTAQ learned that Volkswagen equipped their model year 2009 – 2016 diesel passenger vehicles with software that enabled cars to pass emissions tests, but exceed pollution standards during normal vehicle operation. See Section 2.6 of this report for more information. The Volkswagen defeat device case reinforces the need for EPA's active and visible presence in monitoring compliance with emissions standards.

Reinforcing this need is the ever-growing number and diversity of vehicles, engines, and products developed by industry that must receive a Certificate of Conformity. The Clean Air Act requires each vehicle and engine to have a Certificate of Conformity, which is a license to produce products for one model year consistent with the vehicle description and any terms of the certificate. The number of certificates that EPA issues continues to grow. For model year 2017, EPA issued close to 5000 certificates. For comparison, for model year 1995, EPA issued 810.

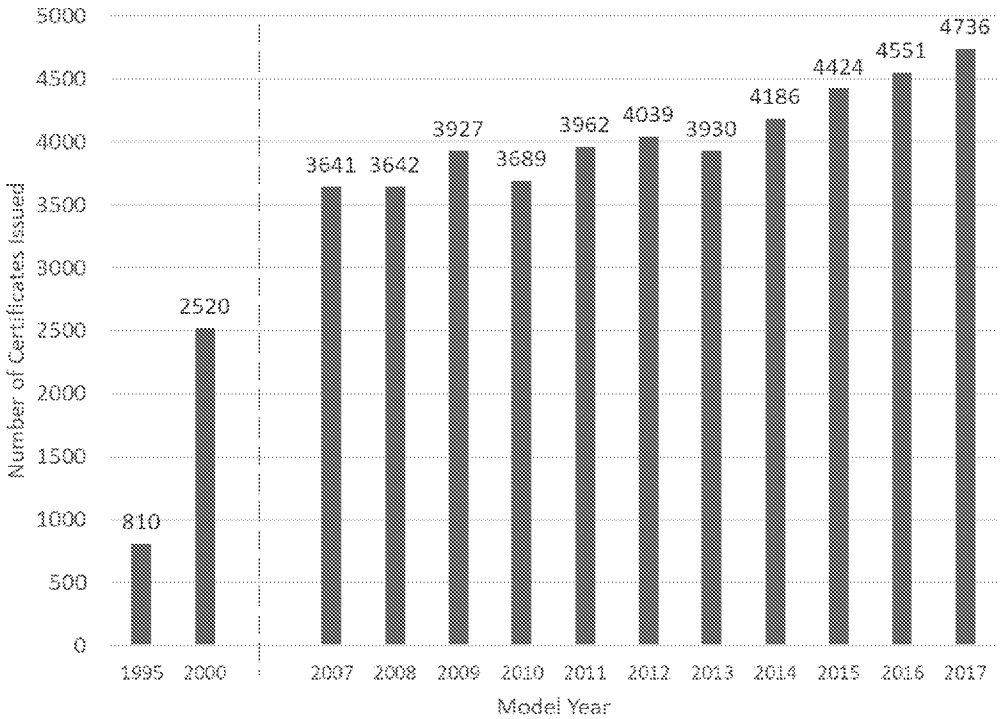

Figure ES-0-5: Total Number of Certificates Issued in Model Years Since 1995

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Numbers of certificates in some sectors have remained relatively stable, but there have been substantial changes in many sectors. For example, certificates for the category of "forklifts, generators, and compressors" has increased by more than five times. Also, new categories of certificates have been added to EPA's list. Recent ones include certificates for alternative fuel conversions, for both light-duty and heavy-duty vehicles; evaporative components for nonroad spark ignition engines; and heavy-duty tractors and vocational vehicles.

EPA OTAQ recognizes the need to adapt and change compliance programs to become less predictable. In September 2015, we announced that we would be keeping manufacturer vehicles longer and that our testing would include additional evaluations not disclosed to manufacturers. Since that time, EPA OTAQ has screened more than 600 vehicles for potential defeat devices and has taken action as appropriate when the testing identified potential issues. EPA has reinvented a "3 x 3" approach to vehicle testing, in which we test cares at three times in their lifecycle (preproduction, production, and in-use) using three test methods.

EPA OTAQ has also improved the systems we use to collect and verify data from manufacturers. Disparate systems of data collection had evolved for the various vehicle and engine sectors, but as of 2015, EPA OTAQ consolidated them into one umbrella system, called "Engine and Vehicles – Compliance Information System," or EV-CIS. This comprehensive data management system facilitates issuance of certificates of conformity and allows vehicle and engine manufacturers to submit data efficiently and securely, while also allowing EPA to share emissions data with a broad range of partners and stakeholders. EV-CIS includes built-in validation of manufacturer and EPA data, thus helping to prevent data errors and even to identify potential noncompliant products.

EPA remains committed to developing compliance tools, tests, and methods that are unpredictable and that employ efficiencies to keep pace with the ever changing and growing industry sectors. Compliance is vital to ensure that Americans continue to breathe clean air and have confidence that the products manufactured for sale in the U.S. meet the standards.

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1. Introduction

1.1 Organization of this Report

This is the fifth in a series of vehicle and engine compliance reports issued by the U.S. Environmental Protection Agency's (EPA) Office of Transportation and Air Quality (EPA OTAQ). These reports offer a convenient reference to the data that EPA OTAQ collects in implementing emissions regulations for vehicles, engines, and other motorized equipment. For more information, refer to Table 1-2 later in this section.

This report provides compliance data for vehicle and engine model years 2014 through 2017, and data related to testing, defects, and recalls in calendar years 2014 through 2017, for a variety of sectors encompassing onroad and off-road engines and vehicles. These include light-duty vehicles (i.e., passenger cars and passenger trucks), on-highway motorcycles, on-highway heavy-duty engines and trucks such as tractor-trailers and buses, nonroad engines such as construction and agricultural equipment, marine craft of all sizes, and locomotives.

The report is organized as follows:

- Section 1, Introduction. This section provides the context for EPA's compliance programs, including the statutory authority for these programs, the regulations that apply, and recent air quality trends.

- Section 2, Overview of Compliance Programs and Processes. This section describes generally the programs and processes EPA employs to ensure that vehicles and engines comply with emissions standards over their full lifecycle.

- Sections 3 - 8: Compliance Data by Sector. These sections provide compliance data, production volumes for the U.S., and other information, organized by industry sector:
  - Section 3: Light-Duty Vehicles
  - Section 4: Highway Motorcycles
  - Section 5: Heavy-Duty Highway Engines
  - Section 6: Nonroad Compression Ignition Engines
  - Section 7: Nonroad Spark Ignition Engines
  - Section 8: Recreational Vehicles

  Table 1-1 provides examples of the types of vehicles and engines included in each sector.

- Section 9: Alternative Fuels and Alternative Fuel Conversions. This section provides details about alternative fuel use among the different industry sectors.

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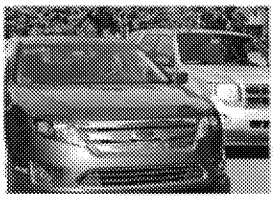
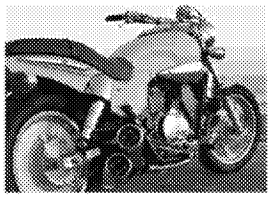
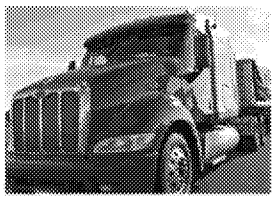
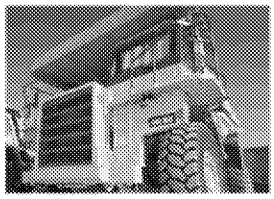
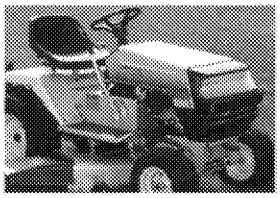
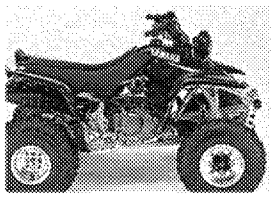
Table 1-1: Industry Sectors and Examples

Industry Sector	Examples	Key
Light-Duty Vehicles	Passenger cars, vans, SUVs, small trucks	
Highway Motorcycles	On-highway motorcycles, cruisers, choppers, scooters, touring bikes, mopeds, street bikes	
Heavy-Duty Highway Engines	Tractor-trailers (semi-trucks), buses, delivery and work trucks	
Nonroad Compression Ignition Engines (Nonroad CI)	Construction and agricultural equipment, such as tractors, generators, construction and road-work equipment, welders	
	Marine diesel boats and ships, oceangoing vessels	
	Locomotives	
Nonroad Spark Ignition Engines (Nonroad SI)	Small SI: lawnmowers, string trimmers, chain saws, small compressors, pumps, snow blowers	
	Marine SI: inboard and outboard motorboats, jet-skis	
	Large SI: forklifts, large compressors, generators	
	Evaporative components: hoses, fuel tanks	
Recreational Vehicles	All-terrain vehicles (ATVs), utility vehicles (UTVs), sand cars, dune buggies, go karts	
	Off-highway motorcycles	
	Snowmobiles	

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This report does not cover transportation fuel quality/compliance programs or vehicle/engine fuel economy and greenhouse gas emissions compliance data. More information on these programs, as well as other EPA references, can be found on EPA's webpages as listed in Table 1-2.

Table 1-2: EPA References

Information	Web Address
Fuel compliance information, including EPA analyses of data	www.epa.gov/fuels-registration-reporting-and-compliance-help
Gasoline standards	www.epa.gov/gasoline-standards
Diesel fuel standards	www.epa.gov/diesel-fuel-standards
Light-duty vehicle carbon dioxide and fuel economy trends	www.epa.gov/fuel-economy-trends/explore-co2-and-fuel-economy-trends-data
EPA's online Emission Standards Reference Guide (comprehensive list of EPA mobile source emission standards)	www.epa.gov/otaq/standards/index.htm
Comprehensive list of regulations for emissions from vehicles and engines	www.epa.gov/regulations-emissions-vehicles-and-engines
Previous vehicle and engine compliance reports	www.epa.gov/vehicle-and-engine-certification/compliance-activity-reports-vehicles-and-engines

1.2 Statutory Authority

EPA derives authority to regulate vehicles, fuels, and engines through a variety of environmental statutes enacted by Congress. Table 1-2 outlines the primary environmental statutes that give EPA the authority to develop and implement its mobile source clean air programs.

Table 1-3: Environmental Statutes

Statute	Authority
Clean Air Act (CAA)	Emission standards for highway & nonroad vehicles and their fuels
Energy Policy and Conservation Act (EPCA)	Fuel economy information programs for consumers, including vehicle fuel economy labels
Energy Policy Act (EPAct) Energy Independence and Security Act (EISA)	Annual volume standards for renewable fuel content

These statutes give EPA the authority to regulate nearly all engines and vehicles that emit pollutants into the environment, authority to regulate the fuels that power these mobile sources, and responsibility for emissions compliance oversight that extends from initial product design to performance on the road and in the field.

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1.3 Scope of EPA Vehicle, Engine, and Equipment Regulations

Compliance programs play an essential role in achieving the benefits of statutes and regulations. EPA oversees a comprehensive set of compliance activities to ensure that vehicle and engine manufacturers and fuel refiners and producers satisfy their regulatory obligations.

Compliance programs play an essential role in ensuring the public receives the benefits of clean air.

EPA regulation of motor vehicles began in the 1970s. Table 1-3 lists vehicle and engine regulations that apply to model years 2004 and later. This table is meant to be an overview of the regulations that currently apply to the various sectors covered in this report, but it does not include every regulation. For a comprehensive list of EPA vehicle and engine emission standards, refer to EPA's online Emission Standards Reference Guide, available at www.epa.gov/otaq/standards/index.htm, and see the comprehensive list of regulations for emissions from vehicles and engines at www.epa.gov/regulations-emissions-vehicles-and-engines.

As Table 1-3 illustrates, over time, EPA has added regulations to previously unregulated mobile source sectors and has improved regulations in other sectors to strengthen their efficacy.

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Table 1-4: Vehicle and Engine Regulations and Implementation Dates

Affected Industry Sector/Category	Program/Rulemaking Description	Effective Model Year[10]
Light-Duty Vehicles	Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards Phase 2 – Established emission standards for greenhouse gases including carbon dioxide, methane, and nitrous oxide	2017 - 2025
	Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards Phase 1 – First mobile source emission standards for greenhouse gases including carbon dioxide, methane, and nitrous oxide	2012-2016
	Control of Air Pollution from Motor Vehicles: Tier 3 Motor Vehicle Emission and Fuel Standards – Established new vehicle emission standards and further lowered the sulfur content of gasoline	2014
	Tier 2 Motor Vehicle Emission and Fuel Standards – Treated vehicles and fuels as a system by concurrently regulating gasoline sulfur content to enable use of vehicle aftertreatment technology that would significantly reduce exhaust emissions	2004
	Revisions and Additions to Motor Vehicle Fuel Economy Label – Redesigned label to provide the public with information on vehicles' fuel economy, energy use, fuel costs, and environmental impacts, allowing comparisons between conventional and advanced technology vehicles such as electric vehicles and plug-in hybrid electric vehicles.	2013
	Revisions to Motor Vehicle Fuel Economy Labeling – Revised the method for determining fuel economy label values to better represent typical driving patterns and more accurately estimate actual consumer fuel economy	2008
	Clean Alternative Fuel Vehicle and Engine Conversions – Provided additional compliance options for manufacturers of clean alternative fuel conversion systems for highway vehicles and engines	All[11]
	Mobile Source Air Toxics – Set standards to lower gasoline benzene content, reduce cold temperature exhaust emissions,	2010

[10] Effective model year refers to the first year of a new program where only one year is noted. Many programs are phased in over multiple model years.

[11] Although this regulation took effect with its promulgation in 2011, it relates to clean alternative fuel conversion systems that can apply to any model year that is subject to any emission standard.

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	and reduce evaporation and permeation from portable fuel containers Mobile Source Air Toxics – First regulation identifying compounds that should be considered mobile source air toxics and required refiners beginning in 2002 to maintain their average 1998-2000 gasoline toxic emission performance levels	2002
Highway Motorcycles	Greenhouse Gas Reporting Program – Required reporting of greenhouse gas emissions from all sectors of the economy	2011
	Highway Motorcycle Permeation Emissions – Established new evaporative/permeation standards for fuel tank(s) and lines	2008
	Highway Motorcycle Exhaust Emissions – Established emissions standards for exhaust and evaporative emissions for motorcycles, updating standards that were more than 20 years old. Included previously unregulated motorcycles with engines of <50 cc (scooters and mopeds)	2010 and 2006[12]
Heavy-Duty Highway Engines and Vehicles	Heavy-Duty GHG and Fuel Efficiency Standards Phase 2 – Established vehicle and engine performance standards for model years 2021-2027 for semi-trucks, large pickup trucks, vans, and all types and sizes of buses and work trucks; and model years 2018-2027 for certain trailers Heavy-Duty GHG Standards – Established the first emission standards for greenhouse gas pollutants from heavy-duty engines and vehicles for model years 2014 -2018	2021 2018 2014
	Standard for diesel fluid systems – Established minimum maintenance intervals for replenishment of diesel exhaust fluid with the use of selective catalytic reduction technologies	2014
	Nonconformance Penalties for On-Highway Heavy-Duty Diesel Engines – Established fines for manufacturers that are not meeting standards	2012
	Onboard Diagnostic (OBD) Systems – New OBD requirement for engines over 14,000 pounds; revisions to OBD for engines under 14,000 pounds Light Heavy-Duty OBD – Established OBD monitoring requirements for heavy-duty chassis certified vehicles, and for engines certified for use in heavy-duty vehicles between 8,500 and 14,000 pounds gross vehicle weight rating (GVWR)	2010 2004
	Heavy-Duty Highway Rule – Established more stringent exhaust emission standards for heavy-duty vehicles and engines; required Ultra Low Sulfur Diesel (ULSD) fuel (15 ppm sulfur maximum)	2007

[12] New highway motorcycle standards applied in 2006; more stringent standards applied to Class III motorcycles (engine size ≥280 cc) in 2010.

Nonroad Compression Ignition Engines & Equipment	Construction & Agricultural	Greenhouse Gas Reporting Program – Required reporting of greenhouse gas emissions from all sectors of the economy	2011
		Tier 4 Nonroad Diesel Rule – Established more stringent emissions standards for all engines greater than 19 kilowatts (25 hp) and lowered nonroad diesel fuel sulfur to 15 ppm maximum Tier 3/Interim Tier 4 – Established more stringent emission standards for engines between 37 and 560 kilowatts (50 and 750 hp)	2010 2006
	Marine Diesel Engines	Standards for New Marine Compression-Ignition Engines at or Above 30 Liters per Cylinder – Established two additional tiers of NOx standards for Category 3 marine diesel engines, taking effect in 2011 and 2016; established HC and CO standards; and established limit on sulfur in marine fuel in the Emission Control Area (2012 for 1.0% and 2015 for 0.1%)	2016 2011 2015 2012
		Greenhouse Gas Reporting Program – Required reporting of greenhouse gas emissions from all sectors of the economy	2011
		Tier 3 and Tier 4 Emission Standards for Marine Diesel Engines – Established more stringent emission standards for newly built and remanufactured Category 1 and 2 marine diesel engines Commercial: Tier 4 2014-2017 Commercial and Recreational: Tier 3 2009-2014	2014 2009
	Locomotives	Greenhouse Gas Reporting Program – Required reporting of greenhouse gas emissions from all sectors of the economy	2011
		Tier 3 and Tier 4 Emission Standards for Locomotive Diesel Engines – Established more stringent emission standards for newly built and remanufactured engines	2011
Nonroad Spark Ignition Engines and Equipment	Small Spark Ignition Engines (Small SI)	Control of Emissions from Nonroad Spark Ignition Engines and Equipment – Established more stringent exhaust emission standards for Class I (model year 2012) and Class II (model year 2011) engines below 19 kilowatts and fuel permeation standards for all engines below 19 kilowatts	2012 2011
	Marine Spark Ignition Engines (Marine SI)	Greenhouse Gas Reporting Program – Required reporting of greenhouse gas emissions from all sectors of the economy	2011
		Control of Emissions from Nonroad Spark Ignition Engines and Equipment – Established first federal exhaust emission standards for sterndrive and inboard Marine SI engines and increased the stringency of exhaust emission standards for outboard and personal watercraft engines. Established new evaporative emission standards for all Marine SI engines	2010
	Large Spark Ignition	Greenhouse Gas Reporting Program – Required reporting of greenhouse gas emissions from all sectors of the economy	2011

	Engines (Large SI)	New Emissions Standards for Large SI Engines – Established new emission standards, diagnostic capability and portable emission testing provisions Tier 2 Tier 1	 2007 2004
Recreational Vehicles		Greenhouse Gas Reporting Program – Required reporting of greenhouse gas emissions from all sectors of the economy	2011
		New permeation standards for fuel components	2008
		New Exhaust Emission Standards for Recreational Vehicles – Snowmobiles, Tier 3 Tier 2 Tier 1 Off-highway motorcycles, ATVs and UTVs	 2012 2010 2006 2006
Aircraft[13]		Greenhouse Gas Reporting Program – Required reporting of greenhouse gas emissions from all sectors of the economy	2011
		NOx Emission Standards for Aircraft Gas Turbine Engines – Established new NOx emission standards for aircraft, engines consistent with international standards (Committee on Aviation Environmental Protection, or CAEP) New Type standards: CAEP/8: 2014 CAEP/6: 2012 In-Production standards: CAEP/6: 2013 Control of Air Pollution from Aircraft and Aircraft Engines; Emission Standards and Test Procedures – Established more stringent NOx exhaust emission standards for aircraft engines	2014 2013 2012 2005

In addition to regulating vehicles and engines, EPA regulates motor vehicle fuels, including gasoline, diesel, and renewable fuels such as ethanol and biodiesel. Refer to Table 1-2 for EPA resources.

EPA also regulates portable fuel containers, as described in Table 1-3. (This industry is not covered by a specific section in this report.) EPA began validation test work on various manufacturers' portable fuel container emission families, and that work is continuing. The industry consistently sells approximately 20 million containers per year and consists of 14 certificates and nine manufacturers.

[13] The Federal Aviation Administration has primary oversight responsibility for aircraft emissions compliance. A general overview can be found on the web at: www.faa.gov/regulations_policies/policy_guidance/envir_policy/media/Primer_Jan2015.pdf.

Compliance programs play an essential role in delivering the benefits that statutes and regulations are designed to achieve. EPA OTAQ oversees a comprehensive set of compliance activities to ensure that vehicle and engine manufacturers and fuel refiners and producers satisfy their regulatory obligations.

1.4 Air Quality Trends and the Contribution of Mobile Sources to Air Pollution

This section presents information about air pollution trends for context and perspective. This information comes from EPA's latest Air Quality Trends Report (2017), and from the National Emissions Inventory for the year 2014.

1.4.1 Air Quality Has Improved

The concentration of a pollutant is the amount of that pollutant found in the air, measured over a specific averaging time at an air quality monitor. As described in the Air Quality Trends Report for 2016, nationally, concentrations of criteria and hazardous air pollutants have dropped significantly since 1990, for example:

- Carbon monoxide (CO) 8-hour average, concentrations down 77%;
- Lead 3-month average, down 99%;
- Nitrogen dioxide (NO_2) annual average, down 56%;
- Nitrogen dioxide (NO_2) 1-hour average, down 50%;
- Ozone 8-hour average, down 22%;
- Particulate matter $\leq$ 10 microns (PM_{10}) 24-hour average, down 39%;
- Particulate matter $\leq$ 2.5 microns ($PM_{2.5}$) annual average, down 42%;
- $PM_{2.5}$ 24-hour average, down 44%;
- Sulfur dioxide (SO_2) 1-hour average, down 85%; and
- Air toxics, down by percentages varying by specific pollutant. [14]

Decreases in pollutant concentrations measured at air quality monitors indicate that EPA's air pollution control programs are collectively achieving the goal of improving air quality.

Decreases in annual emissions estimates are also an indicator of the overall effectiveness of EPA's air pollution control programs. Annual emissions estimates describe the total amount of a pollutant that is emitted or released over the course of a year from all sources, such as power plants, industrial facilities, onroad vehicles, off-road vehicles, and local area sources. Between 1980 and 2016, the U.S. economy continued to grow, the number of vehicle miles travelled in the U.S. continued to grow, and population and energy use also increased, as seen in Figure 1-1.[15] During the same time period, total emissions of

[14] EPA's National Air Quality Trends Report for 2016, found on EPA's web page at: www.epa.gov/air-trends. "Criteria" air pollutants are those for which EPA sets national ambient air quality standards.

[15] EPA's National Air Quality Trends Report for 2016, found on EPA's web page at: www.epa.gov/air-trends.

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six principal air pollutants dropped by 67 percent.[16] However, the graph also shows that between 1980 and 2015, CO_2 emissions – for which there are no ambient air quality standards - increased 15 percent.

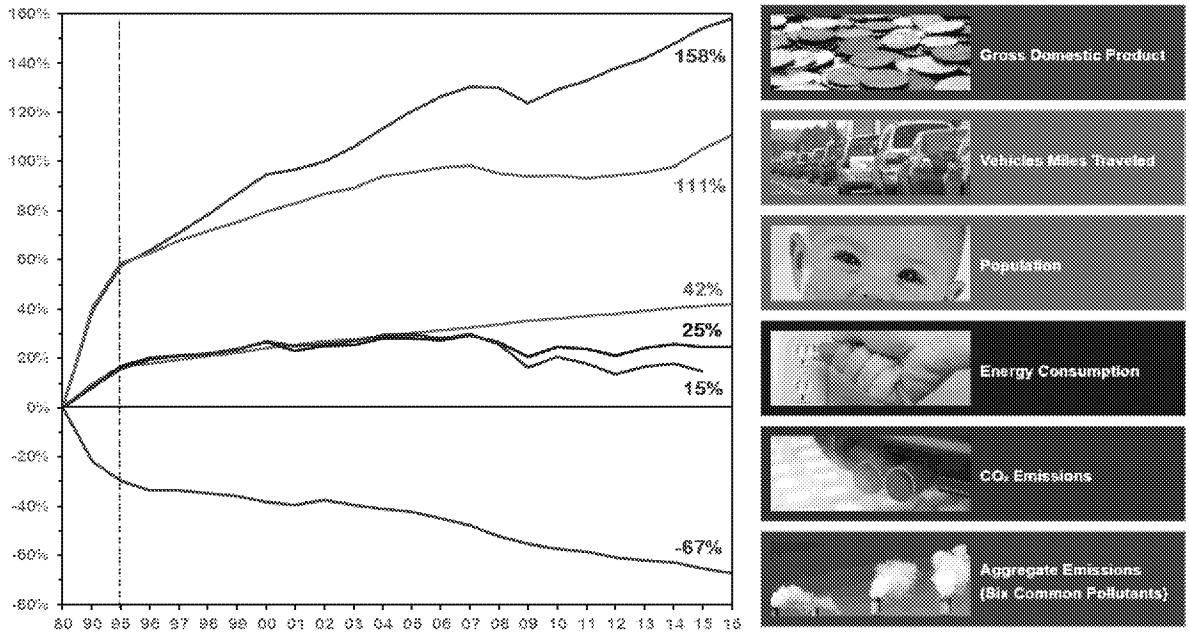

Figure 1-1: Comparison of Growth Areas and Emissions, 1980-2016[17]

While emissions of pollutants declined over this period, there are still areas of the country where air quality is worse than the National Ambient Air Quality Standards.[18]

1.4.2 National Emissions Inventory

EPA's estimates of national emissions also provide context for EPA's air pollution control programs. The National Emissions Inventory (NEI) is a comprehensive national inventory of emissions of both criteria and hazardous air toxic pollutants from 60 different emissions sectors, developed on a three-year cycle.[19]

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[16] The six pollutants included are CO, nitrogen oxides (NO_x), PM_{10} and $PM_{2.5}$, volatile organic compounds (VOC), SO_2, and ammonia (NH_3).

[17] EPA's National Air Quality Trends Report for 2016, found on EPA's web page at: www.epa.gov/air-trends.

[18] EPA sets National Ambient Air Quality Standards for the pollutants ozone, carbon monoxide (CO), particulate matter of diameter less than or equal to 10 microns (PM_{10}), particulate matter of diameter less than or equal to 2.5 microns ($PM_{2.5}$), nitrogen dioxide (NO_2), lead, and SO_2. Ozone is not directly emitted, but forms in the atmosphere from volatile organic compounds (VOCs) and nitrogen oxides (NOx). For more information, see EPA's web page at www.epa.gov/criteria-air-pollutants.

[19] This information is based primarily upon data provided by state, local, and tribal air agencies for sources in their jurisdictions, and supplemented by data developed by EPA. The latest NEI available is for the year 2014. Information about the National Emissions Inventory can be found on EPA's web page at: www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei.

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The NEI data for 2014, the most recent year available, show that mobile sources account for about 7% of the emissions of both $PM_{2.5}$ and VOCs, and more than half of the NOx and CO emissions nationwide. See 0 for additional information from the NEI.

Figure 1-2 shows the contribution of the various types of mobile sources to the mobile source part of the emissions inventory for these four pollutants. The pie chart is divided into the following categories:

- Onroad includes all vehicles built to operate on roadways, such as passenger cars and trucks, heavy-duty trucks, and motorcycles, and
- Nonroad includes vehicles and equipment used for construction and mining, agriculture, recreation, industry, lawn and garden, and logging.
- Marine, locomotive, and aircraft are the other mobile sources represented.

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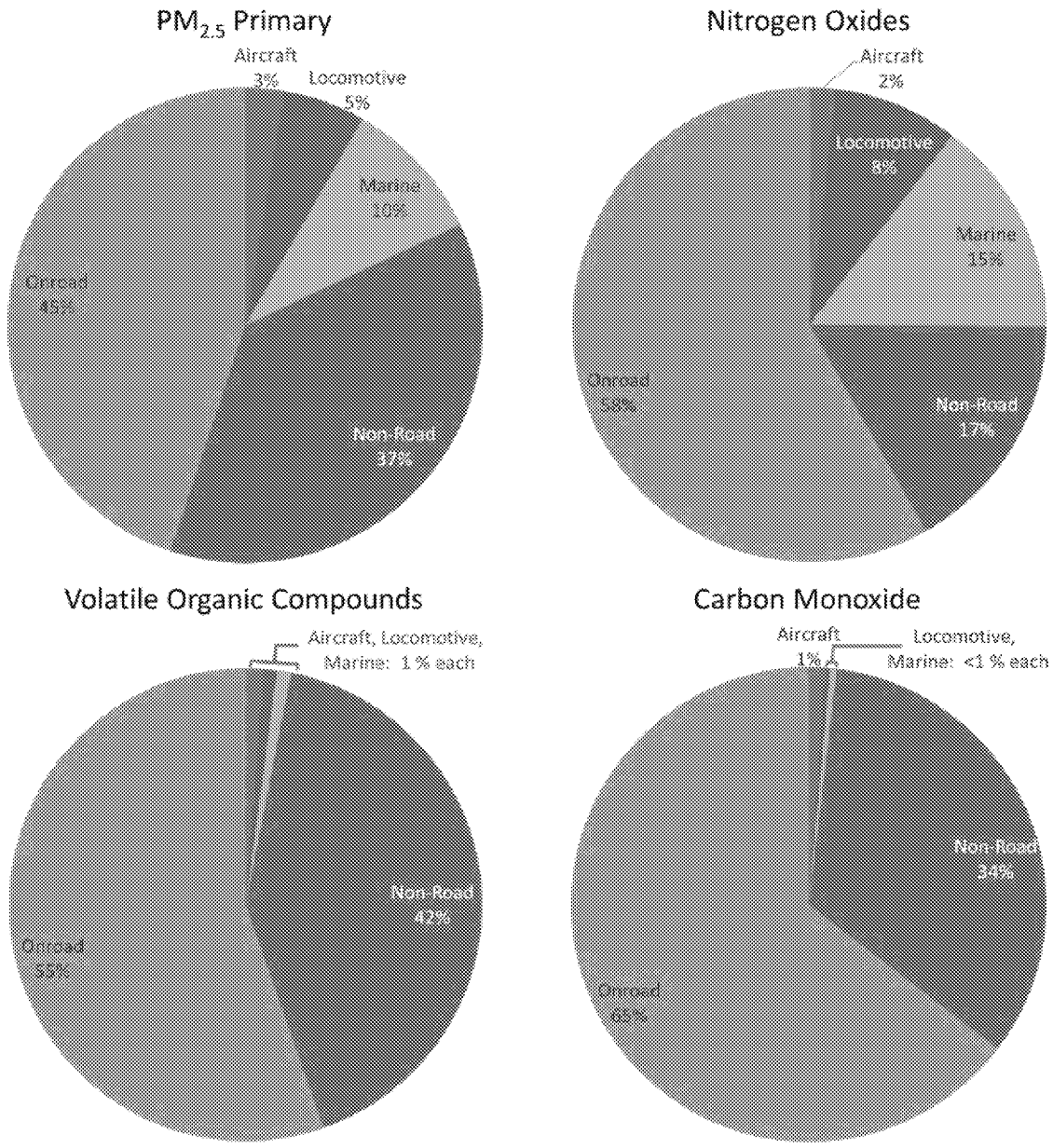

Figure 1-2: U.S. Mobile Source Emissions by Sector, 2014

Mobile sources, which include onroad vehicles and offroad vehicles and equipment, are the dominant emissions sources in many individual urban areas.

In all four cases, the "Onroad" sector makes up the single largest percentage of the mobile source emission pie, followed by the "Nonroad" sector. "Marine," "Locomotive," and "Aircraft" make up the remainder. Mobile sources are significant contributors to total national emissions and are the dominant emissions sources in many individual urban areas. In addition, mobile sources contribute to

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higher localized levels of pollutants near roads and transportation facilities. More than 45 million people in the United States live, work, or attend school within 300 feet of a major road, airport, or railroad. Individually and in combination, many of the pollutants found near roadways have been associated with adverse health effects. [20] Onroad and nonroad vehicles and engines are used by people as they go about their daily lives – at work, at home, in transit, and in recreation.

These facts emphasize the importance of EPA's transportation-related air quality programs. All mobile source sectors contribute to the national inventory of emissions. EPA OTAQ's compliance programs cover all of these sectors, as described in the next sections of this report.

[20] More information is available at: www.epa.gov/air-research/near-roadway-air-pollution-and-health-frequent-questions

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2. Overview of Compliance Programs and Processes

2.1 Background

EPA emissions regulations have a variety of testing and reporting obligations that enable EPA OTAQ to monitor compliance. The programs may apply to vehicles and engines before they are produced (preproduction), during production, and after they are in customer service (postproduction). EPA has the authority and flexibility to choose compliance strategies that best fit an industry sector at any given time. Factors that influence the use of a particular compliance approach include the regulatory requirements affecting a given industry sector, the technology being used to meet the emission standards, industry-specific production processes and cycles, and sector or manufacturer size.

However, another factor influencing EPA OTAQ's compliance approach emerged in the time period covered by this report. In 2015, Volkswagen admitted to equipping U.S. diesel passenger cars dating back to the 2009 model year with software designed to circumvent the emissions control system, sacrificing pollution control for other features important to the company. The deceit involved software that detected when vehicles were undergoing emissions testing and directed full activation of emission controls only during the test. During normal vehicle operation, the software switched off emission controls, allowing the cars to emit nitrogen oxides at levels up to 40 times the standard.[21] This type of software is known as a "defeat device" because it defeats the purpose of the vehicles' emissions control systems.

In January 2016, the Department of Justice filed a complaint on behalf of EPA in federal court, alleging that Volkswagen violated the Clean Air Act. Since that time, the company has settled the lawsuit, agreeing to pay billions of dollars to repair or buy back affected vehicles, mitigate excess air pollution, and invest in electric vehicle infrastructure. Volkswagen also pleaded guilty to criminal action on the part of individuals, and has paid criminal penalties.

EPA is continually adapting and changing compliance programs to become less predictable.

EPA OTAQ is continuously evaluating how to assess and improve manufacturer compliance throughout the life of the vehicles and engines produced. As a result of the 2015 experience with Volkswagen, we recognized the need to again adapt and change our compliance programs to become less predictable. In September of 2015, we announced to manufacturers that our testing would include additional evaluations designed to detect potential defeat devices.

Given that vehicle and engine manufacturing occurs worldwide, EPA sends teams to manufacturing locations abroad, to test vehicles and engines coming off the assembly line. EPA also partners with other federal agencies, such as U.S. Customs and Border Protection, to leverage their activities to inspect vehicles and engines at the point these products enter the U.S.

EPA's mobile source compliance processes seek to ensure that the vehicles and engines are fully compliant with emissions standard throughout their full useful life, so EPA's testing programs and other

[21] More information can be found on EPA's website, at www.epa.gov/vw.

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requirements are designed to cover the lifespan of vehicles and engines. Generally, EPA's mobile source compliance programs and activities can be divided into three periods:

- **Preproduction** activities include certification testing and reporting and other compliance processes conducted before vehicles and engines are produced.

- **Production** activities include audits and other compliance testing conducted on vehicles and engines coming off the production line, but before they enter customer service.

- **Postproduction** activities include in-use testing and reporting and other compliance processes conducted after vehicles and engines enter customer service.

Although compliance activities for the various mobile source sectors may differ in timing, they generally follow similar protocols. Figure 2-1 illustrates the compliance timeline for light-duty vehicles. As shown in the figure, there are compliance actions that occur preproduction, during production, and in-use at specific mileage points that represent the light-duty vehicle period of useful life.

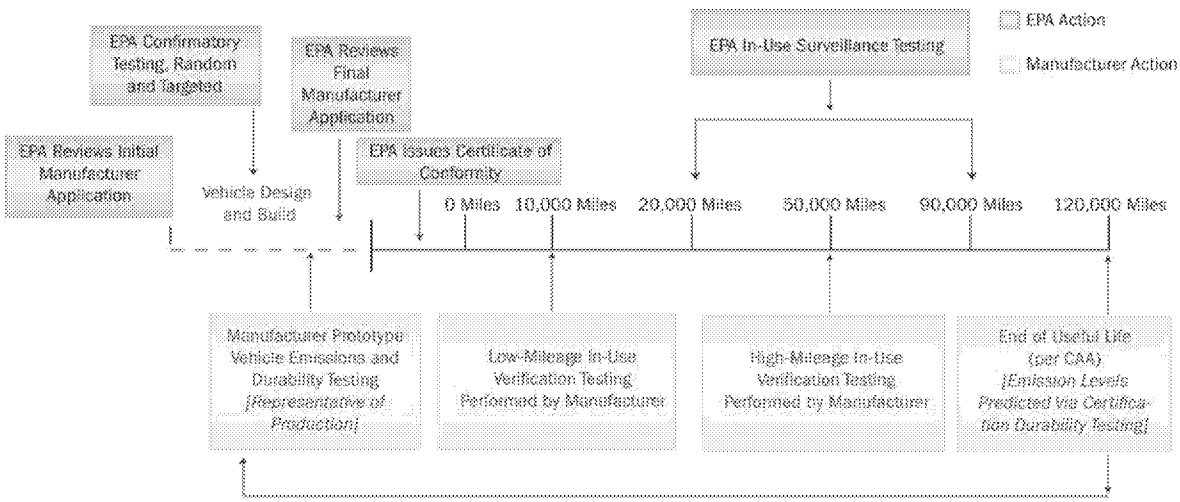

Figure 2-1: Compliance Schedule for Light-Duty Vehicles

Figure 2-2 shows a similar timeline for heavy-duty highway vehicles and nonroad engines. Note these vehicles and engines are considered to have a useful life up to 435,000 miles or 10,000 hours of service – the measure of hours being more appropriate for certain types of sector categories, such as construction equipment.

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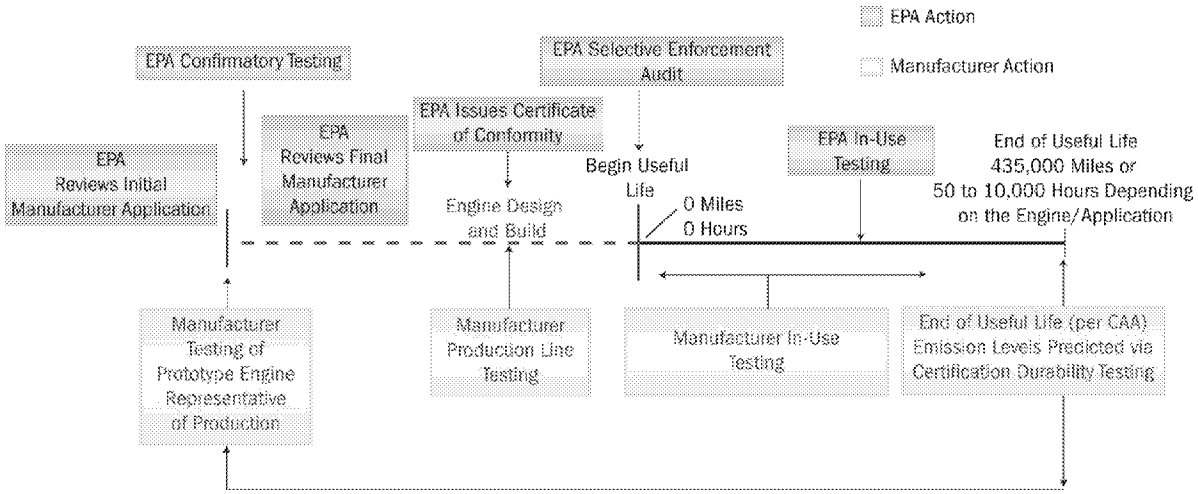

Figure 2-2: Compliance Schedule for Certain Heavy-Duty Highway and Nonroad Engines

2.1.1 Compliance Flexibility

EPA regulations typically give manufacturers some flexibility about how they will achieve emissions compliance. Examples include emissions standard phase-ins, averaging, banking and trading (ABT) programs and several types of exemptions. This regulatory flexibility enables manufacturers to align their business model with emissions requirements and sometimes allow manufacturers to earn credit for introducing new technologies early. At the same time, some regulatory flexibilities introduce challenges to compliance oversight because vehicles and engines subject to one regulation and set of standards may legally certify to different emissions levels. This report includes discussion of flexibility provisions and presents data showing how manufacturers are using them.

2.2 Preproduction Programs: Certificates of Conformity

Section 206 of the Clean Air Act requires all engines and vehicles to be covered by a Certificate of Conformity before they can enter commerce in the U.S. A Certificate of Conformity is a license to produce products for one model year consistent with the vehicle description and any terms of the certificate. Every class of engines and vehicles introduced must have a Certificate of Conformity, and these certificates are generally issued to a group of vehicles or engines having similar design and emission characteristics. For light-duty vehicles, certificates are issued for each unique combination of exhaust test group and evaporative family.[22] For heavy-duty vehicles and nonroad equipment subject to engine standards, the unit of certification is called an engine family. Test groups and engine families may include multiple models. Conversely, different versions within a given model may be included in different engine families or test groups.

[22] An exhaust test group is a group of vehicle models with similar engines, drive trains, and emission control systems. It represents a group of vehicles or engines that have similar design and emission characteristics.

2.2.1 Application for Certification

The certification process begins when a manufacturer submits an application for certification to EPA. Applications cover an exhaust test group or engine family that represents a group of vehicles or engines having similar design and emission characteristics. EPA requires manufacturers to provide detailed information in the certification application to show that the vehicles or engines meet all of the applicable emissions requirements, and to describe the vehicles or engines to be covered by the Certificate of Conformity. The certificate is a license to produce and sell the vehicle and covers only those vehicles or engines specifically described in the application. The list below generally describes the information and data that manufacturers must submit to begin the application process:

- A description of each test group/engine family, including the basic engine design and list of distinguishable configurations to be included in the test group/engine family;
- The production volumes for the U.S. of each configuration in the test group or engine family;
- A description of the test engine representing the test group or engine family;
- An explanation of how the emission control system operates;
- A description of the test procedures and equipment used to test the engine;
- The intended useful life of the family and emission deterioration characteristics over this useful life;
- Durability grouping (i.e., groups of vehicles/engines with similar emission deterioration and emission component durability);
- Durability test procedures;
- A description of vehicles used to demonstrate tailpipe emissions and emission control component durability;
- List of all test results, official certification levels, and the applicable emission standards for each vehicle/engine tested;
- Evaporative and On-Board Recovery Vapor Refueling (ORVR) system information (light-duty only);
- Information on emission control diagnostic systems (i.e., On-Board Diagnostics for applicable sectors);
- Manufacturer representative and official company contact information.

At the end of the application process, manufacturers must attest to a statement that the information being submitted in the application is accurate and complete.

2.2.2 Certificates Issued for Model Years 2014 – 2017

Table 2-1 shows the number of certificates that EPA issued in model years 2014 – 2017.[23]

[23] Certificates for portable fuel containers are not shown in this table. These certificates are unique in that they are valid for five years, rather than one. There were 12 valid certificates held by manufacturers in 2014; 19 in 2015; 21 in 2016, and 23 in 2017.

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Table 2-1: Number of Certificates of Conformity, Model Years 2014 - 2017

Industry Sector	Category	MY 2014	MY 2015	MY 2016	MY 2017
Light-Duty Vehicles	Passenger cars and trucks	536	559	574	599
	Alternative fuel conversions[24]	147	131	204	195
Highway Motorcycles	On-highway motorcycles	289	289	293	299
Heavy-Duty Highway Engines	Compression ignition (diesel)	30	32	34	41
	Spark ignition (mostly gasoline)	10	14	12	15
	Tractors and vocational vehicles	66	97	103	126
	Alternative fuel conversions	31	31	25	22
	Evaporative emissions systems	10	13	12	18
Nonroad Compression Ignition Engines	Diesel powered equipment, such as tractors, generators, construction equipment, forklifts, welders	432	456	489	491
	Diesel boats and ships	148	177	172	193
	Oceangoing vessels per International Maritime Organization requirements	23	33	36	30
	Locomotives	108	121	146	151
Nonroad Spark Ignition Engines	Small SI: Small nonroad gasoline powered equipment, such as lawnmowers, string trimmers, chain saws, small compressors, pumps, utility vehicles < 25 mph, snow blowers, rammers, floor cleaners	900	956	944	972
	Marine SI: Gasoline boats and personal watercraft	169	189	172	178
	Large SI: Large nonroad gasoline powered equipment, such as forklifts, compressors, generators, and stationary equipment	194	208	210	226
	Evaporative components (mostly intended for small nonroad gasoline and marine gasoline equipment)	815	831	843	866
Recreational Vehicles	All-terrain vehicles / utility vehicles	197	205	206	232
	Off-highway motorcycles	49	53	47	49
	Snowmobiles	32	29	29	33
Total		**4186**	**4424**	**4551**	**4736**

[24] Conversion systems modify vehicles and engines so that they can run on different fuels than the ones for which they were originally designed. For more information, see Section 9, Alternative Fuels and Alternative Fuel Conversions. Also see EPA's webpage at: www.epa.gov/vehicle-and-engine-certification/vehicle-and-engine-alternative-fuel-conversions.

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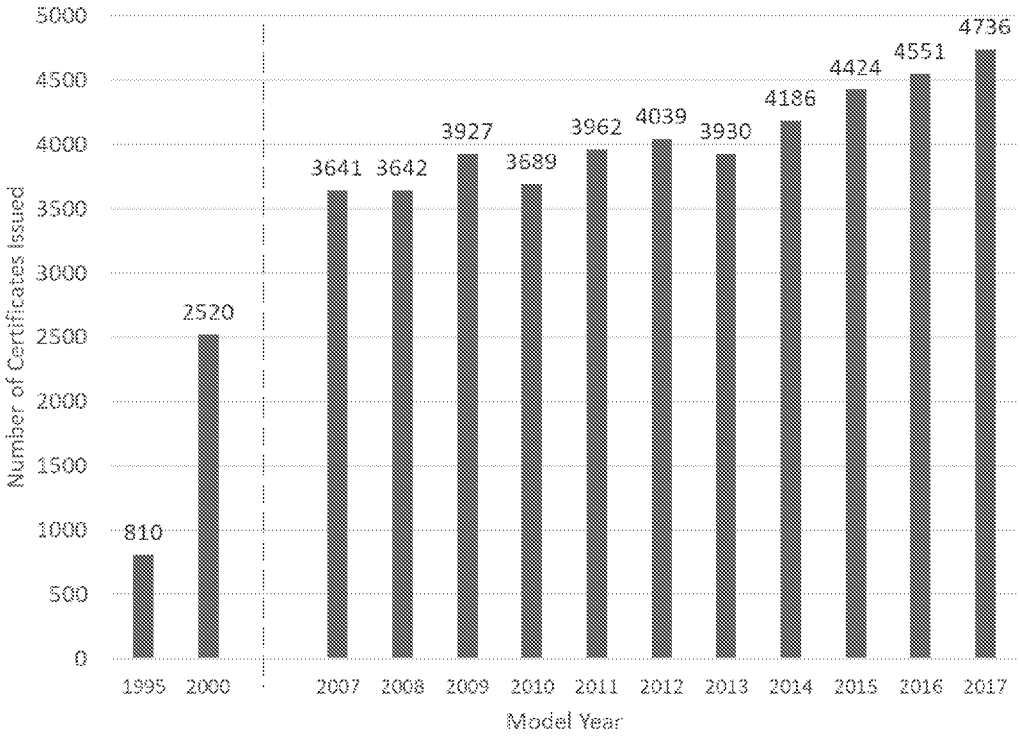
2.2.3 Increase in Certificates Issued

By requiring certificates for all vehicles and engines, EPA ensures that manufacturers in a sector meet the same requirements.

While it is typical for the number of certificates to fluctuate from year to year, the overall trend has been one of growth, as shown by the increasing number of certificates issued each model year from 2014 through 2017 in Table 2-1. This is a longer-term trend: for model year 1995, EPA issued 810 certificates of conformity; for model year 2000, EPA issued 2,520 certificates; for model year 2007, it was 3,641.[25] The total number of certificates EPA issued in model years 1995, 2000, and 2007 - 2017 is shown in Figure 2-3.[26] The dashed vertical line in the figure denotes a change in the x-axis scale (beginning with model year 2007, information is yearly).



[25] The number of certificates for model years 2000 and 2007 come from the "2008 Progress Report, Vehicle and Engine Compliance Activities," EPA-420-R-10-022, which updated the total number of certificates for model year 2007. All of EPA's previous compliance reports can be found on EPA's web page at: www.epa.gov/vehicle-and-engine-certification/compliance-activity-reports-vehicles-and-engines. The number of certificates in model year 1995 has not been included in a previous compliance report.

[26] This figure does not include certificates for portable fuel containers.

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Figure 2-3: Total Number of Certificates Issued in Model Years Since 1995

The later sections of this report cover production volume for the U.S. of the various vehicle and engine types over model years 2014 – 2017. Regardless of how production volumes for the U.S. have changed, the variety of vehicles, engines, and components that EPA certifies continues to increase.

From model years 2007 to 2017, the number of certificates EPA has issued has increased from 3,639 to 4,736, an increase of 30%. Table 2-2 shows the number of model year 2007 certificates compared to the number of model year 2017 certificates by category, along with the difference and percent change from model year 2007. This table uses the category names from the 2007 and 2008 compliance activity reports; new categories since that time are in italics. These years are just a snapshot; not shown is the fluctuation in numbers of certificates for each category during the years in between.

Table 2-2: Comparison of Certificates Issued for Model Years 2007 and 2017

Industry Sector	Category Name	MY 2007	MY 2017	Change	Percent Change
Light-Duty Vehicles	Cars & Light Trucks	518	590	72	14%
	Light-Duty Vehicle Independent Commercial Importers	22	9	-13	-59%
	Light-Duty Alternative Fuel Conversions	--	195	195	
Highway Motorcycles	Motorcycles	418	299	-119	-28%
Heavy-Duty Highway Engines	Semi trucks and buses (diesel)	58	42	-16	-28%
	Semi trucks and buses (gasoline)	38	36	-2	-5%
	Heavy-Duty Alternative Fuel Conversions	--	0		
	Heavy-Duty Tractors and Vocational Vehicles	--	126		
	Heavy-Duty Engine Evaporatives	19	18	-1	-5%
	Agricultural and Construction Equipment	676	491	-185	-27%
Nonroad Compression Ignition Engines	Diesel Boats and Ships	117	193	76	65%
	Oceangoing vessels	31	30	-1	-3%
	Locomotives	60	151	91	152%
Nonroad Spark Ignition Engines	Lawn and Garden Equipment	1084	972	-112	-10%
	Gasoline Boats and Personal Watercraft	112	178	66	59%
	Forklifts, Generators, and Compressors	34	226	192	565%
	Nonroad Spark Ignition Evaporative Components	--	866	866	
Recreational Vehicles	All-Terrain Vehicles	309	232	-77	-25%

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	Nonroad Motorcycles	106	49	-57	-54%
	Snowmobiles	37	33	-4	-11%
Total		**3639**	**4736**	**1097**	**30%**

As seen in the table, some sectors have remained relatively stable, such as oceangoing vessels, heavy-duty gasoline trucks and buses, and snowmobiles; some sectors show general increases over time such as light-duty vehicles; and in some sectors, there have been substantial changes. For example, the category of "forklifts, generators, and compressors" has increased by more than five times. Also, since model year 2007, some new categories of certificates have been added to EPA's list:

- alternative fuel conversions, for both light-duty and heavy-duty vehicles (a new category as a result of a 2011 rulemaking providing manufacturers with additional compliance options);
- evaporative components for nonroad spark ignition engines (a 2008 regulation established evaporative emissions standards); and
- heavy-duty tractors and vocational vehicles (a new category created in 2011 heavy-duty greenhouse gas rule; these were previously not regulated as complete vehicles).

2.2.4 EPA's Improved Data Collection System

EPA's "Engines and Vehicles – Compliance Information System," or EV-CIS, is a comprehensive system used to collect and verify data from manufacturers, which facilitates the issuance of certificates of conformity. As of 2015, the disparate systems of data collection that had evolved for the various vehicle and engine sectors were consolidated into this one umbrella system. EV-CIS allows vehicle and engine manufacturers to submit required data efficiently and securely, while also allowing EPA to share nonconfidential data with government partners such as the National Highway Traffic Safety Administration, as well as with other stakeholders.

EPA's EV-CIS data system includes built-in validation of manufacturer data, preventing errors. EV-CIS is an example of EPA's use of LEAN principles to achieve our mission more effectively.

EV-CIS covers a broad range of mobile source industries. It includes modules for 14 industries, each with its own unique regulatory requirements, as well as modules for implementing light-duty and heavy-duty greenhouse gas programs. The system captures more than 11,000 data elements submitted by manufacturers. The modular approach enables changes when EPA OTAQ needs to integrate new or revised rules into the system.

EV-CIS is not just an internal EPA improvement. The system includes built-in validation of certain manufacturer data, thus preventing errors in data entry and improving the process for everyone. EV-CIS is an example of EPA's use of LEAN principles to create efficient and effective systems, and EPA remains committed to continuous improvement.

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2.2.5 Confirmatory Certification Testing

Manufacturers conduct the initial testing to support an application for a Certificate of Conformity and report the results to EPA. Subsequent certification testing, called confirmatory testing, occurs after an application has been submitted. Confirmatory tests are performed by either the manufacturer or by EPA and serve to validate the manufacturer's initial emissions or fuel economy test results.

2.3 Production Programs

The objective of compliance activities that occur during production is to confirm that vehicles and engines coming off production lines match specifications set forth in the Certificate of Conformity. In other words, production programs are designed to verify that manufacturers are producing the same vehicle or engine that they certified. Some mobile source regulations call for routine production line testing. EPA may also audit production vehicles and engines without prior notice, using selective enforcement audits. While EPA uses a variety of compliance tools as appropriate for specific industry sectors, the goal is the same across sectors: to ensure that vehicles and engines sold in the U.S. meet the emission standards.

2.3.1 Compliance Audits

An essential part of EPA OTAQ's compliance programs is the ability to inspect products and emission measurement processes in the field to validate that the regulated sectors comply with applicable emission standards. Assessing compliance in a comprehensive manner includes:

- Ensuring that products perform according to applicable emission standards;
- Ensuring that assembly processes result in products faithful to the product for which a Certificate of Conformity was granted;
- Ensuring that emission measurements conducted to submit to EPA conform to applicable standards and procedures;
- Ensuring that records and reports submitted to EPA are accurate, timely, and conform to regulatory requirements.

EPA OTAQ has a variety of field inspection tools that serve to validate the different facets of compliance described above, and because manufacturing occurs across the globe, EPA's compliance audits do as well. Compliance audits in the field are more useful for certain industry sectors than for others. They are used less frequently in the light-duty vehicle industry, because other approaches are available to ensure that vehicles produced are meeting regulations. For example, both EPA and manufacturers implement confirmatory testing for light-duty vehicles, which involves testing pre-production vehicles and engines are tested prior to their introduction into commerce. Furthermore, both EPA and light-duty vehicle manufacturers conduct in-use compliance testing to monitor in-use vehicle emissions. However, in other sectors such as heavy-duty highway engines, nonroad spark ignition engines, recreational vehicles, and highway motorcycles, compliance audits conducted in the field play a greater role and are an important way for EPA to assess compliance.

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Field inspection tools include the following:

- Records Inspection - An inspection to determine whether the records and reports comply with requirements of the Clean Air Act and regulations promulgated thereunder;
- Emission Laboratory Audit - An inspection to determine whether the equipment, calibration processes, and test procedures conform to applicable regulations, to ensure that the results reported to EPA are accurate and valid;
- Test Monitoring - An inspection where EPA personnel observe testing conducted under existing EPA programs such as Production Line Testing or In-Use Test Orders;
- Assembly Line Audit - An inspection to assess whether the assembly procedures will reliably result in a product that is materially the same as that for which a Certificate of Conformity was granted, that the product is properly labeled, and that the ultimate purchaser is provided with emission warranty terms and information on how to properly maintain and use the product;
- Selective Enforcement Audit (SEA) Test Orders - The most formal type of field audit where products are randomly selected, secured, and tested, according to a regulatory methodology and under EPA supervision. Manufacturers are required to test the products according to a test order to demonstrate that the product represented at the time of certification in fact conforms with applicable standards at the time of production. SEAs usually include other field inspection processes, such as records inspections and test lab audits.

The results of a compliance audit generally include feedback to a manufacturer on how to fully comply with regulatory requirements, including those that pertain to laboratory equipment standards, test procedures, records management, and reporting compliance.

EPA's world-wide compliance audits promote a level playing field among manufacturers.

From calendar year 2014 to 2017, EPA OTAQ's Compliance Division conducted 91 compliance audits across a variety of regulated sectors. The number of compliance audits done in each year is shown in Table 2-3.

Table 2-3: Number of EPA OTAQ Compliance Audits, 2014 - 2017

Type of Compliance Audit	2014	2015	2016	2017
Field Audits/Inspections	29	20	11	15
Selective Enforcement Audits (SEAs)	2	2	4	8
Total	31	22	15	23

EPA conducted compliance audits manufacturers on several continents, including North America, Europe, and Asia, as shown on the maps below. In its compliance audits, EPA found issues such as problematic emissions measurement software, noncompliant calibration and testing practices, missing records, use of test fuel that did not meet specifications, and others. Left uncorrected, these issues

could result in EPA not accepting manufacturer's certification data. Thus manufacturers must correct these issues in order to obtain certificates for their products.

Of these 91 compliance audits, 16 were Selective Enforcement Audits (SEAs). For SEAs, a formal pass/fail determination is made at the end of the audit, based on the emission test results of the sampled products. In the period from 2014-2017, EPA suspended one SEA that began in 2013 and the manufacturer agreed to recall its products voluntarily. There were no failed audits among the 16 SEAs conducted from 2014-2017; however, there were testing and laboratory issues that manufacturers were required to correct.

The Agency exercises discretion when selecting families for compliance audits in the field, based on factors such whether test results or other information suggest that emissions from a given family or industry sector are likely to exceed a standard or Family Emission Limit; production volume for the U.S.; its contribution to the inventory; and other compliance program data, such as the results of in-use testing. In addition to these factors, EPA incorporates a random selection component.

Locations of compliance audits are marked with a pin on the maps in Figures 2-4 through 2-6 below. A yellow or red shadow under a pin indicates multiple audits in that area. The darker the shadow, the greater the number of audits in that location. For example, in Southern California, 14 audits occurred in the 2014 – 2017 timeframe.

EPA's compliance presence promotes a level playing field across manufacturers and industries, and maximizes likelihood that the full measure of benefits that regulatory programs are expected to generate are in fact delivered to the public. EPA will continue to use compliance audits, including SEAs, to assess compliance across the world, wherever manufacturing occurs.

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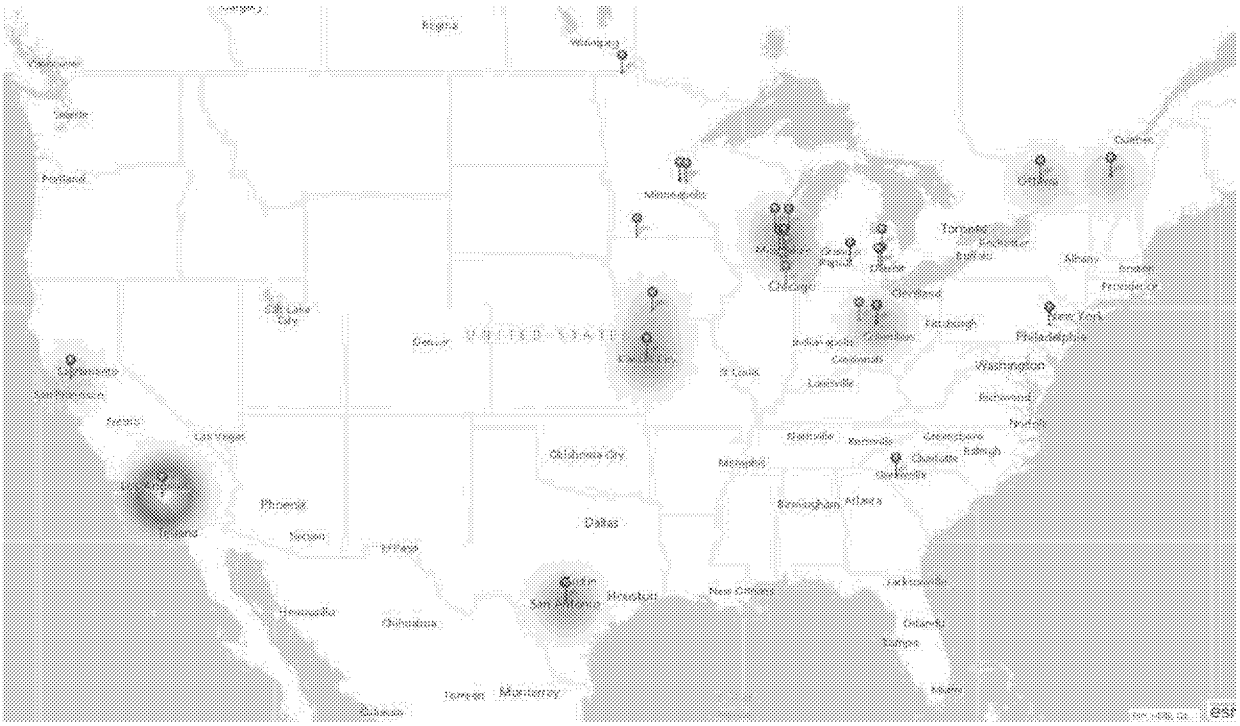

Figure 2-4: EPA OTAQ Field Audit Locations in North America, 2014 – 2017

Figure 2-5: EPA OTAQ Field Audit Locations in Europe, 2014 – 2017

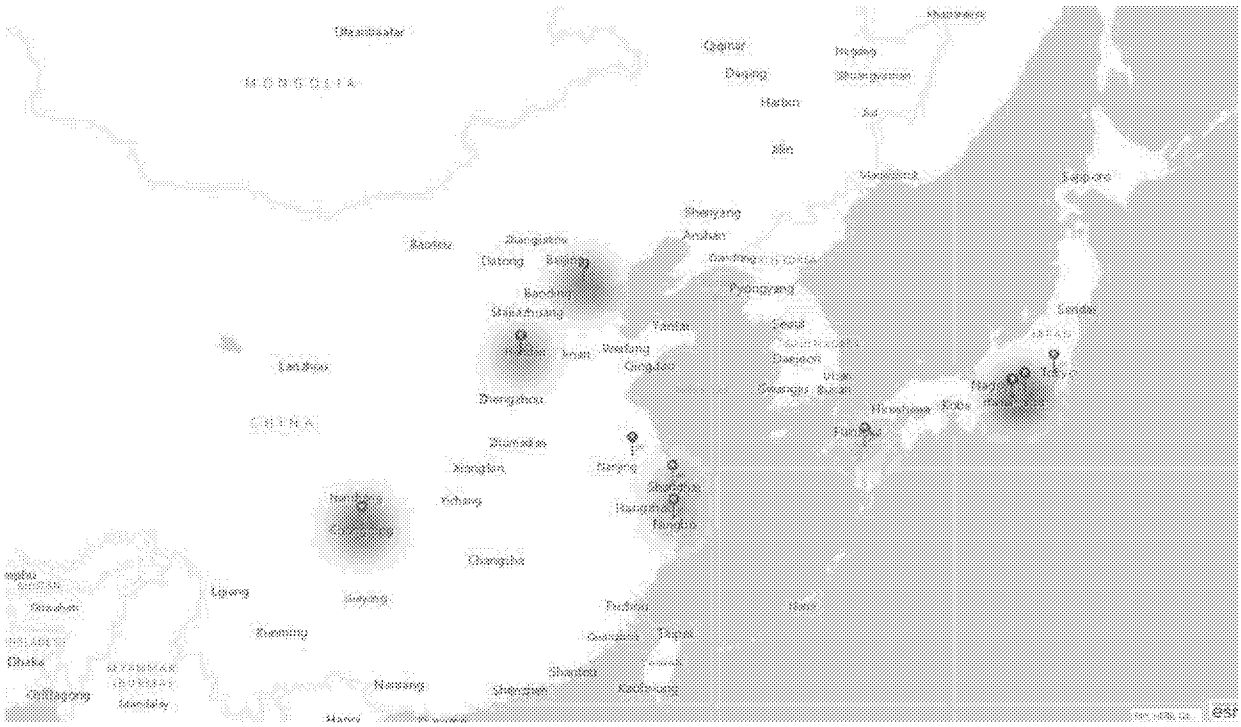

Figure 2-6: EPA OTAQ Field Audit Locations in Asia, 2014 - 2017

2.4 Postproduction Programs

2.4.1 In-Use Compliance Programs

In-use compliance programs track emissions performance of production vehicles and engines after they enter customer service. In-use testing programs are conducted by both EPA and manufacturers. (See Section 3.6, In-Use Compliance Testing.)

2.4.2 Defect Reporting Programs

Manufacturers are required to report emission-related defects to EPA. An emission-related defect is a defect in design, materials or workmanship in a device, system or assembly, as described in the approved application for certification. Manufacturers must report a defect even if it does not increase emission levels. EPA regulations generally establish minimum numbers of confirmed defects that trigger defect information reporting requirements. An emission-related defect can lead to a recall, but this does not happen in every case because some defects in emission-related parts do not increase emissions.

The next sections of this document cover defect reporting for the years 2014-2017. This information is summarized in Table 2-4 below.

Table 2-4: Defect Reports by Regulated Sector, 2014 -2017

Regulated Sector	2014	2015	2016	2017
Light-Duty Vehicles	199	273	228	284
Highway Motorcycles	0	3	4	5
Heavy-Duty Highway Engines	22	29	27	31
Nonroad Spark Ignition Engines	9	2	4	4
Recreational Vehicles	1	2	4	9

2.4.3 Recall Programs

An emissions recall entails action by a manufacturer to repair, adjust, or modify customer-owned vehicles to remedy an emission-related problem. The purpose of an emissions recall is to prevent excessive pollution from vehicles or engines that are already in customer service.

Vehicle and engine manufacturers are required to design and build their products to meet emission standards for the useful life of the vehicle or engine specified by law. Under Section 207(c)(1) of the Clean Air Act, if EPA determines that a substantial number of vehicles or engines in a category or class do not meet emission standards in actual use, even though they are properly maintained and used, EPA can require the manufacturer to recall and fix the affected vehicles and engines. EPA may use a variety of data sources, including EPA and manufacturer test results, to determine that a recall is necessary. When an emissions recall occurs, the manufacturer must notify vehicle owners and provide instructions about how to have the vehicle repaired. Most recalls are initiated voluntarily by manufacturers once potential noncompliance is discovered; however, EPA also has the authority to order the manufacturer to recall and fix noncompliant vehicles or engines if the manufacturer declines to implement a voluntary recall.

Recall programs protect air quality by holding manufacturers responsible to fix defects in their products at no cost to consumers.

The next sections of this document cover recalls by sector for the years 2014-2017. This information is summarized in Table 2-4.

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Table 2-5: Recall Reports and Affected Vehicles/Engines by Regulated Sector, 2014 - 2017

Regulated Sector	2014		2015		2016		2017	
	Recalls	Affected Vehicles	Recalls	Affected Vehicles	Recalls	Affected Vehicles	Recalls	Affected Vehicles
Light-Duty Vehicles	44	9,006,273	64	4,191,581	65	5,969,283	86	4,937,955
Highway Motorcycles	0	0	2	1,050	3	23,931	2	8,179
Heavy-Duty Highway Engines	12	149,392	6	338,453	9	755,553	6	41,752
Nonroad Spark Ignition Engines	2	21,502	0	0	3	9,362	3	4,171
Recreational Vehicles	2	20,016	1	244	1	800	5	90,551

The number of defects and recalls reported light-duty vehicles is greater than any other industry sector, because this industry differs from the others in terms of requirements, complexity of systems, and infrastructure of the industry. The light-duty sector has been regulated since the 1970s and the emission standards are the most stringent of any sector. As described earlier, light-duty manufacturers must conduct in-use testing, which allows them to identify defects issues in production, and EPA also conducts this type of testing. In addition, light-duty vehicles have the most sophisticated and complex emission control systems, including on-board diagnostic systems, that are integrated with other computer-controlled systems within a vehicle. Given this greater complexity, there is a greater opportunity for defects to occur. Finally, the light-duty vehicle sector has existing infrastructure, in the form of dealerships, that facilitates conveying information about defects and recalls to consumers, as well as implementing recalls and servicing vehicles. In other sectors, warranty tracking systems are not as developed, and many smaller certificate holders lack appropriate infrastructure for robust reporting. Therefore, defect and recall programs play a greater role in the light-duty industry, and as discussed in Section 2.3.1; compliance audits play a more important role in other industry sectors.

2.5 Regulatory Flexibility Programs

EPA builds flexibility into its emissions regulations to increase compliance efficiency, decrease costs, and encourage manufacturers to introduce new technologies.

2.5.1 Average Banking and Trading Programs

Average Banking and Trading (ABT) provisions allow manufacturers to meet an overall fleet average standard instead of an individual vehicle or engine standard. Manufacturers can use the ABT provisions by certifying some vehicles and engines at levels below the emission standard, thus generating positive credits that can be used to offset vehicles and engines with emissions above the standard. Compliance

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is determined by calculating the manufacturer's fleet-wide average of each exhaust test group's production or sales volume and emission level. The reconciliation generally occurs on an annual basis. The flexibility to meet fleet average emission standards by ABT credits can facilitate earlier introduction of clean technology into the market.

2.5.2 Transition Program for Equipment Manufacturers

The Transition Program for Equipment Manufacturers (TPEM) recognizes a potential challenge that can face equipment manufacturers when new emission standards take effect. When engines are redesigned to achieve the required emission reductions, equipment powered by those engines may also need to be redesigned. A relatively small number of engine designs can be used in thousands of different products. TPEM permits equipment manufacturers a transition period during which they may continue to use a limited number of engines meeting the previous standards while they update their product designs to accommodate redesigned engines that meet the new standards.

2.5.3 Small Volume Manufacturers

The regulations also allow for flexibility for "small-volume manufacturers" of vehicles, engines, and equipment in meeting some of the compliance requirements. For example, a small-volume manufacturer may use optional procedures to demonstrate compliance with general standards and specific emission requirements. The definition of small-volume manufacturer varies by sector, and is based on factors such as the number of units sold, the number of employees the manufacturer has, and/or the manufacturer's revenue in either the current or a baseline year. Table 2-6 below provides examples of these thresholds for the various sectors. The descriptions in this table are brief summaries of EPA regulations; please refer to the regulations themselves for the legal definitions.

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Table 2-6: Small-Volume Manufacturer Thresholds

Industry Sector / Regulation	Regulation	Small-Volume Manufacturer Threshold
Light-Duty Vehicles	40 CFR 86.1838-01	5000 units with respect to the compliance with Tier 3 standards, and 15,000 units for all other requirements, or a manufacturer that qualifies as a small business under the Small Business Administration regulations.
Highway Motorcycles	40 CFR 86.410-2006	< 500 employees and producing < 3000 motorcycles per year for the U.S.
Heavy-Duty Highway Engines	40 CFR 1036.801 and 1037.801	HD on-highway engine/vehicle manufacturer: defined by limits on the total number of employees (< 1000 for engine manufacturers, < 1,500 for vehicle manufacturers) and total revenue.
Nonroad Compression Ignition Engines (Nonroad CI)	40 CFR 1039.801	Construction and agricultural equipment: ≤ 2500 units produced for the U.S. and ≤ 1000 employees.
	40 CFR 1042.901	Marine diesel boats and ships, oceangoing vessels: annual worldwide production of < 1,000 internal combustion engines of Category 1 and 2 (marine and nonmarine). Manufacturers of Category 3 engines are not small volume manufacturers.
	40 CFR 1033.901	Locomotives: ≤ 1,000 employees.
Nonroad Spark Ignition Engines (Nonroad SI)	40 CFR 1054.801	Small SI (lawnmowers, string trimmers, chain saws, small compressors, pumps, snow blowers): • Handheld engines/equipment: ≤ 25,000 units produced for the U.S. per year; • Non-handheld engines: ≤ 10,000 units produced for the U.S. per year; • Non-handheld equipment: ≤ 5000 units produced for the U.S. per year.
	40 CFR 1045.801	Marine SI (inboard and outboard motorboats, jet-skis) • Engines: ≤ 250 employees; • Vessels: ≤ 500 employees.
	40 CFR 1048.801	Large SI (forklifts, large compressors, generators): ≤ 2000 units produced for the U.S. per year or with < 200 employees.
Recreational Vehicles	40 CFR 1051.801	All-terrain vehicles (ATVs) and off-highway motorcycles: ≤ 5000 off-road motorcycles and ATVs per year produced for the U.S.
	40 CFR 1051.801	Snowmobiles: U.S. production of ≤ 300.

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2.5.4 Exemption Programs

Some vehicles and engines imported into the United States are eligible for an exemption from federal emission requirements. For example, vehicles belonging to military personnel or nonresidents may be eligible for exemption, and vehicles imported for testing or display may also be exempt. Depending on the type of exemption, importers must request written EPA approval in advance. EPA works with the Department of Homeland Security U.S. Customs and Border Protection to ensure that proper approvals have been issued before vehicles and engines may enter the United States. An exemption may cover multiple vehicles and/or engines.

Table 2-7 below shows the number of import exemptions for the categories of light-duty vehicles, heavy-duty vehicles and nonroad engines and equipment, highway motorcycles, and recreational vehicles in the years 2014 – 2017, by exemption type.

Table 2-7: Number of Import Exemptions by Type, Calendar Years 2014 - 2017

Import Exemption Type	2014	2015	2016	2017
Returning Military Service Personnel	634	599	616	544
Non Resident	579	724	701	688
Repair/Alteration	124	164	160	194
Testing	238	205	309	408
Display	45	57	68	62
Racing	349	343	474	484
Competition	94	138	152	162
Total	**2063**	**2230**	**2480**	**2542**

Figure 2-7 displays this same information in a bar chart.[27]

[27] "Military" in this figure refers to exemptions for returning military service personnel.

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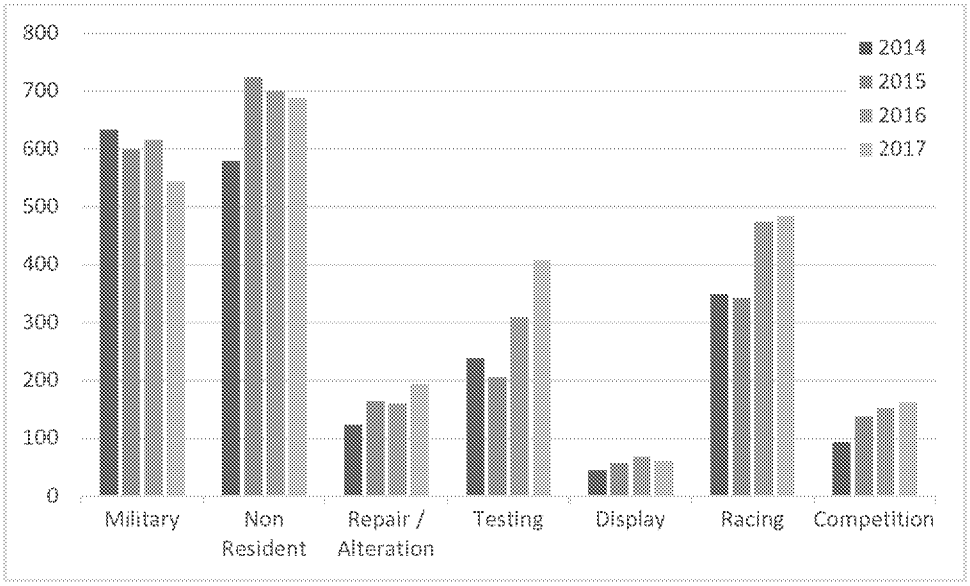

Figure 2-7: Import Exemptions by Type, 2014-2017

In calendar years 2014 through 2017, EPA issued a total of 9,315 import exemptions: 6,328 for light-duty vehicles, 787 for heavy-duty and nonroad engines or equipment, and 2,200 for highway motorcycles and recreational vehicles (ATVs, off-highway motorcycles, and snowmobiles). Figure 2-8 illustrates import exemptions by sector, and shows that more than two thirds of the total import exemptions were for light-duty vehicles in these years. About a quarter were either for motorcycles or recreational vehicles. Heavy-duty and nonroad engines and equipment comprised the remainder.

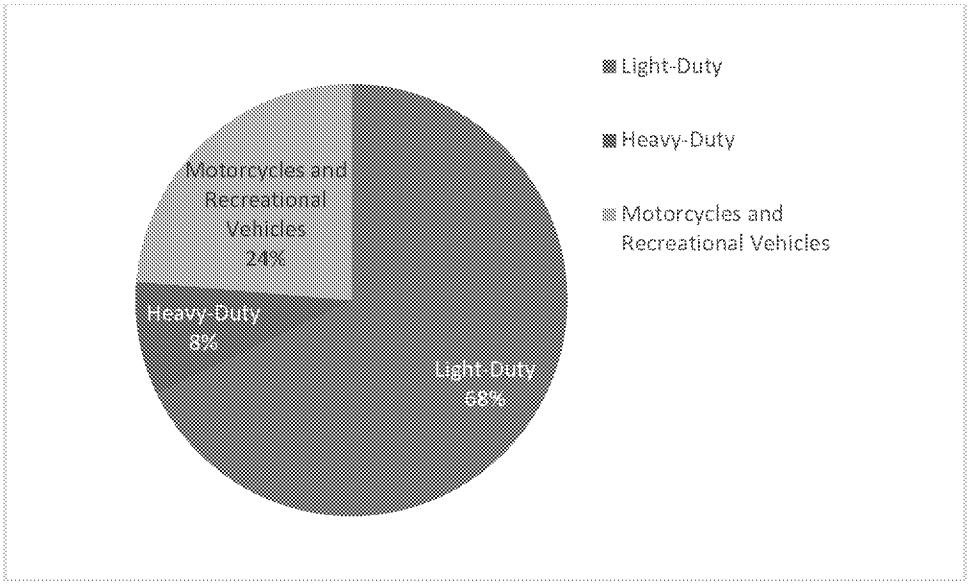

Figure 2-8: Import Exemptions by Sector, Combined for Years 2014 – 2017

2.6 Enhanced Compliance Oversight as a Result of Volkswagen Clean Air Act Violations

As this compliance report covers model years 2014-2017 as well as compliance actions taken in calendar years 2014-2017, it would not be complete without mention of Volkswagen diesel vehicle Clean Air Act violations. Volkswagen, Audi, and Porsche (collectively, "Volkswagen" in this section), equipped their model year 2009 – 2016 diesel passenger vehicles with software that enabled cars to pass emissions tests, but exceed pollution standards during normal vehicle operation.

EPA has since resolved a civil enforcement case against Volkswagen, subject to three partial settlements. These settlements resolve allegations that Volkswagen violated the Clean Air Act by the sale of approximately 590,000 model year 2009 to 2016 diesel motor vehicles equipped with "defeat devices" in the form of computer software designed to cheat on federal emissions tests. The major excess pollutant at issue in this case is oxides of nitrogen (NOx), which causes serious health concerns. Volkswagen has also pleaded guilty to criminal felony counts and has paid $2.8 billion in criminal penalties.[28]

Volkswagen installed software on certain diesel vehicles that is designed to detect when the vehicle is undergoing emissions testing and turns full emissions controls on only during the test. The effectiveness of emissions control devices is reduced during all normal driving. This results in cars that meet emissions standards in the laboratory or testing station, but during normal operation, emit NOx at levels up to 40 times the standard. This software is a "defeat device" that is prohibited under the Clean Air Act.[29] Affected vehicles included both 2.0 liter and 3.0 liter diesel light duty vehicles, as shown in Table 2-8.

[28] For additional information, see EPA's webpage at: www.epa.gov/vw and www.epa.gov/enforcement/volkswagen-clean-air-act-civil-settlement

[29] Section 203(a)(3)(b) of the Clean Air Act, 42 U.S.C. Sec. 7522(a)(3)(b), prohibits the manufacture, selling, or installation of any device that intentionally circumvents EPA emission standards by bypassing, defeating, or rendering inoperative a required element of the vehicle's emissions control system.

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Table 2-8: Volkswagen Light-Duty Diesel Vehicles and Model Years Affected by the Defeat Device

Vehicle Model	Model Years
2.0 Liter Diesel	
Jetta	2009 – 2015
Jetta Sportwagen	2009 – 2014
Beetle	2013 – 2015
Beetle Convertible	2013 – 2015
Audi A3	2010 – 2015
Golf	2010 – 2015
Golf Sportwagen	2015
Passat	2012 – 2015
3.0 Liter Diesel	
Volkswagen Touareg	2009 – 2016
Porsche Cayenne	2013 – 2016
Audi A6 Quattro	2014 – 2016
Audi A6 Quattro	2014 – 2016
Audi A8	2014 – 2016
Audi A8L	2014 – 2016
Audi Q5	2014 – 2016
Audi A7	2009 – 2016

The Volkswagen defeat device case reinforces the need for EPA's active and visible presence in monitoring compliance with emissions standards. As described throughout Section 2 of this report, EPA employs a rigorous, multi-layer process to test and certify new vehicle models before they can be sold, and for testing vehicles that are in production and on the road. As technologies evolve and circumstances change, EPA continuously considers ways to improve compliance and oversight programs. Over the past 45 years, EPA's oversight and testing program has developed new tools and new techniques to adapt to technology advances, so that we achieve the agency's mission of protecting public health and the environment.

EPA continuously develops new compliance tools and techniques to achieve the Agency's mission: protecting public health and the environment.

EPA's testing and oversight includes standard and non-standard laboratory testing using dynamometers and on-road testing in real-world conditions. Both are necessary as part of an active robust program. This provides a multi-layered oversight approach focused on:

- Testing both pre-production prototypes and production vehicles on the dynamometer, which provides accurate, reliable and repeatable measurements that can be used to compare against the standard, and across vehicle types;
- On-road testing using portable emissions measurement systems (PEMS) that measure emissions during real world driving situations;

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- Laboratory audits ensuring that manufacturer, contract, and other agency test labs conform to testing protocols and data quality standards, so that the data EPA gets from these sources (including the data manufacturers provide to EPA) meet standards and that results can be compared among labs; and
- Holding manufacturers accountable for their actions through rigorous enforcement of the Clean Air Act, which provides a strong deterrence against cheating and helps maintain a level playing field for the vast majority of automakers that comply with laws and regulations fairly.

A strong oversight and compliance program is critical to ensure that the clean air standards that EPA OTAQ sets for vehicles to protect public health actually result in the emissions reductions anticipated. EPA OTAQ will continue to adapt and improve — as we have before — to ensure we deliver on the Agency's mission.

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3. Light-Duty Vehicles

Light-duty vehicles include passenger vehicles such as cars, vans, SUVs, and light trucks. This sector has been subject to increasingly stringent emissions and fuel economy standards since the 1970s. The most recent emissions standards in effect are the Tier 3 vehicle and fuel standards, which EPA adopted in 2014 and which took effect in 2017. The Tier 3 standards reduce NOx, VOC, PM2.5, and air toxics.

3.1 Certification

EPA issued more than 500 certificates to light-duty vehicle original equipment manufacturers (OEMs) for each model year 2014 through 2017, almost reaching 600 in model year 2017. EPA also issued between 131 and 195 certificates for alternative fuel conversions systems for these model years, as shown below in Table 3-1. More information about alternative fuel conversions for light-duty vehicles is found in Section 9.1 of this document.

Table 3-1: Light-Duty Vehicle Sector Certificates of Conformity, Model Years 2014 -2017

Category	MY 2014	MY 2015	MY 2016	MY 2017
Passenger cars and trucks	536	559	574	599
Alternative fuel conversions[30]	147	131	204	195

There were 36 manufacturers that received light-duty vehicle certificates for one or more of these model years. For light-duty vehicles, certificates are issued for each unique combination of test group and evaporative family. Figure 3-1 shows the number of certified light-duty vehicle test groups for model year 2014-2017 by manufacturer. A test group can include multiple models, and in some cases a test group includes both car and truck models. The manufacturers with a smaller number of test groups in each of these figures are grouped together as "Other," (21 manufacturers).[31]

[30] Conversion systems modify vehicles and engines so that they can run on different fuels than the ones for which they were originally designed. For more information, see EPA's webpage at: www.epa.gov/vehicle-and-engine-certification/vehicle-and-engine-alternative-fuel-conversions.

[31] Some of these manufacturers did not certify vehicles in every model year.

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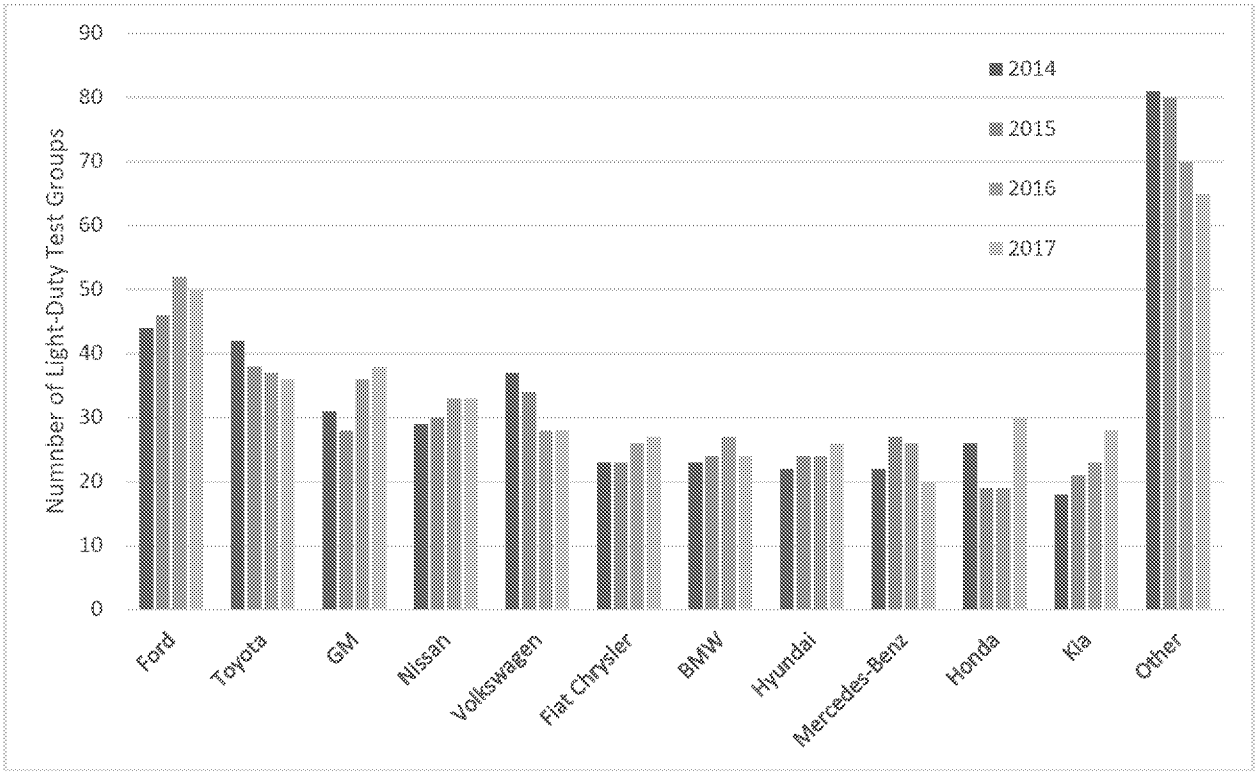

Figure 3-1: Light-Duty Vehicle Test Groups by Manufacturer, Model Year 2014-2017

3.2 Production Volume

The total production volume of model year 2014 -2017 cars and light-duty trucks for the U.S. is presented in Table 3-2 and Figure 3-2 below. As seen in both the table and the figure, the annual production volume of cars has remained around 9 million over this timeframe, while production of trucks has been steadily increasing and is approaching the production volume of cars.[32]

Table 3-2: Light-Duty Vehicle Production Volume of Cars and Trucks for the U.S., Model Years 2014 - 2017

Vehicle Type	MY 2014	MY 2015	MY 2016	MY 2017
Car	9,209,352	9,602,428	9,002,444	8,939,040
Truck	6,304,986	7,138,461	7,277,467	8,072,414
Total Light-Duty	15,514,338	16,740,889	16,279,911	17,011,454

[32] These broad categories of car and light-duty truck can be further disaggregated into vehicle types of sedan/wagon, car SUV, truck SUV, pickup truck, and minivan/van. The first two types, sedan/wagon and car SUV comprise "cars;" the remaining are considered light-duty trucks. Car SUVs are generally smaller two-wheel drive vehicles, while truck SUVs are larger or four-wheel drive vehicles. Further information about market share of these vehicle types can be found in EPA's latest *Automotive Trends Report*, found on EPA's web page at: www.epa.gov/automotive-trends

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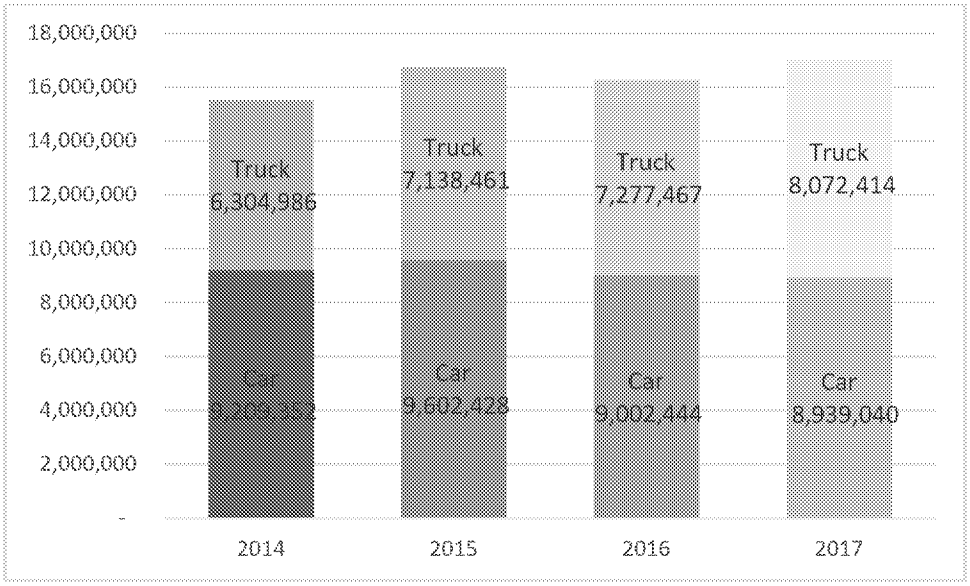

Figure 3-2: Light-Duty Vehicle Production Volume for the U.S., Model Year 2014 - 2017

Figure 3-3 presents the number of model year 2014-2017 cars produced for sale in the U.S. by manufacturer. As before, manufacturers with smaller production volumes in these figures are grouped together as "Other" (19 manufacturers).

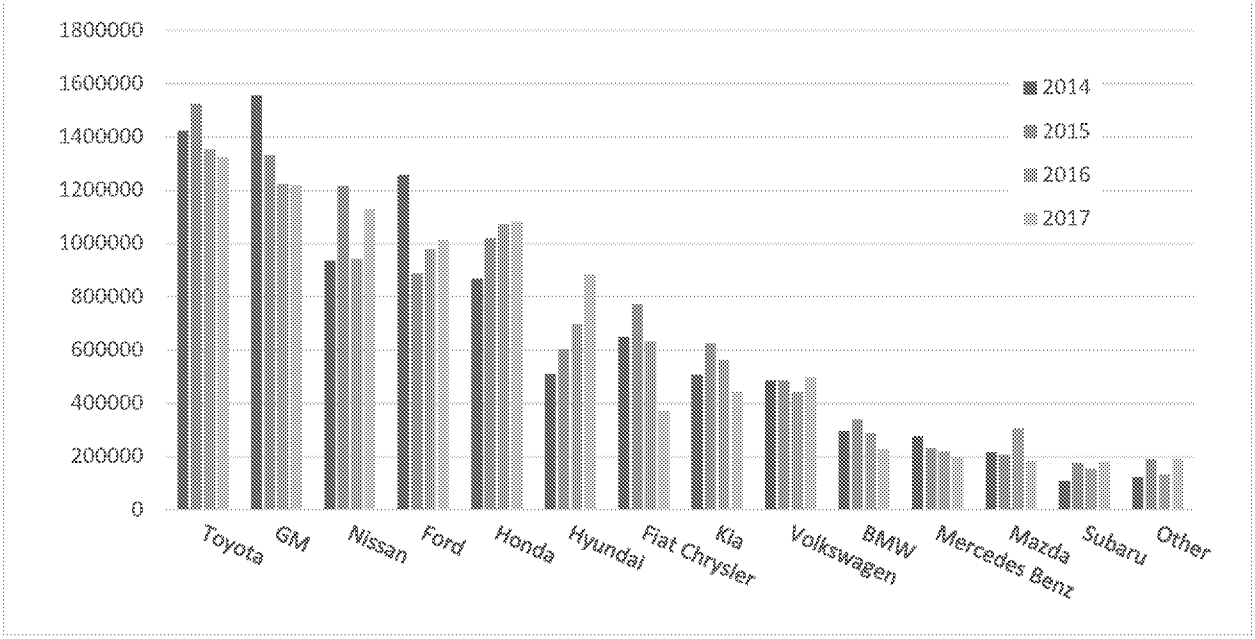

Figure 3-3: Car Production Volume by Manufacturer, Model Years 2014-2017

A comparison of Figure 3-1 and Figure 3-3 shows that the manufacturer that certifies the largest number of car test groups does not necessarily produce the most cars. Light-duty truck production volumes are shown in Figure 3-4, and again, the manufacturer that certifies the largest number of light-duty truck test groups is not necessarily producing the most light-duty trucks. (In this figure, "Other" includes 15 manufacturers.)

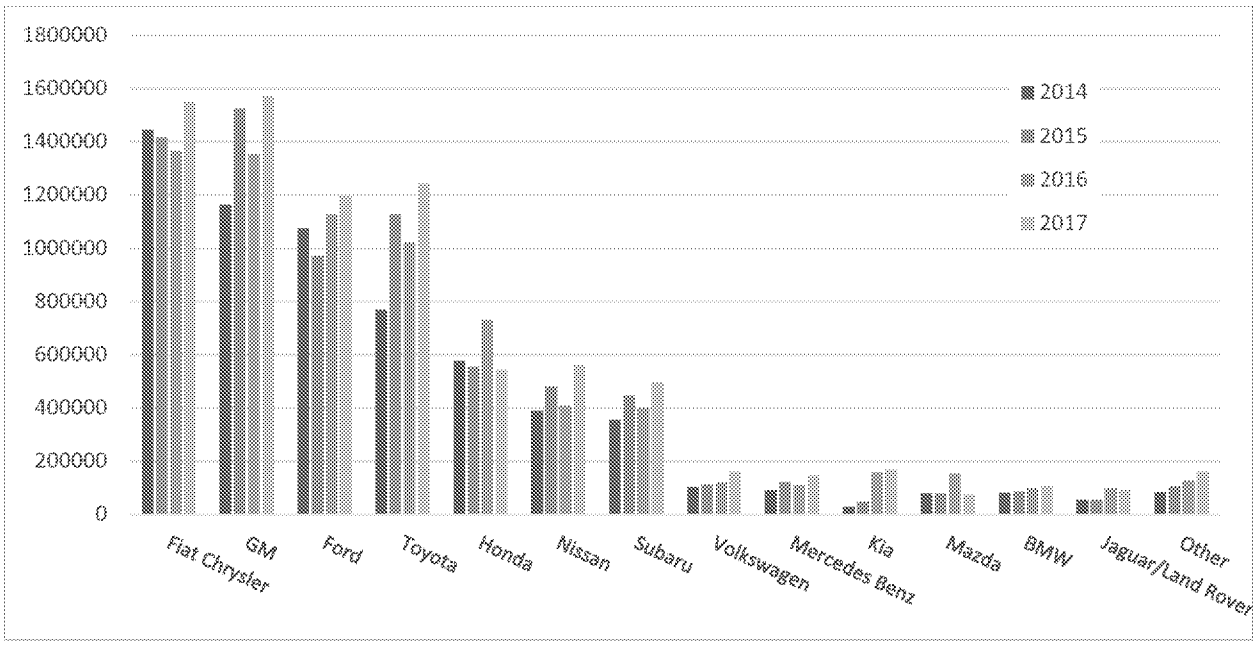

Figure 3-4: Light-Duty Truck Production Volume by Manufacturer, Model Years 2014 - 2017

In contrast to Figure 3-3 and Figure 3-4, which show production volumes for cars and light-duty trucks separately, Figure 3-5 shows the combined production volume of cars and light-duty trucks by manufacturer for just one model year, 2017. As before, manufacturers with smaller production volumes in these figures are grouped together as "Other."

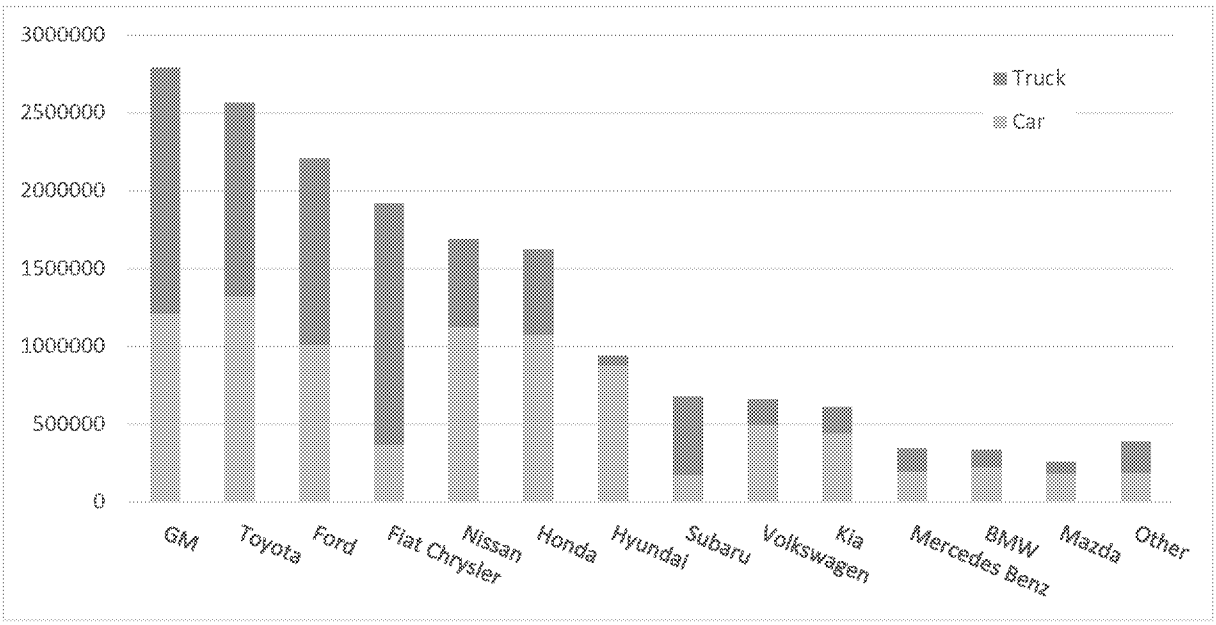

Figure 3-5: Overall Light-Duty Vehicle Production Volume by Manufacturer, Model Year 2017

3.3 Confirmatory Testing

EPA and manufacturers test pre-production vehicles prior to their introduction into commerce to confirm initial manufacturer emission test results. The confirmatory test results become the official certification test results, whether the confirmatory testing is performed by the manufacturer or by EPA. When a vehicle fails a confirmatory test, the manufacturer is allowed one retest to confirm or refute the failure. If the vehicle passes on retest, the retest is deemed the official certification test and the results from the retest stand as the official emission levels for that vehicle. Sometimes a confirmatory test failure can be attributed to problems that render the test vehicle unrepresentative of production vehicles. In those situations, the manufacturer corrects the problem in the test vehicle and retests. In still other cases, failures over the confirmatory test reflect actual engineering problems. These types of failures usually result in manufacturer action to change the vehicle calibration and update the certification application accordingly, resulting in a quantifiable emissions reduction for the vehicles that are ultimately produced. Regardless of whether a confirmatory test failure is due to problems with the test vehicle or problems with the calibration, before EPA will issue a certificate, the problems must be corrected and the vehicle must pass confirmatory testing.

3.4 Fuel Economy Testing

EPA and manufacturers perform confirmatory testing for both emissions and fuel economy validation. Fuel economy test results are the source for information that appears on new vehicle fuel economy labels and that EPA and the U.S. Department of Transportation's National Highway Safety Administration (NHTSA) use to assess compliance with corporate average fuel economy (CAFE) and GHG standards.

The national program for greenhouse gas emissions (GHG) and fuel economy standards for light-duty vehicles was developed jointly by EPA and NHTSA. The greenhouse gas and fuel economy standards apply to passenger cars, light-duty trucks and medium-duty passenger vehicles, and were established in two phases:

- Phase 1, covering model years 2012 through 2016; and
- Phase 2, covering model years 2017-2025.

EPA continues to work with manufacturers to implement these regulations. As part of the 2012 rulemaking establishing the 2017-2025 standards, EPA made a regulatory commitment to conduct a "midterm evaluation" of the longer-term standards for model years 2022-2025. Following conclusion of the mid-term evaluation, on August 24, 2018 NHTSA and EPA proposed to amend the Corporate Average Fuel Economy (CAFE) and greenhouse gas emissions standards for passenger cars and light trucks and establish new standards, covering model years 2021 through 2026. The public comment period for this proposal closed on October 23, 2018.[33]

[33] For additional information, please see EPA's web page at: www.epa.gov/regulations-emissions-vehicles-and-engines/safer-and-affordable-fuel-efficient-vehicles-proposed.

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EPA reports fuel economy test data in an annual Automotive Trends Report, which includes both laboratory test value results and results adjusted for real-world driving conditions.[34] The Automotive Trends Report also includes a section on manufacturer GHG compliance for model years through 2017.

3.5 Durability Testing

The Clean Air Act requires that EPA emission standards apply for the full useful life of the vehicle. Since emissions may degrade as vehicles age and accrue miles, manufacturers must perform durability testing prior to certification to demonstrate that a vehicle will remain compliant for its full useful life, despite any deterioration that may occur over time or distance. EPA regulations establish processes by which manufacturers may demonstrate durability using standard or custom methods. Manufacturers that use their own durability aging procedures must provide EPA with an "equivalency factor" that enables comparison between the proprietary method and the published, standard EPA method. This allows a third party that relies on the EPA method to replicate the manufacturer's method.

EPA has a variety of compliance tools and tests for light-duty vehicles, covering pre-production, production, and post-production time periods.

3.6 In-Use Compliance Testing

Both EPA and manufacturers conduct testing to monitor in-use vehicle emissions. EPA conducts in-use vehicle surveillance testing at the National Vehicle and Fuel Emissions Laboratory in Ann Arbor, Michigan. The purpose of the EPA surveillance program is to assess emissions performance a few years after vehicles enter the fleet. EPA typically recruits two- or three-year-old vehicles from volunteers in southeast Michigan. EPA selects vehicles for surveillance both randomly and based on certification data, manufacturer in-use verification data, vehicle production volume, new technology, and public complaints and inquiries. Generally, EPA tests three vehicles per class. If any of the initial vehicles within a class fails a test, EPA recruits additional vehicles from that class for follow-up testing to determine whether an emissions problem is likely to exist and is not an artifact of the small sample size (or even a single defective vehicle).

EPA also conducts an in-use confirmatory testing program for vehicle classes that merit closer scrutiny. These classes may be identified through failures in either EPA in-use surveillance or manufacturer in-use testing programs.

Table 3-3 shows the vehicle classes selected for EPA surveillance testing in calendar years 2014 – 2017, by model year, manufacturer, and model. Note that some of the classes selected include more than one model, and where that is the case, all the models are listed in the third column of this table.

[34] See EPA's web page at: www.epa.gov/automotive-trends.

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Table 3-3: Vehicle Classes Tested in EPA's In-Use Testing Program, Calendar Years 2014-2017

Model Year	Manufacturer	Model
Surveillance Vehicles		
2008	General Motors	GMC Canyon, Chevrolet Colorado
	General Motors	Saturn Outlook, Buick Enclave, GMC Acadia
	General Motors	Pontiac G6, Chevy Malibu, Saturn Aura
2009	Ford	F150
2010	Ford	Escape
	General Motors	Chevrolet Equinox
	Toyota	Matrix, Scion xB
2011	Ford	Escape
	Ford	F150 FFV
	General Motors	Buick Lucerne, Chevy Impala
	Hyundai	Tucson
	Mitsubishi	Outlander
2012	Audi	A5, A5 Quattro
	BMW	528i
	Chrysler	Fiat 500
	Chrysler	200, Dodge Avenger
	Chrysler	Dodge Grand Caravan
	Ford	Fiesta
	Ford	Mustang
	Ford	Focus
	Ford	F250 Diesel
	Ford	Focus
	General Motors	Buick Lacrosse, Chevy Impala
	General Motors	GMC Yukon/Sierra, Chevrolet Silverado/Tahoe
	General Motors	Chevrolet Cruze
	Honda	CRV
	Hyundai	Sonata
	Kia	Forte
	Kia	Sorento
	Kia	Soul
	Mazda	Mazda5
	Mazda	Mazda3
	Mercedes Benz	C 250, SLK 250
	Mitsubishi	Outlander
	Nissan	Altima, Rogue
	Nissan	Infinity G37, M37
	Nissan	Versa
	Subaru	Forester, Impreza

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Model Year	Manufacturer	Model
	Toyota	Scion XB
	Toyota	Camry
	Toyota	Tacoma
	Volkswagen	Beetle, Golf, Jetta, Passat
	Volvo	S60
2013	Audi	A6 Quattro, A6
	BMW	X5
	Chrysler	Dodge Challenger
	Chrysler	Dodge Dart
	Chrysler	Dodge Ram
	Chrysler	300, Dodge Charger
	Ford	Escape
	Ford	F150
	Ford	Fusion Hybrid, C-Max Hybrid
	Ford	Transit Connect
	General Motors	Cadillac ATS
	General Motors	Chevrolet Equinox
	General Motors	Chevrolet Silverado
	General Motors	Chevrolet Malibu
	Honda	Accord
	Honda	Fit
	Hyundai	Elantra
	Kia	Optima
	Land Rover	Evoque
	Mazda	Mazda3
	Mercedes Benz	GLK350
	Mitsubishi	Outlander
	Porsche	Cayenne
	Subaru Fuji	Forester, Outlook
	Subaru Fuji	Scion FR-S, Subaru BRZ
	Toyota	Corolla
	Toyota	Prius C
	Toyota	Venza, Lexus RX 350
	Volkswagen	Beetle, Golf, Jetta, Passat, Sportwagen
2014	Audi	A4/A5 Quattro
	BMW	Mini Cooper, Countryman, x3, x83
	Chrysler	Dodge Dart, Fiat 500
	Chrysler	Dodge Ram 1500
	Chrysler	Dodge Durango, Jeep Grand Cherokee
	Chrysler	Jeep Compass, Jeep Patriot
	Ford	Flex

Model Year	Manufacturer	Model
	Ford	Fusion
	General Motors	Buick Encore, Chevrolet Traverse, GMC Enclave
	General Motors	Chevrolet Captiva/Equinox, GMC Terrain
	General Motors	Chevrolet Cruze/Malibu
	General Motors	Chevrolet Silverado
	Honda	Civic
	Honda	CRV
	Honda	Odyssey
	Hyundai	Santa Fe, Santa Fe Sport
	Hyundai	Sonata
	Jaguar/Land Rover	Range Rover FFV
	Kia	Sorento
	Kia	Soul
	Mazda	Mazda 6
	Mitsubishi	Mirage
	Nissan	Frontier
	Nissan	Murano
	Toyota	Camry
	Toyota	4 Runner
	Volvo	S60
	Volkswagen	Tiguan
2015	BMW	328i
	FCA	Chrysler Town & Country
	FCA	Dodge Durango, Jeep Grand Cherokee
	FCA	Chrysler 200
	Ford	Focus FFV
	Ford	Fusion, Lincoln MKZ Hybrid
	Ford	F150
	General Motors	Buick LaCrosse, Chevrolet Impala/Cruze
	General Motors	Chevrolet Silverado
	Honda	Accord
	Honda	Acura TLX
	Hyundai	Elantra
	KIA	Sorrento
	Mazda	CX5, CR-5
	Mitsubishi	Outlander, Outlander Sport
	Nissan	Sentra
	Nissan	Versa
	Subaru	Outback
	Toyota	Avalon, Camry, Rav4; Lexus ES350
	Toyota	Sequoia, Tundra

Model Year	Manufacturer	Model
	Volkswagen	Jetta
	Volvo	S60
Confirmatory Vehicles		
2008	General Motors	Cadillac Escalade, GMC Yukon
2009	General Motors	Chevrolet Equinox, Pontiac Torrent
2011	General Motors	Chevrolet Cruze
2012	Honda	Pilot
2013	Chrysler	Chrysler 300, Dodge Challenger, Dodge Charger
2013	Chrysler	Dodge Ram

In addition to its own in-use testing, EPA uses data from the mandatory manufacturer run In-Use Verification Program (IUVP) to monitor in-use light-duty vehicle emissions performance. Manufacturers recruit IUVP vehicles from private citizens across the United States. The vehicles are minimally screened for safety or obvious tampering. The IUVP tests are required at low mileage (between 10,000 and 50,000 miles) and high mileage (greater than 50,000 miles). Manufacturers must complete low mileage IUVP testing one year after the end of production and complete high mileage IUVP testing five years after the end of production, and must report their IUVP data to EPA on a pre-determined schedule. Figure 3-6 shows a sample IUVP test schedule for a model year 2017 vehicle.

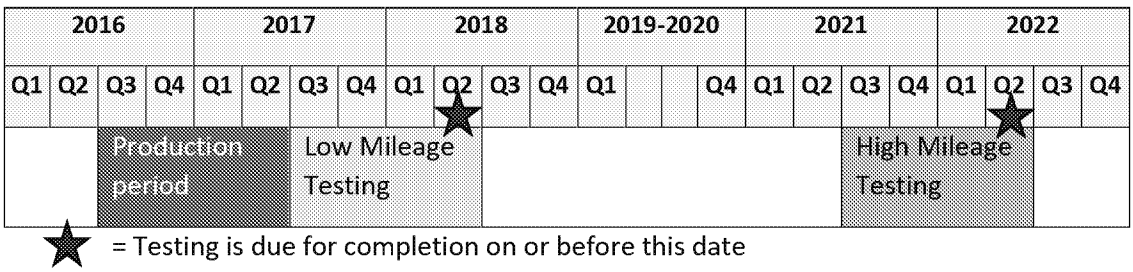

Figure 3-6: Example Timeline for IUVP Testing Process, Model Year 2017 Vehicle

If any manufacturer's failure rates for a particular test group surpass the threshold established in the regulations, that manufacturer must automatically conduct an In-Use Confirmatory Test Program (IUCP) on the test group that has failed. Depending on the results of the IUCP testing, manufacturers might need to recall or implement other remedies for the failing test groups.

IUVP yields significant information about how light-duty vehicles perform in use. The data allow EPA to work with manufacturers to identify potential design issues for future model years and target vehicles that might need additional attention. Table 3-4 shows the total number of vehicles tested in each test procedure and their corresponding failure rates by vehicle model year for all IUVP testing conducted and

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reported through March 2018. The test types include the Federal Test Procedure (FTP), US06 Cycle, the 2-day evaporative emissions test, and the onboard refueling vapor recovery (ORVR) test.[35]

Table 3-4: Light-Duty In-Use Verification Test Volumes and Failure Rates, Calendar Years 2014-2017

Model Year	FTP		US06		2-Day Evap		ORVR	
	Vehicles Tested	Percent Fail	Vehicles Tested	Percent Fail	Vehicles Tested	Percent Fail	Vehicles Tested	Percent Fail
High-Mileage Testing								
2008	1185	8.9%	833	1.1%	157	5.1%	158	5.7%
2009	1103	11.0%	809	1.2%	168	3.6%	164	5.5%
2010	1043	11.3%	759	1.2%	161	4.3%	160	3.1%
2011	1015	12.2%	756	1.1%	160	6.3%	157	7.6%
2012	1025	12.4%	764	0.5%	162	3.7%	170	10.6%
2013	520	12.1%	413	0.7%	79	7.6%	75	10.7%
2014	14	21.4%	13	0.0%	4	0.0%	3	0.0%
Low-Mileage Testing								
2008	647	4.3%	558	0.2%	155	1.3%	153	5.9%
2009	529	3.8%	479	0.4%	132	6.1%	130	6.9%
2010	613	3.4%	545	0.0%	164	1.8%	163	3.1%
2011	606	3.0%	539	0.9%	172	2.9%	170	7.1%
2012	665	3.9%	586	0.3%	182	2.7%	178	10.1%
2013	634	3.8%	575	0.2%	186	7.0%	181	4.4%
2014	649	3.9%	593	0.2%	177	1.7%	182	0.0%
2015	623	4.0%	560	0.2%	178	3.4%	174	0.0%
2016	509	4.5%	476	0.4%	118	1.7%	115	0.0%
2017	13	15.4%	13	0.0%	3	0.0%	3	0.0%

Figure 3-7 shows the confirmatory test information from Table 3-4 in terms of passes and fails by each type of test. Overall, the test results from this program show that the majority of the in-use fleet continues to comply with the emission standards.

[35] ORVR is a vehicle emission control system that captures fuel vapors from the vehicle gas tank during refueling. This requirement was phased in from 1998-2006.

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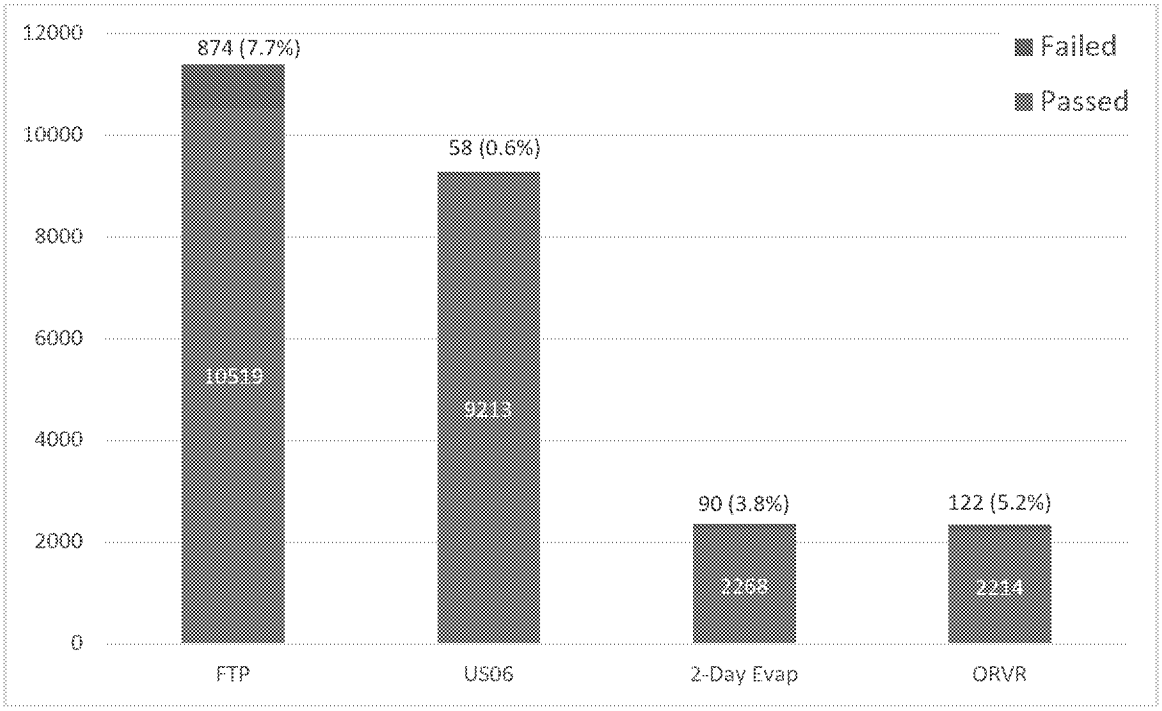

Figure 3-7: In-Use Vehicle Testing by Test, Calendar Years 2014-2017

When IUVP testing identifies potential emissions concerns, EPA and manufacturers work together to implement solutions which may involve voluntary manufacturer action to fix the problem, or, if necessary, an EPA-ordered emissions recall.

In-use testing is an important aspect of EPA's light-duty vehicle compliance program, identifying emissions concerns and resolving them.

3.7 Defect Reporting

Light-duty vehicle manufacturers are required to notify EPA when they learn of emission-related defects in 25 or more vehicles of the same class (e.g., exhaust test group) and category (e.g., manufacturer and model year). Table 3-5 presents the number of defect reports by manufacturer in calendar years 2014 – 2017, and the number of vehicles affected by these defects over the same period of time. Defects reported in this timeframe potentially affected more than 156 million vehicles. A single defect incidence may affect multiple model years of a given vehicle.

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Table 3-5: Light-Duty Vehicle Defect Reports by Manufacturer, Calendar Years 2014-2017

Mfr Name	Reports in CY2014		Reports in CY2015		Reports in CY2016		Reports in CY2017	
	#	Affected Vehicles	#	Affected Vehicles	#	Affected Vehicles	#	Affected Vehicles
Audi	23	889,046	10	145,333	15	285,243	14	635,500
Lamborghini	0	--	1	477	1	729	0	--
Bentley	1	2,208	1	2,903	1	2,184	1	5,355
BMW	14	527,811	33	1,379,393	23	486,492	0	--
Cummins	0	--	0	--	1	564	5	220,740
Fiat Chrysler	21	7,406,614	21	5,109,347	24	1,303,265	36	5,489,460
Ford	16	1,593,480	9	485,503	13	4,436,046	19	3,294,467
FPT Industrial	0	--	9	78,856	0	--	0	--
General Motors	22	3,257,424	34	11,329,891	33	8,790,279	31	15,547,581
Honda	11	5,552,262	19	4,242,279	16	4,337,396	13	2,762,605
Hyundai	19	842,867	15	1,546,059	19	4,518,898	13	3,183,332
Isuzu	0	--	2	2,671	0	--	0	--
Jaguar/Land Rover	2	156,580	8	507,022	7	93,599	2	180,079
Kia	6	2,999,319	16	1,409,239	17	1,938,378	20	2,322,588
Maserati	0	--	1	12,990	1	36,478	0	--
Mazda	8	820,242	5	904,185	3	60,531	1	453,477
Mercedes Benz	12	170,973	10	300,550	8	687,495	28	1,709,613
Mitsubishi	0	--	0	--	5	184,740	0	--
Nissan	7	530,971	10	905,776	11	1,594,905	13	1,792,533
Porsche	12	140,643	12	407,602	4	39,925	29	873,295
Rolls Royce	1	760	0	--	0	--	0	--
Subaru	9	132,699	5	1,036,228	5	77,283	6	1,600,351
Suzuki	0	--	1	19,249	0	--	0	--
Toyota	0	--	32	16,581,936	3	54,700	28	12,083,125
Volkswagen	12	879,214	17	1,095,065	15	634,936	22	611,030
Volvo	3	31,897	2	42,134	3	53,720	3	168,434
Total:	**199**	**25,935,010**	**273**	**47,544,688**	**228**	**29,617,786**	**284**	**52,933,565**

Figure 3-8 below presents the information in Table 3-5 visually.

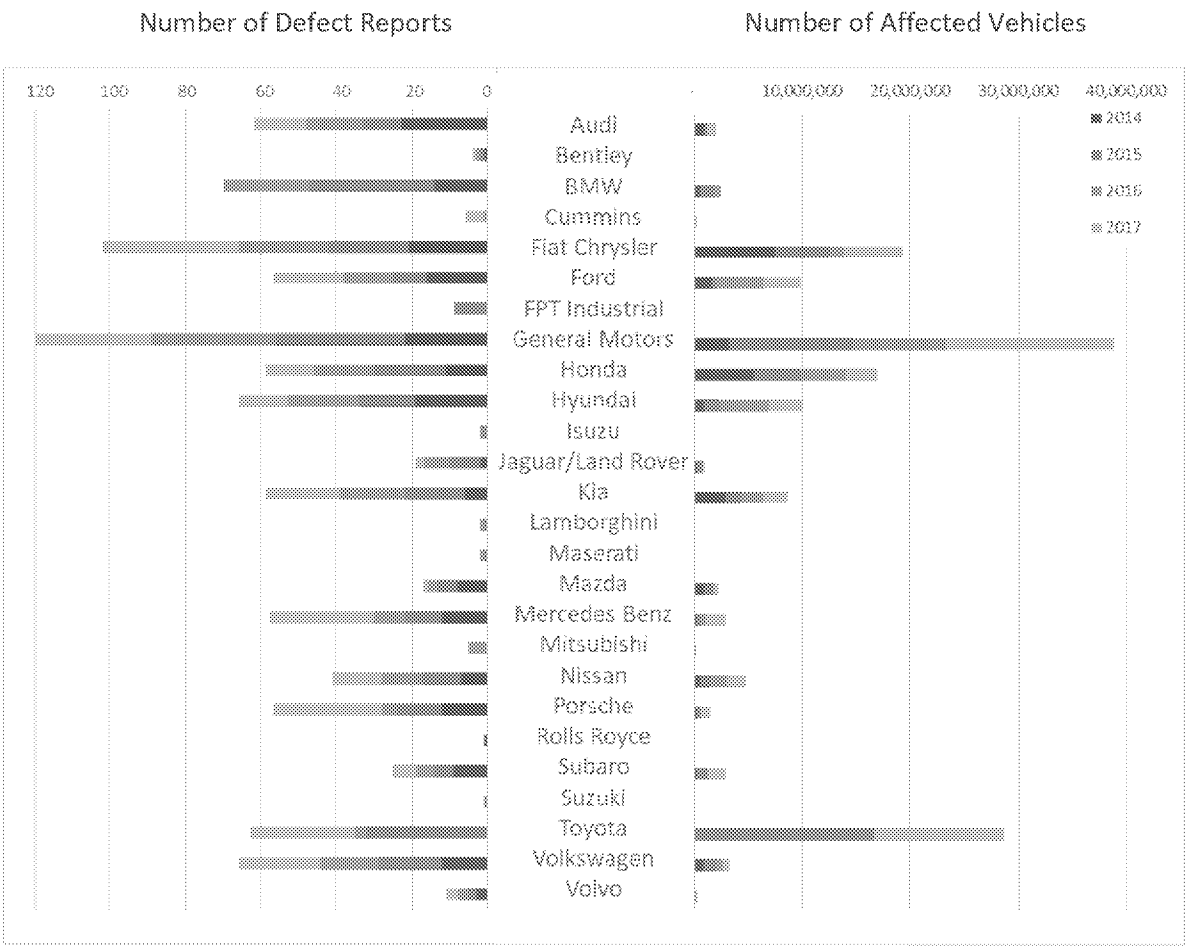

Figure 3-8: Number of Defect Reports (left) and Affected Vehicles (right) by Manufacturer, Calendar Years 2014-2017

Table 3-6 shows the number of defects by defect category, for all the vehicles coved by defect reports in calendar years 2014 – 2017. (The totals for this table are the same as the totals in Table 3-5.)

Table 3-6: Light-Duty Vehicle Defect Reports by Problem Category, Calendar Years 2014-2017

Problem Categories	Reports in CY2014		Reports in CY2015		Reports in CY2016		Reports in CY2017	
	#	Affected Vehicles	#	Affected Vehicles	#	Affected Vehicles	#	Affected Vehicles
Air Inlet/Intake System	5	166,354	5	3,556,267	11	1,986,706	11	1,479,446
Catalyst/Aftertreatment Component/System (non-diesel engine)	11	597,403	1	5,468	5	2,357,444	9	1,406,740
Computer Related (Other than OBD)	27	4,950,098	32	5,282,200	25	2,615,177	33	5,102,613
Crankcase Ventilation Component/System	6	172,382	11	259,553	3	4,441	5	2,624,076

Problem Categories	Reports in CY2014		Reports in CY2015		Reports in CY2016		Reports in CY2017	
	#	Affected Vehicles	#	Affected Vehicles	#	Affected Vehicles	#	Affected Vehicles
Diesel Particulate Filter System	1	121,970	1	270,760	0	--	1	25,617
Electrical, Mechanical and Cooling Systems	12	647,224	45	18,399,384	23	5,321,383	41	9,863,584
Emission Control Information Label	1	367	9	56,476	7	12,016	8	162,395
Evaporative Emissions Systems	15	4,246,626	18	1,194,356	8	2,879,256	21	3,321,952
Exhaust Gas Recirculation (EGR) System	2	26,422	3	123,832	5	100,401	5	1,488,485
Exhaust System	4	296,904	11	1,744,527	8	472,293	5	91,095
Fuel Delivery Component	10	1,689,220	24	2,873,933	24	3,651,433	14	3,478,882
Fuel Delivery System	3	199,635	1	68,839	4	75,445	3	3,355,819
Fuel Tank Component	7	473,847	10	2,133,046	16	419,294	17	1,868,261
Hybrid Vehicle Component/ System	1	85,284	4	474,103	2	2,194	12	216,164
Ignition Component	8	162,154	12	1,321,740	4	69,330	9	1,305,742
Monitoring/ Measuring Sensor/ System	20	2,269,856	23	2,462,767	20	2,504,320	27	2,301,515
NOx Absorber System			2	17,558	1	12,881	1	171,441
NOx Sensor	2	110,655	3	68,407	1	85,993	4	215,482
On-Board Diagnostic (OBD) System	49	8,545,394	40	6,557,661	38	5,772,343	40	4,358,322
On-Board Refueling and Vapor Recovery (ORVR) System	1	19,533	1	80,300	0	--	1	1,148,375
Oxygen Sensor	7	838,022	8	447,608	8	202,739	4	6,750,211
Secondary Air System	0	--	0	--	2	13,883	6	2,142,815
Selective Catalytic Reduction System	5	142,694	5	112,334	9	455,466	5	37,920
Turbocharger/ Supercharger	2	172,966	4	33,569	4	603,348	2	16,613
Total	**199**	**25,935,010**	**273**	**47,544,688**	**228**	**29,617,786**	**284**	**52,933,565**

3.8 Recall Reporting

Table 3-7 shows the number of light-duty vehicle recalls by vehicle manufacturer in calendar years 2014 – 2017 and the number of vehicles affected by the recall. Because a recall usually covers a single, specific condition, a vehicle with multiple emissions problems may be subject to multiple recalls. Therefore, the number of affected vehicles in Table 3-7 and Table 3-8 could include vehicles that have been recalled more than once. Similarly, there is not a simple correlation between the number of defect reports, recalls, and the number of vehicles that are recalled. A manufacturer may identify a defect that is not significant enough to warrant a recall. On the other hand, a manufacturer could have a few major defects that evolve into major recalls affecting large portions of their product line.

Table 3-7: Light-Duty Vehicle Recalls by Manufacturer, Calendar Years 2014-2017

MFR Name	Recalls in 2014		Recalls in 2015		Recalls in 2016		Recalls in 2017	
	#	Affected Vehicles	#	Affected Vehicles	#	Affected Vehicles	#	Affected Vehicles
Audi	4	279,384	3	280,552	2	19,121	1	11,088
BMW	1	367	9	401,536	2	25,322	27	1,441,759
Cummins	1	127,483	1	33,677	1	135,824	1	88,419
Fiat Chrysler	6	261,266	12	697,181	11	644,218	12	653,494
Ford	6	1,143,213	11	1,095,357	6	1,673,457	9	248,183
FPT Industrial	0	--	1	10,458	1	12,930	0	--
General Motors	4	101,940	9	762,691	5	201,689	6	250,935
Honda	2	971,247	6	88,318	4	991,456	6	232,665
Hyundai	1	62,586	0	--	2	79,905	1	260,792
Jaguar/Land Rover	1	115,510	1	19,269	1	1,934	0	--
Kia	1	26,864	0	--	4	146,961	1	61,023
Lamborghini	0	--	0	--	0	--	1	729
Maserati	0	--	0	--	1	23,479	0	--
Mazda	4	150,627	2	86,064	4	315,810	1	69,447
Mercedes Benz	0	--	0	--	1	73,696	0	--
Nissan	3	79,428	3	87,076	4	329,461	4	504,376
Porsche	0	--	0	--	0	--	1	2,299
Subaru	0	--	0	--	4	148,847	0	--
Suzuki	0	--	1	19,250	0	--	0	--
Toyota	6	5,487,623	1	170,172	8	996,401	11	694,351
Volkswagen	4	198,735	4	439,980	4	148,772	4	418,395
Total	**44**	**9,006,273**	**64**	**4,191,581**	**65**	**5,969,283**	**86**	**4,937,955**

Table 3-8 lists categories of defects that were corrected by recalls in the years 2014 – 2017. The totals in this table are the same as the totals in Table 3-7. EPA established the defect categories primarily for internal tracking purposes to identify potential, industry-wide problems with a particular component or technology.

Table 3-8: Light-Duty Vehicle Recalls by Problem Category, 2014 – 2017

Problem Category	2014		2015		2016		2017	
	#	Affected Vehicles	#	Affected Vehicles	#	Affected Vehicles	#	Affected Vehicles
Air Inlet/Intake System	3	1,175,761	0	--	4	467,978	3	451,728
Catalyst/Aftertreatment Component/System (non-diesel engine)	3	122,251	3	183,761	0	--	4	204,999
Computer Related (Other than OBD)	8	238,358	12	1,722,786	8	1,316,777	5	501,303
Crankcase Ventilation Component/System	2	78,871	3	207,558	2	2,083	3	719,538
Diesel Particulate Filter System	0	--	1	2,573	0	--	0	--
Electrical, Mechanical and Cooling Systems	7	4,896,100	7	323,757	3	331,627	8	744,537
Emission Control Information Label	1	367	7	46,100	7	35,467	5	127,518
Evaporative Emissions Systems	0	--	4	471,062	5	552,659	5	293,324
Exhaust Gas Recirculation (EGR) System	0	--	1	99,380	3	680,458	2	415,314
Exhaust System	0	--	1	2,471	1	12,540	2	49,840
Fuel Delivery Component	3	1,020,060	5	106,579	4	581,161	10	161,407
Fuel Delivery System	0	--	6	167,158	1	191,857	2	2,725
Fuel Tank Component	2	18,767	4	85,599	7	76,566	6	26,538
Hybrid Vehicle Component/System	2	794,284	0	--	2	109,740	6	22,508
Ignition Component	0	--	0		1	29,214	3	83,246
Monitoring/Measuring Sensor/System	7	238,102	3	608,060	3	577,119	1	31,824
NOx Sensor	0	--	0		1	91,442	1	38,640
On-Board Diagnostic (OBD) System	4	263,394	7	164,737	5	584,406	12	660,124
Oxygen Sensor	0	--	0	--	1	24,100		
Secondary Air System	0	--	0	--	1	100,021	2	155,154
Selective Catalytic Reduction System	0	--	0	--	5	179,286	4	144,115
Turbocharger/Supercharger	2	159,958	0	--	1	24,782	2	103,573
Total	**44**	**9,006,273**	**64**	**4,191,581**	**65**	**5,969,283**	**86**	**4,937,955**

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3.9 Averaging, Banking, and Trading (ABT) Programs

During the time period covered by this report, manufacturers certified vehicles to both EPA's Tier 3 vehicle standards, which began to take effect in 2017, and EPA's Tier 2 vehicle standards. The Tier 2 regulation marked the first time that SUVs and other light-duty trucks were subject to the same national pollution standards as cars, and this is also a feature of Tier 3 vehicle standards.[36]

The Tier 2 regulation gives manufacturers a choice of eight emission bins to which they can certify. Lower bin numbers reflect more stringent emission standards. The Tier 2 ABT program allows manufacturers to use sales-weighted averaging to certify groups of vehicles to different bin levels, as long as the fleet as a whole on average meets Bin 5 standards each year.

In Tier 3, the bins are named using their corresponding NMOG+NOx limit in mg/mi. The highest emission bin, Bin 160 (NMOG+NOx = 160 mg/mi) is equivalent to Tier 2 Bin 5. There were other important changes from Tier 2 to Tier 3, and EPA's web page provides further information.

Table 3-9 shows the percentage of exhaust test groups by emission certification bin for model years 2014-2017. In model year 2017, 89% of the vehicle test groups were certified to Tier 3 instead of Tier 2; 99% of the vehicle test groups were certified to Tier 2 Bin 5 or better (again, because the highest Tier 3 bin, Bin 160, is equivalent to Tier 2 Bin 5).

Table 3-9: Percentage of Exhaust Test Groups by Certification Bin, Model Years 2014 - 2017

Standard	Bin	MY 2014	MY 2015	MY 2016	MY 2017
Tier 2	Bin 1	3%	3%	4%	0%
	Bin 2	3%	2%	1%	
	Bin 3	9%	8%	7%	0%
	Bin 4	13%	13%	14%	2%
	Bin 5	70%	71%	65%	10%
	Bin 6			0%	
	Bin 7	0%			
	Bin 8	3%	2%	1%	1%
Tier 3	Bin 0			0%	5%
	Bin 20				
	Bin 30			3%	14%
	Bin 50				0%
	Bin 70			2%	14%
	Bin 125			3%	46%
	Bin 160				9%
Total		**100%**	**100%**	**100%**	**100%**

[36] For more information, see EPA's webpage at: www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-control-air-pollution-new-motor-vehicles-tier

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Figure 3-9 through Figure 3-11 present the average certification levels for NOx, NMOG, and CO respectively for Tier 2 Bin 5 for the manufacturers with the largest production volumes (as shown in Figure 3-5). The lower the certification levels relative to the standard, which represents 100%, the greater the compliance margin. In other words, a 30% compliance margin means that vehicle emissions are 30% lower than the standard whereas a 70% compliance margin means that emissions are 70% lower than the standard. Note that the y-axis for these three figures is not constant. Also note that in 2014, the label "Volkswagen" includes only Volkswagen vehicles; after 2015, "Volkswagen" is used to refer to the Volkswagen Group, which includes other brands. Several manufacturers do not have data for model year 2017; these manufacturers certified their model year 2017 vehicles to the Tier 3 standards instead of Tier 2.

Averaging, banking, and trading programs give manufacturers flexibility in how they satisfy clean air emission standards.

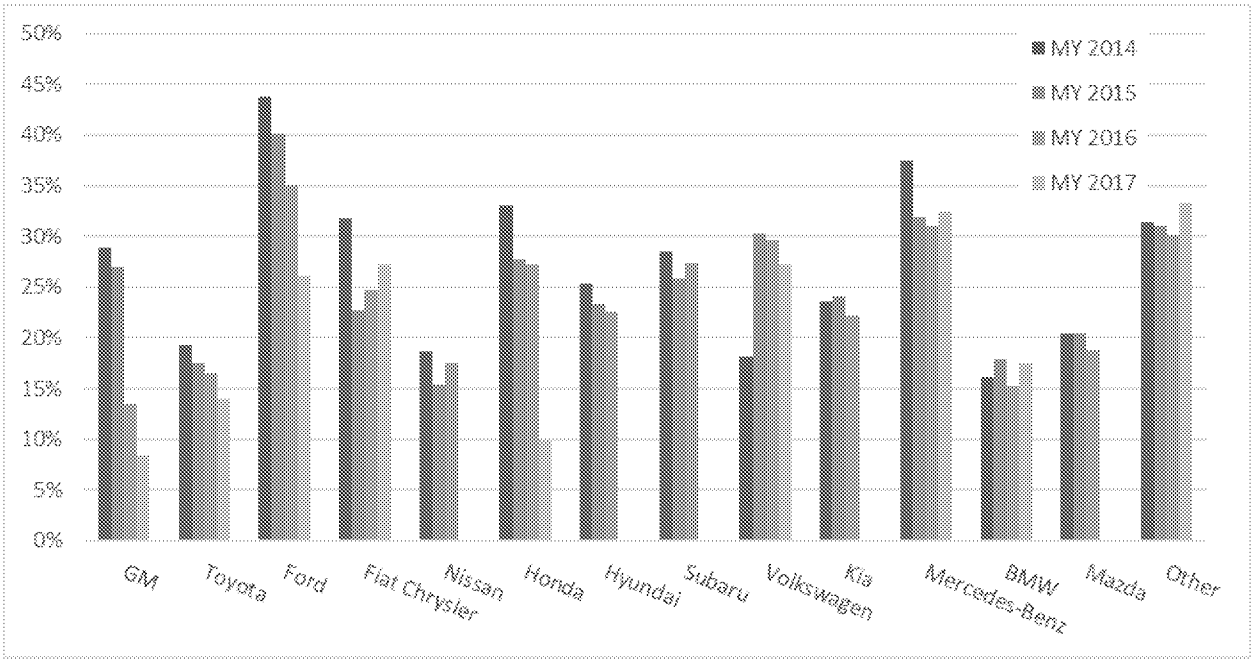

Figure 3-9: Tier 2 Bin 5 NOx Certification Levels by Manufacturer, Model Years 2014 - 2017

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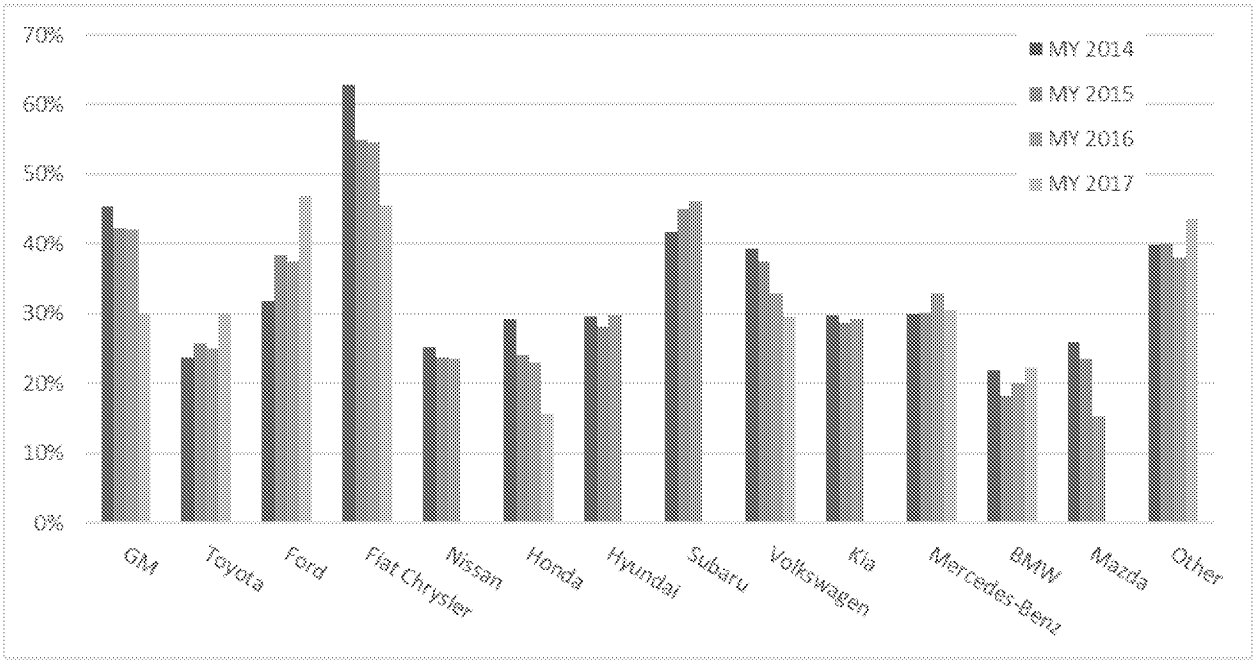

Figure 3-10: Tier 2 Bin 5 NMOG Certification Levels by Manufacturer, Model Years 2014 - 2017

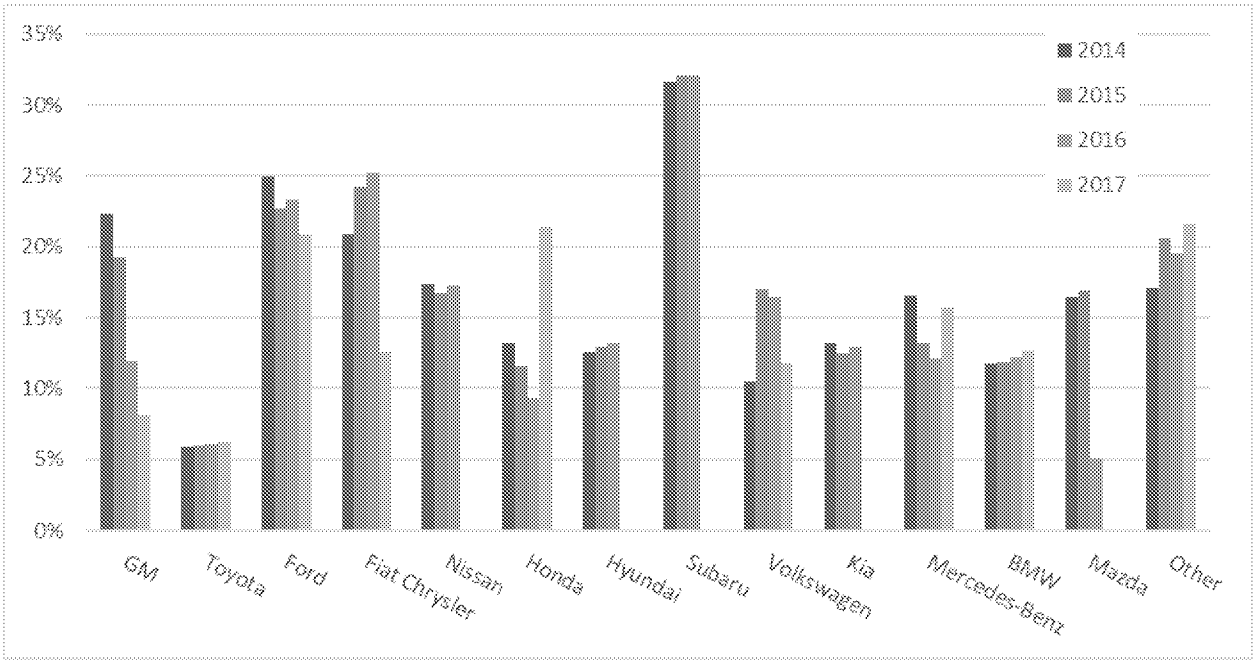

Figure 3-11: Tier 2 Bin 5 CO Certification Levels by Manufacturer, Model Years 2014 -2017

4. Highway Motorcycles

4.1 Certification

Highway and off-highway motorcycles are subject to different regulations and emission standards. This section covers highway motorcycles; off-highway motorcycles are covered in Section 8, Recreational Vehicles.

Table 4-1 presents the number of certified highway motorcycle engine families, which is equivalent to the number of certificates EPA issued, by class, for model years 2014 - 2017. Class refers to engine capacity, measured in terms of volume displaced by the motor in cubic centimeters (cc). The larger a motorcycle's cc, the more power it has. For example, small scooters belong to Class Ia. The largest class, Class III, includes all motorcycles larger than 279 cc, the largest of which can be in the range of 2000 cc.

Table 4-1: Highway Motorcycle Engine Families by Class, Model Years 2014-2017

Highway Motorcycle Category	Number of Engine Families			
	MY 2014	MY 2015	MY 2016	MY 2017
Class Ia (<50cc)	40	35	30	33
Class Ib (50 - 169cc)	49	43	43	46
Class II (170 -279cc)	34	31	30	26
Class III (>279cc)	166	179	185	181
Battery Electric Motorcycles	0	1	5	13
Total	**289**	**289**	**293**	**299**

Table 4-2 presents the number of certified highway motorcycle engine families by manufacturer for model year 2014 – 2017. The totals in this table are the same as in Table 4-1. The manufacturers that certified a smaller number of engine families across these model years (including the battery electric manufacturers) are grouped together as "Other."

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Table 4-2: Highway Motorcycle Engine Families by Manufacturer, Model Years 2014 - 2017

Manufacturer	Number of Engine Families			
	MY 2014	MY 2015	MY 2016	MY 2017
American Honda Motor Co., Inc.	25	22	24	24
BMW	9	9	8	7
Ducati North America, Inc.	12	13	14	16
Harley-Davidson Motor Company	8	11	11	12
Kawasaki Motors Corp., U.S.A.	16	16	17	19
KTM North America, Inc.	6	7	8	12
KYMCO USA	10	9	8	7
MV Agusta USA, LLC	6	6	7	8
Piaggio Group Americas, Inc.	20	21	23	20
Suzuki Motor Corporation	19	21	22	21
Triumph Motorcycles America Ltd	10	11	13	15
Yamaha Motor Corporation	27	29	28	24
Other (>90 manufacturers)	121	114	110	114
Total	**289**	**289**	**293**	**299**

Table 4-3 presents the number of manufacturers that obtained these certificates by class. In every model year 2014 – 2017, there were more than 100 manufacturers. Comparing highway motorcycle and light-duty sectors, there is less consolidation in motorcycle manufacturers: a larger number of manufacturers (more than 100 in each year, compared to 36 for light-duty vehicles), certifying a smaller number of distinct families (less than 300 engine families each year, compared to more than 500 unique exhaust test group/evaporative families for light-duty vehicles).

EPA issues certificates to more than 100 different highway motorcycle manufacturers.

Table 4-3: Number of Motorcycle Manufacturers by Class, Model Years 2014 - 2017

Highway Motorcycle Category	Number of Manufacturers			
	MY 2014	MY 2015	MY 2016	MY 2017
Class Ia (<50cc)	33	28	24	25
Class Ib (50 - 169cc)	33	28	30	31
Class II (170 -279cc)	24	19	18	15
Class III(>279cc)	35	39	36	35
Battery Electric Motorcycles	0	1	4	11
Total	**125**	**115**	**112**	**117**

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4.2 Production Volume

Figure 4-1 below shows the numbers of model year 2014 -2017 motorcycles produced for the U.S. In these years there was a downward trend: about 62,000 fewer model year 2017 motorcycles were sold compared to model year 2014. (Note the y-axis of this figure begins at 300,000 rather than zero.)

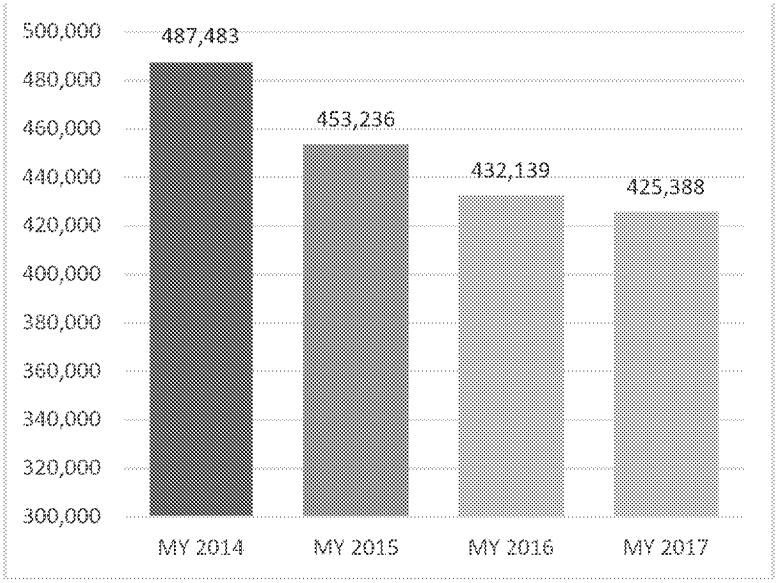

Figure 4-1: Highway Motorcycle Production Volume for the U.S., Model Years 2014 -2017

Table 4-4 and Figure 4-2 below show model year 2017 production volume – the yellow bar in Figure 4-1 – by motorcycle class. As illustrated by the figure, nearly three quarters of the model year 2017 motorcycles produced for sale in the U.S. were Class III motorcycles. Less than one percent were electric motorcycles.

Table 4-4: U.S. Motorcycle Production by Class, Model Year 2017

Highway Motorcycle Category	Production Volume	Percent of Total
Class Ia (<50cc)	53,348	13%
Class Ib (50 - 169cc)	39,439	9%
Class II (170 -279cc)	17,371	4%
Class III (>279cc)	313,929	74%
Battery Electric	1,301	<1%
Total	425,388	100%

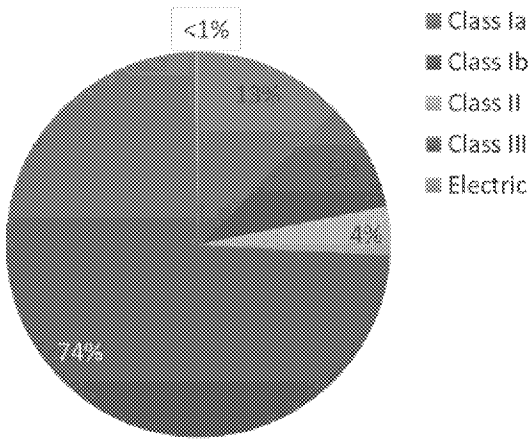

Figure 4-2: U.S. Motorcycle Production by Class, Model Year 2017

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4.3 Defect Reporting

Highway motorcycle manufacturers are required to notify EPA when they learn of the existence of emission-related defects in 25 or more vehicles of the same class (e.g., engine family) and category (e.g., manufacturer, model year). Table 4-5 includes the number of defect reports for highway motorcycles in calendar years 2014 – 2017 by manufacturer; and Table 4-6 provides this information by problem category. There were no defects reported in 2014.

Table 4-5: Highway Motorcycle Defect Reports by Manufacturer, Calendar Year 2014 - 2017

Manufacturer	Number of Defect Reports in Calendar Year		
	2015	2016	2017
Harley Davidson	1	0	2
Honda	0	2	2
Suzuki	1	2	1
Victory Motorcycle/Polaris	1	0	0
Total:	**3**	**4**	**5**

Table 4-6: Highway Motorcycle Defect Reports by Problem Category, Calendar Years 2014 - 2017

Problem Category	Number of Defect Reports in Calendar Year:		
	2015	2016	2017
Electrical, Mechanical & Cooling Systems	0	2	1
Engine Emission Control Information Label	0	0	1
Catalytic Converter	1	0	0
Exhaust System	1	0	0
Fuel Delivery Component	1	2	2
Owners' Manual	0	0	1
Total:	**3**	**4**	**5**

4.4 Recall Reporting

The same three manufacturers issued recalls for highway motorcycles in calendar years 2014 – 2017. There were no recalls in calendar year 2014. Table 4-7 lists these recalls by manufacturer, and Table 4-8 lists them by problem category.

Table 4-7: Highway Motorcycle Recalls by Manufacturer, Calendar Years 2014 - 2017

Manufacturer	2015		2016		2017	
	Recalls	Affected Engines	Recalls	Affected Engines	Recalls	Affected Engines
Harley Davidson	1	31	0	--	0	--
Honda	0	--	1	17,643	1	8,059
Suzuki	1	1,019	2	6,288	1	120
Total:	**2**	**1,050**	**3**	**23,931**	**2**	**8,179**

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Table 4-8: Highway Motorcycle Recalls by Problem Category, Calendar Years 2014 -2017

Problem Category	2015		2016		2017	
	Recalls	Affected Engines	Recalls	Affected Engines	Recalls	Affected Engines
Electrical, Mechanical & Cooling Systems	0	--	2	6,288	0	--
Engine Emission Control Information Label	0	--	0	--	1	120
Exhaust System	1	1,019	0	--	0	--
Fuel Delivery Component	1	31	1	17,643	0	--
Owners' Manual	0	--	0	--	1	8,059
Total:	**2**	**1,050**	**3**	**23,931**	**2**	**8,179**

5. Heavy-Duty Highway Engines

Heavy-duty highway engines are used in highway vehicles such as trucks and buses that are more than 8,500 pounds in gross vehicle weight rating (GVWR, the maximum operating weight of a vehicle as specified by the manufacturer.)

5.1 Certification

Table 5-1 below shows the number of certificates for the heavy-duty highway engine sector; it repeats a portion of Table 2-1. As shown in the table, EPA issued 147, 187, 186, and 222 heavy-duty highway certificates for model year 2014-2017, respectively. These include alternative fuel conversion and evaporative emissions systems certificates.

Table 5-1: Heavy-Duty Highway Engine Certificates, Model Years 2014 - 2017

Category	MY 2014	MY 2015	MY 2016	MY 2017
Compression ignition (diesel)	30	32	34	41
Spark ignition (mostly gasoline)	10	14	12	15
Tractors and vocational vehicles	66	97	103	126
Alternative fuel conversions	31	31	25	22
Evaporative emissions systems	10	13	12	18
Total	**147**	**187**	**186**	**222**

In Table 5-1, EPA distinguished certificates for alternative fuel conversions from those for compression ignition or spark ignition engines. However, this distinction is not made in Tables 5-2 through 5-5. These tables present the number of heavy duty highway compression ignition engine families (in Tables 5-2 and 5-3), and the number of heavy duty highway spark ignition engine families (in Tables 5-4 and 5-5), that include the alternative fuel conversions for these engine types. Thus the total number of engine families in these tables is larger than the corresponding row for the category in Table 5-1.

Table 5-2 and Table 5-3 present the number of model year 2014-2017 heavy-duty highway compression ignition engine families certified, by service class and by manufacturer, respectively.

Table 5-2: Heavy-Duty Highway Compression Ignition Engine Families by Service Class, Model Years 2014 - 2017

Heavy-Duty Engine Service Class	Number of Engine Families			
	MY 2014	MY 2015	MY 2016	MY 2017
Light heavy-duty diesel	7	5	9	7
Medium heavy-duty diesel	8	10	11	14
Heavy heavy-duty diesel	15	17	16	21
Urban bus	3	4	4	0
Total	**33**[37]	**36**	**40**	**42**

[37] This number does not match the number of heavy-duty highway engine certificates for compression ignition engines in Table 5-1 and Table 5-3 due to a manufacturer data entry error. This type of error is no longer possible as a result of EPA's update to the system used to enter this data.

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Table 5-3: Heavy-Duty Highway Compression Ignition Engine Families by Manufacturer, Model Years 2014 - 2017

Heavy-Duty Highway Compression Ignition Engine Manufacturer	Number of Engine Families			
	MY 2014	MY 2015	MY 2016	MY 2017
Clean Air Power	0	1	0	0
Cummins Inc.	14	16	18	18
Detroit Diesel Corporation	4	4	3	4
Ford Motor Company	2	2	5	3
FPT Industrial S.p.A.	2	0	2	2
General Motors LLC	0	1	1	0
Hino Motors, Ltd	3	3	3	3
Isuzu Motors Limited	1	1	1	2
Navistar, Inc.	4	3	2	3
NGV Motori, USA, LLC	0	0		1
PACCAR Inc	1	1	2	3
Propane Fuel Technologies LLC	0	1	0	0
Volvo Powertrain North America A Division of Mack Trucks, Inc.	0	0	0	3
VPT	3	3	3	0
Total	**34**	**36**	**40**	**42**

Table 5-4 and Table 5-5 present the number of model year 2014-2017 heavy-duty highway spark ignition engine families certified, by service class and by manufacturer, respectively.

Table 5-4: Heavy-Duty Highway Spark Ignition Engine Families by Service Class, Model Years 2014-2017[38]

Heavy-Duty Engine Service Class	Number of Engine Families			
	MY 2014	MY 2015	MY 2016	MY 2017
Heavy-duty gas 1 (≤ 14K lbs)	10	8	1	0
Heavy-duty gas 2 (>14K lbs)	26	31	27	29
Heavy-duty Otto Cycle engines for vehicles of all GVWR	5	4	11	7
Total	**41**	**43**	**39**	**36**

[38] For MY 2014, 2015, and 2016, the number of certificates for spark ignition engines was fewer than then number of spark ignition engine families, because some vehicles between 8,500 – 14,000 lbs are chassis certified and were included in light-duty vehicle data.

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Table 5-5: Heavy-Duty Highway Spark Ignition Engine Families by Manufacturer, Model Years 2014-2017

Heavy-Duty Highway Spark Ignition Engine Manufacturer	MY 2014	MY 2015	MY 2016	MY 2017
AGA Systems, LLC	0	1	1	1
Auto Gas America	4	0	0	0
BAF Technologies	2	2	0	0
Bi-Phase Technologies, LLC.	3	2	1	0
Blossman Services, Inc.	1	3	0	1
Chrysler Group LLC	1	1	1	0
CleanFuel USA Inc.	2	2	1	2
Encore TEC LLC	0	0	6	4
FCA US LLC	0	0	0	1
Ford Motor Company	5	6	2	2
General Motors LLC	3	3	1	1
Greenkraft Inc.	4	5	4	5
Icom North America LLC	2	2	0	4
IMPCO Technologies, Inc.	4	4	5	2
Landi Renzo USA Corporation	4	5	4	3
NGV Motori	2	0	0	0
OMNITEK	0	1	0	0
PARNELL USA, INC	0	0	3	0
Power Solutions International, Inc.	0	2	4	4
Powertrain Integration, LLC	0	0	0	1
Roush Industries, Inc.	2	4	3	3
Westport Dallas, Inc	0	0	2	2
Westport Power Inc.	1	0	0	0
Total	**40**	**43**	**38**	**36**

Figure 5-1 and Figure 5-2 present the number of model year 2014 – 2017 compression ignition and spark ignition engine families by each heavy-duty engine manufacturer.

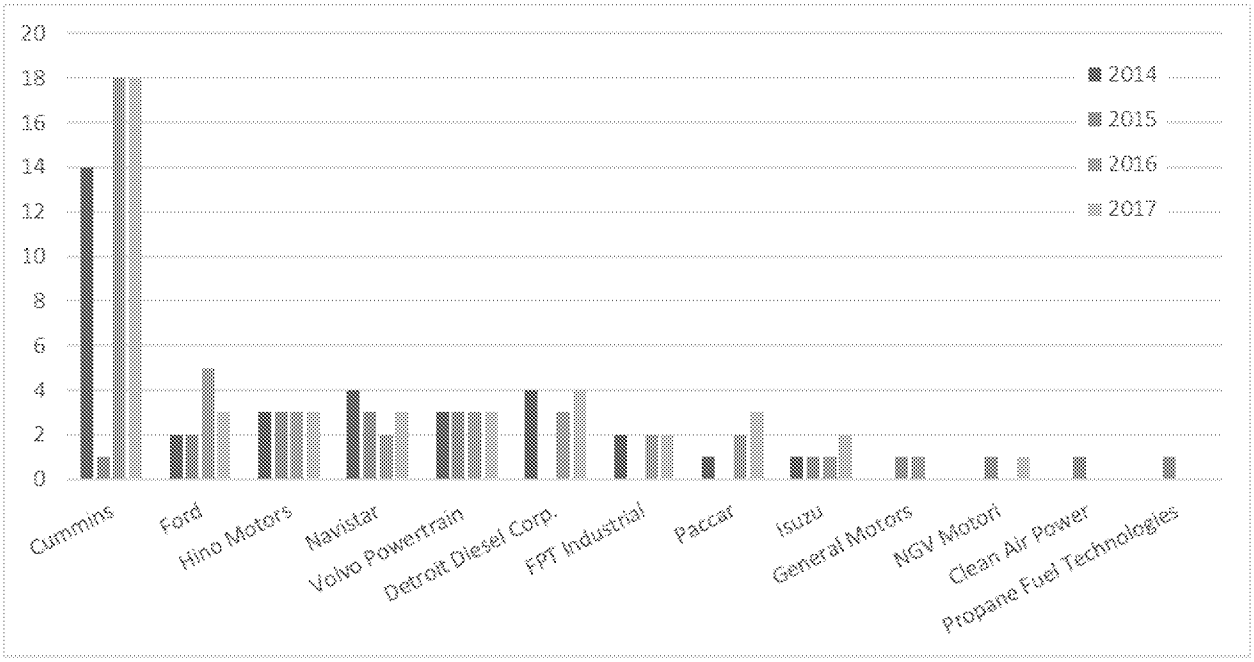

Figure 5-1: Heavy-Duty Highway Compression Ignition Engine Families by Manufacturer, Model Year 2014-2017

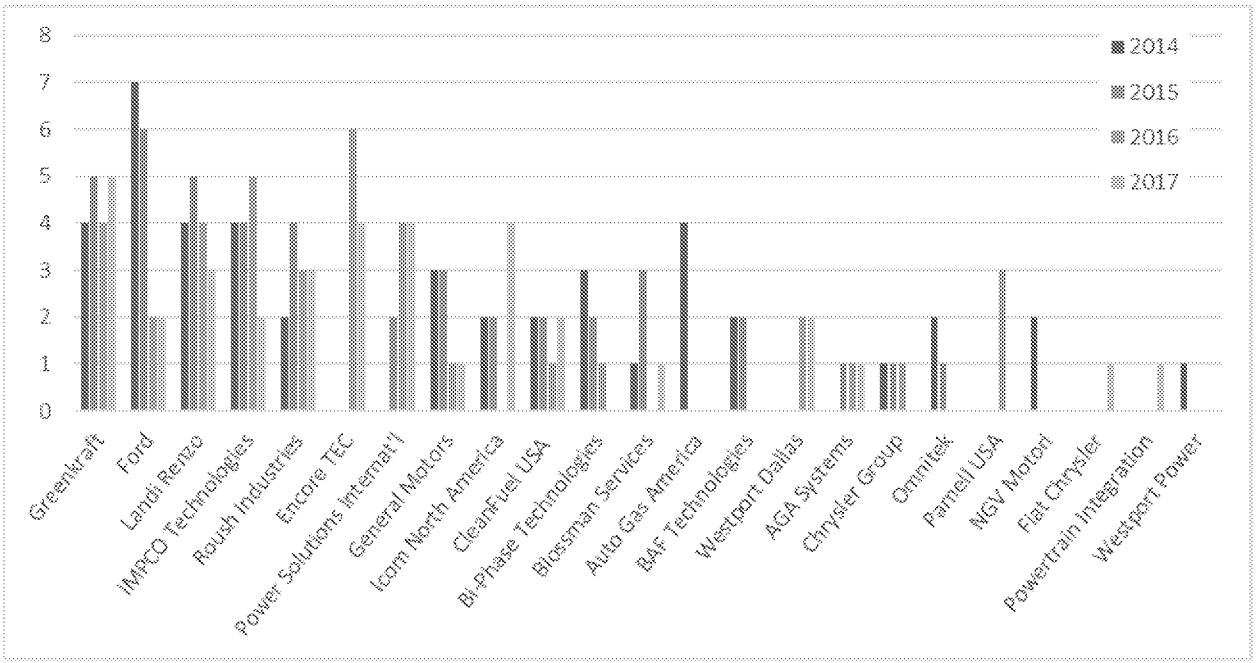

Figure 5-2: Heavy-Duty Highway Spark Ignition Engine Families by Manufacturer, Model Year 2014-2017

5.2 In-Use Compliance Testing

As is the case for light-duty vehicles, EPA relies on both internal and manufacturer testing programs to assess compliance with in-use emission standards for heavy-duty vehicles.[39] Heavy-duty in-use testing differs significantly from light-duty in-use testing. For light-duty vehicles, the test procedures used to measure emissions are the same for both certification and in-use testing. However, heavy-duty engines undergo certification testing in the laboratory, whereas in-use testing may be conducted over the road. In other words, the heavy-duty vehicle regulations do not require manufacturers to test in-use engines on a laboratory dynamometer, as they must for certification. Instead, the regulations require manufacturers to measure the percentage of time that a vehicle exceeds certain emission thresholds under real-world driving conditions using portable devices that monitor emissions of hydrocarbons, carbon monoxide, nitrogen oxides, and particulate matter. Heavy-duty manufacturers use portable equipment to measure in-use emissions while a vehicle is being driven on the road in actual customer fleet applications, instead of removing the engine from the vehicle to conduct laboratory testing on an engine dynamometer.

EPA conducts surveillance testing to check heavy-duty compliance with regulations for their entire useful life.

EPA also conducts a surveillance program to assess the emissions performance of heavy-duty vehicles near the end of their useful life. The program utilizes engine dynamometer testing (where the engine is removed from the vehicle), chassis dynamometer testing on EPA's heavy-duty chassis dynamometer, and portable emissions measuring equipment. The program is currently focused on medium heavy-duty and heavy heavy-duty compression ignition engines.[40]

5.3 Defect Reporting

Table 5-6 provides the number of defect information reports that heavy-duty highway engine manufacturers submitted during calendar years 2014 – 2017. Table 5-7 shows defect information for the same years by problem category. Note that both of these tables include information about both diesel and spark ignition heavy duty engines.

[39] Current regulations mandate a manufacturer-run heavy-duty in use test program for compression ignition engines. The regulations do not require manufacturer in-use testing for heavy duty spark ignition engines at this time.

[40] Definitions of medium heavy-duty and heavy heavy-duty compression ignition engines are found in the regulation at 40 CFR 1036.140.

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Table 5-6: Heavy-Duty Highway Engine Defect Reports by Manufacturer, Calendar Years 2014 - 2017

Heavy-Duty Highway Engine Manufacturer	Number of Defect Reports in Calendar Year:			
	2014	2015	2016	2017
Cummins	2	4	11	11
Detroit Diesel Corporation	2	1	1	2
Ford		6	6	6
FPT Industrial		12		
Hino Motors				1
Isuzu Motors	1	1	5	1
Navistar	8			
Volvo Powertrain	9	5	4	10
Total	**22**	**29**	**27**	**31**

Table 5-7: Heavy-Duty Highway Engine Defect Reports by Problem Category, Calendar Years 2014 - 2017

Problem category	Number of Defect Reports in Calendar Year:			
	2014	2015	2016	2017
Air Inlet/Intake System		1	1	2
Catalyst/Aftertreatment Component/System (non-diesel engine)	1			1
Computer Related (Other than OBD)	1	2		1
Crankcase Ventilation Component/System		1		2
Diesel Particulate Filter System	3	1	3	3
Electrical, Mechanical and Cooling Systems				1
Emission Control Information Label		2		
Evaporative Emissions Systems	1			
Exhaust Gas Recirculation (EGR) System	1	4		1
Exhaust System		3	3	2
Fuel Delivery Component	3	1	1	
Fuel Delivery System			1	
Fuel Tank Component				1
Ignition Component			3	
Monitoring/Measuring Sensor/System	3	1	2	2
NOx Absorber System		2		
NOx Sensor	1	3	2	
On-Board Diagnostic (OBD) System	2	2	4	9
Selective Catalytic Reduction System	6	3	5	5
Turbocharger/Supercharger		3	2	1
Total	**22**	**29**	**27**	**31**

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5.4 Recall Reporting

The number of recalls and the number of affected engines for each recall for the calendar years 2014 – 2017 are shown in the following two tables, first by manufacturer, and then by problem category. Note that these tables include information about both diesel and spark ignition heavy duty engines.

Table 5-8: Heavy-Duty Engine Recalls by Manufacturer, 2014-2017

Manufacturer	2014		2015		2016		2017	
	#	Affected Engines	#	Affected Engines	#	Affected Engines	#	Affected Engines
Cummins	2	1,851	2	400			1	4,582
Ford			3	327,595	5	731,153	2	37,170
FPT Industrial			1	10,458	1	12,930		
Hino Motors	3	38,275			2	3,243		
Isuzu					1	8,227		
Navistar	7	109,266						
Volvo Powertrain							3	0
Total	**12**	**149,392**	**6**	**338,453**	**9**	**755,553**	**6**	**41,752**

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Table 5-9: Heavy-Duty Engine Recalls by Problem Category, 2014 - 2017

Problem Category	2014		2015		2016		2017	
	#	Affected Engines	#	Affected Engines	#	Affected Engines	#	Affected Engines
Air Inlet/Intake System			1	10,458				
Catalyst/Aftertreatment Component/System (non-diesel engine)	1	176						
Computer Related (Other than OBD)	2	29,432	2	10,234	1	91,042		
Crankcase Ventilation Component/System							1	37,003
Diesel Particulate Filter System	7	111,031						
Electrical, Mechanical and Cooling Systems			1	73				
Exhaust System			1	317,361				
Fuel Delivery System					1	316		
Fuel Tank Component							1	167
Monitoring/Measuring Sensor/System					1	553,595		
On-Board Diagnostic (OBD) System	2	8,753			4	23,761	2	-
Selective Catalytic Reduction System					1	12,930	2	4,582
Turbocharger/ Supercharger			1	327	1	73,909		
Total	**12**	**149,392**	**6**	**338,453**	**9**	**755,553**	**6**	**41,752**

There were no recalls in the problem categories of Emission Control Information Label, Exhaust Gas Recirculation (EGR) System, or NOx Sensor over these calendar years.

6. Nonroad Compression Ignition Engines

EPA regulates several categories of nonroad compression ignition engines, including marine diesel engines, locomotives, and compression ignition engines used in construction and agricultural equipment.

6.1 Marine Diesel Engines

Table 6-1 presents the number of marine diesel certificates issued by manufacturer. Marine diesel engine manufacturers applying for engine certification may request an International Maritime Organization (IMO) certificate in addition to an EPA Certificate of Conformity for the same engine family.[41] The IMO program is different from EPA's program but certain jurisdictions in the U.S. require operators to display an EPA-issued IMO certificate. For the purposes of this compliance report, only one certificate for each engine family was included in the counts listed below. Manufacturers that obtained fewer than 10 certificates over these model years were grouped together as "Other."

[41] The IMO is an agency of the United Nations whose main role is to create a regulatory framework for the shipping industry for safety, security, and environmental performance, including the prevention of marine and atmospheric pollution by ships.

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Table 6-1: Marine Diesel Engine EPA and IMO Certificates by Manufacturer, Model Year 2014 - 2017

Marine Diesel Engine Manufacturer	MY 2014	MY 2015	MY 2016	MY 2017
AB Volvo Penta	11	11	11	13
Beta Marine Ltd	4	6	7	8
Caterpillar Inc.	19	21	19	23
Cummins Inc.	17	15	14	15
Deere & Company	22	26	19	21
Electro-Motive Diesel, Inc.	11	10	11	12
FPT Industrial S.p.A.	4	4	4	7
IHI Agri-Tech Corporation			9	10
IHI Shibaura Machinery Corporation	10	9		
Ingram Barge Company	2	3	3	3
MAN Truck & Bus AG	4	4	6	4
Mercury Marine	4	2	2	2
Mitsubishi Heavy Industries Engine & Turbocharger, Ltd.		1	4	5
MTU America, Inc.	1	4	4	4
NANNI INDUSTRIES SAS	2	3	7	9
National Railway Equipment Co.		3	4	4
Northern Lights Inc	4	4	4	5
Perkins Engines Co Ltd	3	2	3	3
Scania CV AB	10	8	9	11
Transportation Systems Business Operations of General Electric Company	3	2	6	7
Wartsila Oyj	4	4	1	2
Yanmar Co., Ltd.	10	16	16	14
Other (24 manufacturers)	29	32	16	15
Total	**174**	**190**	**179**	**197**

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Figure 6-1 shows the number of marine diesel engines produced for the U.S. in model year 2014-2017.

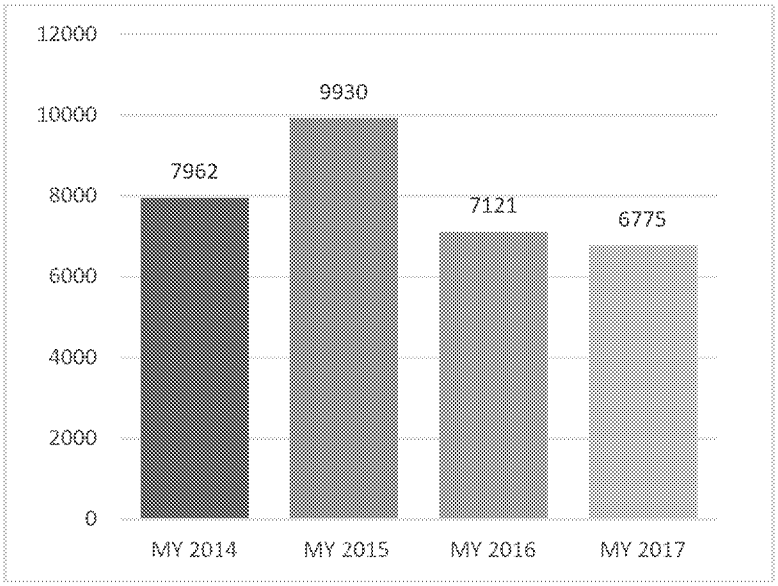

Figure 6-1: Production Volume of Marine Diesel Engines for the U.S, Model Year 2014-2017

6.2 Locomotives

Some engine manufacturers who make engines for locomotives certify those engines to both nonroad compression ignition standards and to locomotive standards. Table 6-2 shows the number of certificates EPA issued for model year 2014 – 2017 locomotive engines:

Table 6-2: Locomotive Certificates by Manufacturer

Locomotive Manufacturer	Number of Engine Families			
	2014	2015	2016	2017
Advanced Global Environmental	11	11	10	
Advanced Global Holdings, Inc.			5	
American Turbocharger Technologies, LLC				3
Burlington Northern Santa Fe Railway			1	2
CIT Rail		1		
Clark Industrial Power LLC				2
CSX Transportation, Inc.	9	9	9	9
Cummins Inc.	4	4	6	6
Electro-Motive Diesel, Inc.	19	19	29	34
HK Engine Components LLC	1	1	1	
Knoxville Locomotive Works				4
MotivePower Inc.	3	4	4	4
MTU America, Inc.	3	4	4	4
National Railway Equipment Co.	6	4	6	8
OceanAir Environmental, LLC	3	3	3	3
Peaker Services, Inc.	2	2	2	
Progress Rail Services	5	7	8	9
Quality Turbocharger Components LLC		1	1	1
RJ Corman Railpower LLC	1			
Thoroughbred Emissions Research, LLC	2	2	3	4
TMV Control Systems Inc.		1	1	1
Tognum America, Inc.	1			
TransPar Corporation	2	2	2	2
Transportation Systems Business Operations of General Electric Company	35	45	55	54
ZTR CONTROL SYSTEMS LLC	1	1	1	1
Total	**108**	**121**	**146**	**151**

EPA provides certificates for non-original equipment manufacturer components, new switch engines, remanufactured switch engines, new line haul engines, and remanufactured line haul engines. Table 6-3 shows the number of each type of certificate issued in model years 2014 – 2017.

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As seen in the table, the majority of certificates for locomotives are for remanufactured engines. Figure 6-2 shows the percentage of each type of certificate in model year 2017.

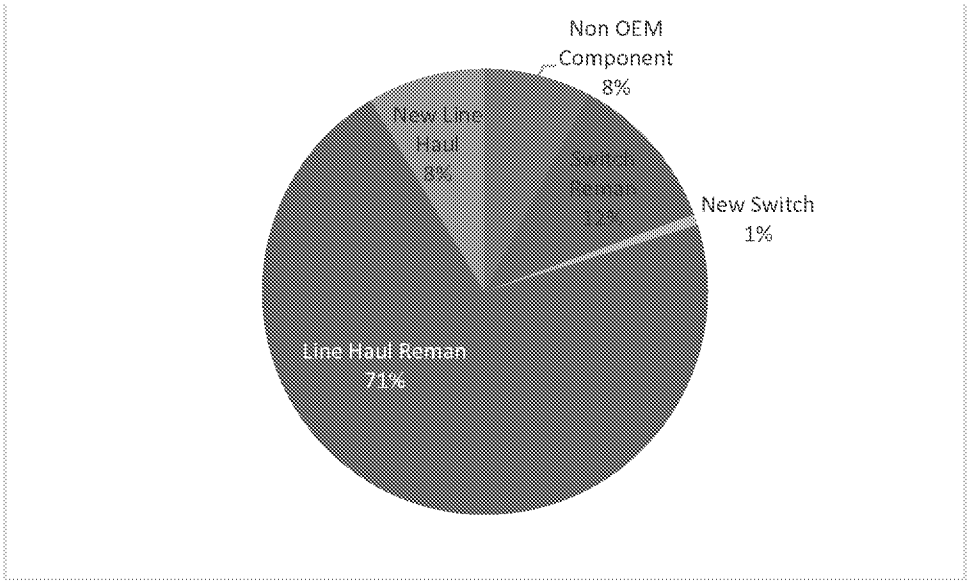

Figure 6-2: Locomotive Certificates by Type, Model Year 2017

The number of locomotive engines produced for the U.S. in model year 2014 – 2017 is shown in Figure 6-2 below.

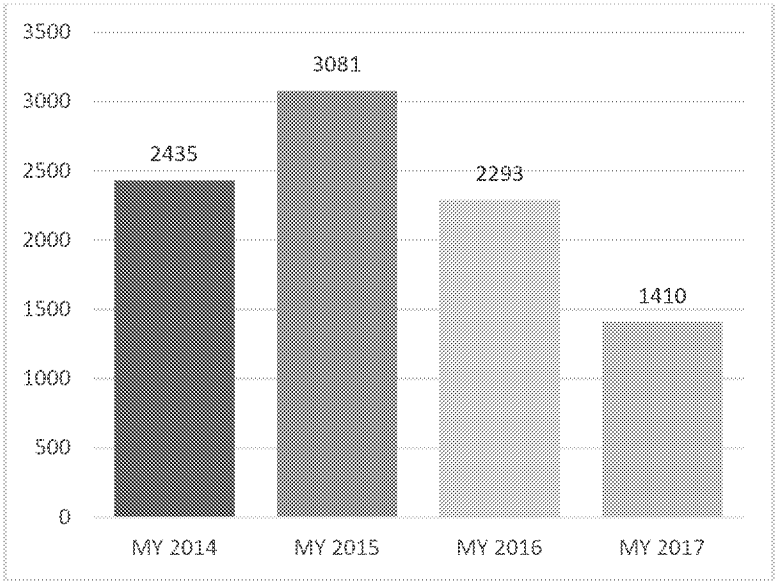

Figure 6-3: Production Volume of Locomotive Engines for the U.S., Model Year 2014-2017

6.3 Diesel Powered Equipment, Including Construction and Agricultural Engines

Nonroad compression ignition engines are used in tractors, generators, construction equipment, agricultural equipment, forklifts, and welders. These engines can be certified for use in one or more service classes. Table 6-3 presents the number of certificates that were issued for model year 2014 – 2017 covering each power category.

Table 6-3: Diesel Powered Equipment (Construction and Agricultural) Engine Families by Service Class, Model Years 2014 - 2017

Service Class (Power Category)	Number of Engine Families			
	MY 2014	MY 2015	MY 2016	MY 2017
1 = kW<8	11	16	18	18
2 = 8<=kW<19	69	66	69	72
3 = 19<=kW<37	63	69	74	66
4 = 37<=kW<56	66	79	87	90
5 = 56<=kW<75	17	15	13	13
6 = 56<=kW<130		6	18	27
7 = 75<=kW<130	57	42	35	35
8 = 130<=kW<225	11	12	10	10
9 = 130<=kW<=560	60	79	84	84
10 = 225<=kW<450	19	17	18	18
11 = 225<=kW<=560				
12 = 450<=kW<=560	8	8	8	7
13 = 560<kW<=900	14	11	15	13
14 = 560<kW<=2237	29	25	24	23
15 = kW>560		4	5	6
16 = kW>900	7	7	9	9
17 = kW>2237	1			
Total	**432**	**456**	**487**	**491**

Table 6-4 shows the number of engine families certified by each manufacturer for the same model years. There are 41 manufacturers listed in this table, certifying one or more engine families for at least one of these model years.

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Table 6-4: Construction and Agricultural Engine Families by Manufacturer, Model Years 2014 - 2017

Construction and Agricultural Engine Manufacturers	Number of Engine Families			
	MY 2014	MY 2015	MY 2016	MY 2017
AGCO POWER INC. (SID)	6	7	7	6
CATERPILLAR (CPX)	26	24	26	25
CMI (CEX)	39	41	41	39
DAEDONG (DCL)	4	6	8	7
DEERE (JDX)	26	25	30	27
DETROIT DIESEL (DDX)	2	2	2	2
DEUTZ (DZX)	25	28	28	29
DOOSAN (DIC)	5	6	7	8
FCA ITALY (FTG)		1	2	2
FPT INDUSTRIAL S.P. (FPX)	27	30	29	31
GLOBAL COMPONENT TC (NFX)	1	1	2	2
HML (HMX)	2	2	2	2
IAT (H3X)	45	43	44	36
ISEKI (ICL)	2	2	2	2
ISUZU (SZX)	10	17	16	19
JCB POWER SYSTEMS (JCB)	3	3	3	3
KOHLER CO. (KHX)	7	10	11	10
KOMATSU LTD. (KLX)	10	7	10	11
KOOP (CKP)			1	1
KUBOTA (KBX)	36	39	44	46
KUKJE MACHINERY (KMC)	9	10	9	11
LMB (LHA)	8	6	8	8
LS MTRON (LGC)		4	3	4
M&M (MML)	16	15	16	29
MAN (MNB)			2	2
MERCEDES-BENZ (MBX)	5	6	6	6
MITSUBISHI (MVX)	17	15	19	20
MOTORENFABRIK HATZ (HZX)	9	13	12	9
MTU DD (MDD)	8	8	8	7
NAV (NVX)	1			
PERKINS (PKX)	18	21	18	16
PSA PEUGEOT CITROEN (PEX)	1	1	1	
SCANIA (Y9X)	4	4	4	4
SIMPSON & CO LIMITED (SCL)	1	1	1	1
TIEM (TIE)	2	2	2	2
VM MOTORI (V5X)	1			
VOLKSWAGEN (VWX)	1	1	1	1
VOLVO CE (VSX)	3	3	3	3

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Construction and Agricultural Engine Manufacturers	Number of Engine Families			
	MY 2014	MY 2015	MY 2016	MY 2017
VPX (VPX)	14	13	13	13
YANMAR (YDX)	38	39	46	46
ZETOR NORTH AMERICA (6AX)				1
Total	**432**	**456**	**487**	**491**

The number of construction and agricultural engines produced in the U.S. in model year 2014 – 2017 is shown in Figure 6-3 below. Note the magnitude of these production numbers is in the hundreds of thousands.

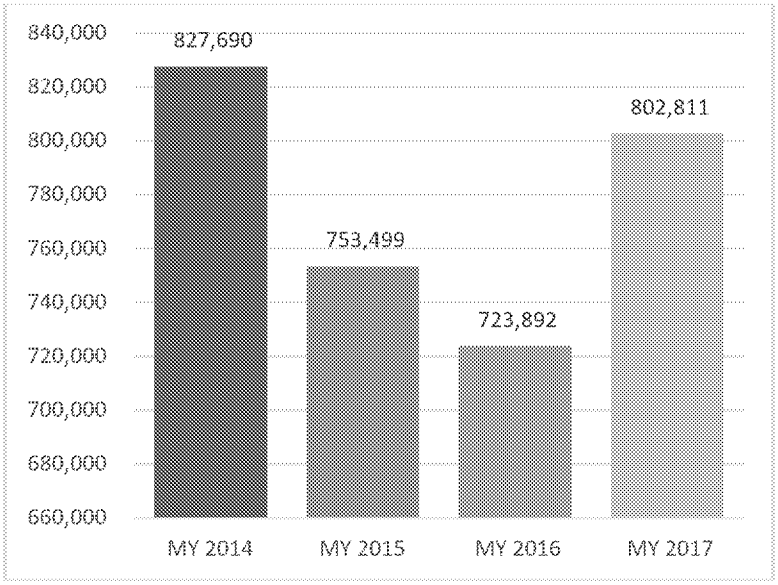

Figure 6-4: Construction and Agricultural Engine Production Volume for the U.S., Model Years 2014-2017

7. Nonroad Spark Ignition Engines

Nonroad spark ignition (Nonroad SI) engines are divided into three categories for purposes of exhaust emissions compliance:

1. Small spark ignition (Small SI) engines are generally rated below 25 horsepower (19 kW) and are used in household and commercial applications, including lawn and garden equipment, generators, and a variety of other construction, farm, and industrial equipment.
2. Marine spark ignition (Marine SI) engines are used in marine vessels, including outboard engines, personal watercraft, and sterndrive/inboard engines.
3. Large spark ignition (Large SI) engines are generally rated above 19 kW and used in forklifts, compressors, generators, and stationary equipment.

Equipment that runs with an NRSI engine is also subject to evaporative emissions standards.

7.1 Small Spark Ignition Engines

There are five classes of Small SI engines. Classes are defined by whether or not the engine is used in a handheld piece of equipment, and by engine displacement. Classes I and II describe engines not used in handheld equipment, and Classes III, IV, and V engines are used in handheld equipment, such as chainsaws, string trimmers, and leaf blowers.

EPA OTAQ certifies the greatest number of certificates for Small Spark Ignition engine families. This sector has more manufacturers than any other sector.

Table 7-1 presents the number of Small SI engine families that EPA certified in model year 2014-2017, by engine class. This sector has the largest number of engine families, as 900 or more were certified in each of these model years.

Table 7-1: Small Spark Ignition Engine Families by Class, Model Years 2014 - 2017

Small SI Engine Class	Number of Engine Families			
	MY 2014	MY 2015	MY 2016	MY 2017
Class I (non-handheld)	192	214	208	210
Class II (non-handheld)	303	328	322	336
Class III (handheld)	1	1	0	0
Class IV (handheld)	253	256	254	255
Class V (handheld)	151	157	160	171
Total	**900**	**956**	**944**	**972**

Table 7-2 shows the number of Small SI Engine families certified in model years 2014 – 2017 by manufacturer. In addition to having the greatest number of engine families, this sector also has the largest number of manufacturers. A total of 146 manufacturers obtained certificates from EPA during model years 2014 – 2017 for at least one engine family in at least one of these model years.

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Table 7-2: Small Spark Ignition Engine Families by Manufacturer, Model Years 2014 -2017

Small SI Engine Manufacturer	Number of Engine Families			
	MY 2014	MY 2015	MY 2016	MY 2017
American Honda Motor Co., Inc.	26	25	25	26
ANDREAS STIHL AG & Co. KG	56	55	57	54
Briggs & Stratton Corporation	39	45	45	46
Chongqing Dajiang Power Equipment CO.,LTD	16	17	20	24
Chongqing Maifeng Power Machinery Co., Ltd	6	11	11	10
Chongqing Rato Technology Co., Ltd	25	23	24	25
Chongqing Shineray Agricultural Machinery Co.,Ltd	7	10	11	12
Chongqing Zongshen General Power Machine Co., Ltd	24	25	31	31
ECHO Incorporated/Yamabiko Corporation	51	53	54	56
EMAK S.p.a.	16	17	12	18
Fuji Heavy Industries	22	22	21	16
Generac Power Systems, Inc.	17	13	11	13
Hitachi Koki USA Ltd.	15	14	12	11
Husqvarna AB	31	29	26	29
Husqvarna Outdoor Products N.A., Inc.	19	18	26	18
Husqvarna Zenoah Co., Ltd.	22	24	18	16
Jiangsu Jiangdong Group Co. Ltd.	27	32	29	31
Kawasaki Motors Corp., U.S.A.	32	36	34	35
Kohler Co.	29	36	35	41
Lifan Industry (Group) Co., Ltd.	23	22	18	18
Liquid Combustion Technology, LLC	8	9	13	13
Loncin Motor Co., Ltd.	22	27	26	32
Makita Engineering Germany GmbH	12	12	12	13
MTD Consumer Group, Inc.	14	13	11	13
Shandong Huasheng Zhongtian Machinery Group CO.,LTD.	18	19	21	20
SHANDONG YONGJIA POWER CO.,LTD	0	1	12	14
Techtronic Industries North American, Inc.	11	13	15	12
Wenling Jennfeng Industry Inc.	12	17	13	14
Wuxi Kipor Power Co., Ltd.	9	9	9	12
Yamaha Motor Corporation	14	14	13	14
Yongkang Xingguang Electrical Manufacture Co.,Ltd	13	13	13	12
Zhejiang Xingyue Industry Co.,Ltd	14	15	16	15
Zhejiang Yaofeng Power Technology Co., Ltd.	8	13	12	16
Other (> 100 manufacturers)	242	254	238	242
Total	**900**	**956**	**944**	**972**

Table 7-3 and Figure 7-1 show model year 2017 Small SI engine production volumes for the U.S. by engine class. As seen in Figure 7-1, about half of the Small SI engines produced for the U.S. are handheld categories, and about half are non-handheld categories.

Table 7-3: Small SI Engine Production Volumes, Model Year 2017

Small SI Engine Class	Production Volume	Percent of total
Non-handheld Class I	9,880,141	36%
Non-handheld Class II	4,140,248	15%
Handheld Class IV	10,881,386	40%
Handheld Class V	2,311,646	8%
Total Small SI	**27,213,421**	**100%**

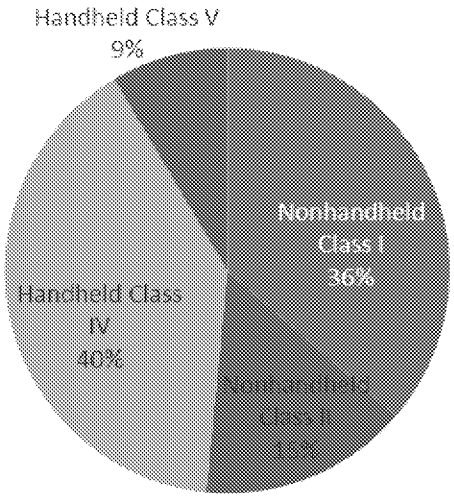

Figure 7-1: Small SI Engine Production Percentages by Engine Class, Model Year 2017

7.2 Marine Spark Ignition Engines

Marine Spark Ignition (marine SI) engines are used in boats with outboard motors, personal watercraft, and boats with sterndrive or inboard motors. Table 7-4 shows the marine SI engine families by manufacturer, for model year 2014 – 2017.

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Table 7-4: Marine Spark Ignition Engine Families by Manufacturer, Model Year 2014- 2017

Marine Spark Ignition Engine Manufacturer	Number of Engine Families			
	MY 2014	MY 2015	MY 2016	MY 2017
American Honda Motor Co., Inc.	11	11	11	13
Bombardier Recreational Products, Inc	16	20	23	25
Briggs & Stratton Corporation	2	4	4	1
Hangzhou Hidea Power Machinery Co., Ltd.	6	6	0	6
Hangzhou Seanovo Power Machinery Co., Ltd.	0	6	0	0
Ilmor Engineering, Inc.	4	4	4	5
INDMAR PRODUCTS CO., INC	5	7	7	8
Kawasaki Motors Corp., U.S.A.	2	2	2	2
KEM Equipment, Inc.	4	6	7	7
LEHR LLC	4	5	5	4
MARINE POWER HOLDING LLC	1	2	2	4
Mercury Marine	35	37	31	27
OUTBOARDS GROUP C.V.	2	2	2	3
Pleasurecraft Marine Engine Company	4	5	5	5
Suzhou Parsun Power Machine Co., Ltd.	7	7	7	8
Suzuki Motor Corporation	11	11	10	10
Textron Specialized Vehicles	0	0	2	2
TOHATSU CORPORATION	9	10	9	10
Volvo Penta of the Americas, LLC	8	9	8	7
Yamaha Motor Corporation	28	28	29	25
Zhe Jiang Hui Yuan Power Technology Co.Ltd.	0	0	0	3
Other	10	7	4	6
Total:	**169**	**189**	**172**	**178**

Table 7-5 shows the number of each of these types of marine SI engines produced for the U.S. for model year 2017, and as Figure 7-2 illustrates, three quarters of the marine SI engines produced were outboard motors.

Table 7-5: Marine SI Engine Production Volume, Model Year 2017

Marine SI Engine Category	Production Volume	Percent of total
Outboard	287,907	75%
Personal Watercraft	66,775	17%
Sterndrive/Inboard	31,397	8%
Total Marine SI	**386,079**	**100%**

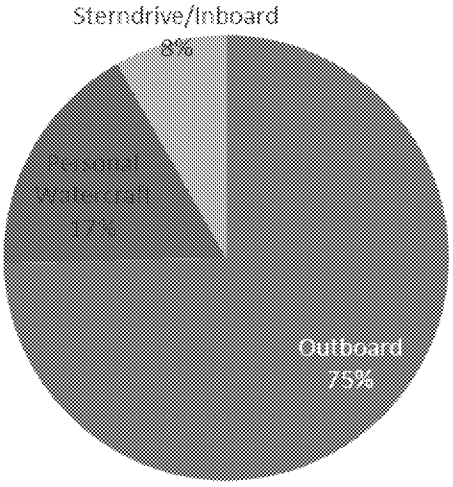

Figure 7-2: Marine SI Engine Production Percentages by Category, Model Year 2017

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7.3 Large Spark Ignition Engines

Large spark ignition engines include nonroad engines powered by gasoline, propane, or compressed natural gas rated over 19 kilowatts (25 horsepower). These engines are used in commercial and industrial applications, including forklifts, electric generators, airport baggage transport vehicles, and a variety of farm and construction applications.

Table 7-6 below shows model year 2014- 2017 large spark ignition engine families by manufacturer.

Table 7-6: Large Spark Ignition Engine Families by Manufacturer, Model Year 2014-2017

Large Spark Ignition Engine Manufacturer	Number of Engine Families			
	2014	2015	2016	2017
Generac Power Systems, Inc.	55	54	59	64
Bucks Engines	9	9	0	0
Caterpillar Inc.	1	1	3	3
Chongqing Panda Machinery Co., Ltd.	2	3	2	2
Crown Equipment Corporation	1	1	1	2
Cummins Inc.	12	12	14	17
Deutz AG	2	5	5	5
Dresser, Inc.	1	1	1	3
ENER-G Rudox Inc.	2	3	3	2
Engine Distributors, Inc.	5	6	6	11
Global Component Technologies Corporation	3	3	3	3
Graham Ford Power Products	2	4	3	1
Guascor Power S.A.U.	5	8	8	8
IMPCO Technologies, Inc.	9	9	4	0
KEM Equipment, Inc.	15	15	15	15
Kohler Co.	4	4	6	6
Kubota Corporation	5	7	7	6
Mitsubishi Heavy Industries, Ltd.	2	2	2	2
MTU America, Inc.	3	5	5	7
Origin Engines	2	3	3	4
Power Solutions International, Inc.	21	20	23	24
Springfield Remanufacturing Corp.	5	4	4	4
Toyota Industrial Equipment Manufacturing, Inc.	2	2	2	2
Weichai America Corporation	0	2	0	3
Westport Power Inc.	1	1	2	3
Wisconsin Motors, LLC.	4	4	2	1
Woodward, Inc.	3	3	2	1
Zenith Power Products	9	10	13	11
Other (16 manufacturers)	9	7	12	18
Total:	**194**	**208**	**210**	**226**

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Total production volume of model year 2017 large spark ignition engines for the U.S. was 242,121.

7.4 Evaporative Components

In addition to spark ignition engines themselves, EPA certifies evaporative components used with these engines, such as hoses and fuel tanks. Table 7-7 shows the variety of evaporative component types that EPA certifies, and the number of evaporative component families that received certificates for model years 2014 – 2017.

Table 7-7: Nonroad Spark Ignition Evaporative Component Families by Type, Model Years 2014- 2017

Component Type	Number of Evaporative Component Families			
	MY 2014	MY 2015	MY 2016	MY 2017
Fuel Cap Permeation	14	15	16	18
Fuel Line Permeation	128	138	134	141
Fuel Tank Permeation	235	242	244	237
Large SI Diurnal	1	1	0	0
Marine SI Diurnal	30	33	32	29
Handheld Equipment Certification	68	67	74	76
Nonhandheld Equipment Certification	337	333	341	362
Vessel Certification	2	2	2	3
Total	**815**	**831**	**843**	**866**

7.5 Defect Reporting

Defect reports are for the entire category of nonroad spark ignition engines, rather than the subcategories of small, marine, and large SI engines. Table 7-8 presents defect reports by manufacturer, and Table 7-9 presents them by problem category.

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Table 7-8: Nonroad Spark Ignition Engine Defect Reports by Manufacturer, Calendar Year 2014 - 2017

Manufacturer	Number of Defect Reports in Calendar Year:			
	2014	2015	2016	2017
Bombardier Recreational Products	2	1	0	0
Briggs & Stratton	1	0	0	0
Cummins Power	0	0	0	1
Honda	4	0	1	0
Husqvarna AB	1	0	0	0
IMPCO Technologies	0	0	0	1
Indmar Products	0	0	0	2
Kubota Corp	0	1	0	0
Mercury/Sea Ray	1	0	0	0
Polaris	0	0	1	0
Stihl	0	0	1	0
Yamaha	0	0	1	0
Total:	**9**	**2**	**4**	**4**

Table 7-9: Nonroad Spark Ignition Engine Defect Reports by Problem Category, Calendary Year 2014 - 2017

Problem Category	Number of Defect Reports in Calendar Year:			
	2014	2015	2016	2017
Catalyst/Aftertreatment Component/System	0	0	0	1
Computer Related (other than OBD)	1	0	0	0
Electrical, Mechanical & Cooling Systems	2	1	0	0
Engine Emission Control Information Label	3	0	0	0
Fuel Delivery Component	2	1	3	1
Ignition Component	1	0	0	0
Monitoring/Measuring Sensor/System	0	0	1	1
On-Board Diagnostic (OBD) System	0	0	0	1
Total:	**9**	**2**	**4**	**4**

7.6 Recall Reporting

As in the case with defect reports, the recall reports are provided for the nonroad spark ignition engine category as a whole for calendar years 2014 - 2017. There were no recalls for this sector in 2015. Table 7-10 presents recall reports by manufacturer, and Table 7-11 presents them by problem category.

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Table 7-10: Nonroad Spark Ignition Engine Recalls by Manufacturer, 2014 - 2017

Manufacturer	2014		2016		2017	
	#	Affected Engines	#	Affected Engines	#	Affected Engines
Briggs & Stratton	1	900	0	--	0	--
Honda	1	20,602	0	--	2	3,079
Indmar Products	0	--	0	--	1	1,092
Kohler	0	--	1	968	0	--
Stihl	0	--	1	5,294	0	--
Yamaha	0	--	1	3,100	0	--
Total:	**2**	**21,502**	**3**	**9,362**	**3**	**4,171**

Table 7-11: Nonroad Spark Ignition Engine Recalls by Problem Category, 2014 - 2017

Problem Category	2014		2016		2017	
	#	Affected Engines	#	Affected Engines	#	Affected Engines
Electrical, Mechanical & Cooling Systems	1	900	0	--	0	--
Fuel Delivery Component	0	--	2	8,394	2	3,079
Fuel Delivery System	0	--	1	968	0	--
Monitoring/Measuring Sensor/System	1	20,602	0	--	0	--
On-Board Diagnostic (OBD) System	0	--	0	--	1	1,092
Total:	**2**	**21,502**	**3**	**9,362**	**3**	**4,171**

8. Recreational Vehicles

Recreation vehicles include all-terrain vehicles (ATVs), utility vehicles (UTVs), sand cars, dune buggies, go karts, off-highway motorcycles, and snowmobiles. Emissions from these vehicles were not regulated until model year 2006. Each of the recreational vehicle categories is subject to an individual set of exhaust emissions standards, and all recreational vehicles became subject to the same fuel component-based permeation emission standards beginning in model year 2008.

8.1 Certification

8.1.1 All-Terrain Vehicles and Utility Vehicles

There were 85 different manufacturers that certified ATV and UTV products for model years 2014 – 2017. Table 8-1 lists the manufacturers that certified engine families over this four-year period (those certifying fewer than 10 are grouped together as "Other").

Table 8-1: ATV and UTV Engine Families by Manufacturer, Model Years 2014-2017

Manufacturer	Number of ATV and UTV Engine Families			
	MY 2014	MY 2015	MY 2016	MY 2017
American Honda Motor Co., Inc.	11	8	11	11
Arctic Cat	15	14	13	15
Bennche, LLC.			5	6
BMS Motorsports, Inc.	3	1	2	4
Bombardier Recreational Products, Inc	13	12	15	16
BV Powersports, LLC	4	2	2	3
CF Moto Powersports, Inc.	9	5	7	8
Deere & Company	6	4	5	5
Global Resource Development, LLC	3	3	3	2
Hisun Motors Corp., U.S.A.	8	15	18	21
Kawasaki Motors Corp., U.S.A.	5	4	4	4
KYMCO USA	12	13	12	10
LIL PICK UP INC.	4	5	3	6
Linhai Powersports USA Corporation		2	5	7
Massimo Motor Sports LLC		7	7	
Maxtrade	2	3	3	4
Polaris Industries Inc.	17	10	14	15
Ricky Power Sports, LLC		4	4	4
Suzuki Motor Corporation	6	4	4	5
Taotao USA Inc.	7	8	8	6
U-Storm Power Corporation	4	3	3	3
XY POWERSPORTS LLC	6	6		
Yamaha Motor Corporation	11	5	8	9
Other (> 60 manufacturers)	51	67	50	68
Total	**197**	**205**	**206**	**232**

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8.1.2 Off-highway Motorcycles

There were 25 manufacturers that certified off-highway motorcycle engines for model years 2014 – 2017. Table 8-2 lists the manufacturers that certified at least five different products over this four-year period; the rest are grouped together in the category of "Other."

Table 8-2: Certificates for Off-Highway Motorcycles, Model Years 2014-2017

Off-Highway Motorcycle Manufacturer	Number of Off-Highway MC Families			
	MY 2014	MY 2015	MY 2016	MY 2017
American Honda Motor Co., Inc.	6	8	8	8
Apollo Motorsports USA, Inc.	3	3	3	3
APT Powersport and Utility Products, LLC	2	2	1	2
Baja Inc.	2	2	1	
Hisun Motors Corp., U.S.A.	1	1	1	2
Kawasaki Motors Corp., U.S.A.	3	2	2	3
KTM North America, Inc.	4	3	3	
Lianmei LLC	2	2	2	2
Maxtrade	2	2	2	2
Monster Moto, LLC	1	2	1	3
Ricky Power Sports, LLC	2	5	4	3
Suzuki Motor Corporation	1	2	2	3
Taotao USA Inc.	3	3	2	1
XMotos USA, Inc.	4	4	4	3
Yamaha Motor Corporation	6	7	7	7
Other (10 manufacturers)	7	5	4	7
Total	**49**	**53**	**47**	**49**

Recreational vehicles were not regulated until model year 2006.

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8.1.3 Snowmobiles

Eight manufacturers certified snowmobile engines for model years 2014 – 2017, as shown in Table 8-3.

Table 8-3: Snowmobile Engine Families by Manufacturer, Model Years 2014 - 2017

Snowmobile Manufacturer	Number of Snowmobile Families			
	MY 2014	MY 2015	MY 2016	MY 2017
Arctic Cat	8	7	8	9
Bombardier Recreational Products, Inc	9	8	8	8
HJR		1		
IRBIS USA LLC				1
KING DISTRIBUTION LLC	1			
Polaris Industries Inc.	7	6	6	6
Taotao USA Inc.			1	
Yamaha Motor Corporation	7	7	6	9
Total	**32**	**29**	**29**	**33**

8.1.4 Two-Stroke Engines

As shown in Table 8-4, in model years 2014 – 2017, no ATV/UTV manufacturers produced two-stroke engines, and only a small percentage of the off-highway motorcycle families certified were two-stroke engines. As for snowmobiles, less than half of the families were two-stroke engines. These data illustrate the continued technology shift to four-stroke engines, which typically have lower emissions. When the current recreation vehicle regulations were written, most ATVs sold in the U.S. and almost all snowmobiles used two-stroke engines.

Table 8-4: Percentage of Two-Stroke Engine Recreational Vehicle Families, Model Years 2014 - 2017

Recreational Vehicle Type	Percentage of Two Stroke Engine Families			
	2014	2015	2016	2017
ATV/UTV	0.0%	0.0%	0.0%	0.0%
Off-Highway Motorcycles	2.0%	1.9%	2.1%	2.0%
Snowmobiles	47%	43%	43%	45%

8.2 Production Volume

Total production of recreation vehicles for the U.S. is found in Table 8-5. There were 919,317 recreational vehicles produced for the U.S. in MY 2017. As seen in both Table 8-5 and Figure 8-1, the ATV/UTV category makes up the largest share of these vehicles.

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Table 8-5: Production Volume of Recreational Vehicles, Model Year 2017

Recreational Vehicle Type	Production Volume	Percent
All-Terrain Vehicle/Utility Vehicle	745,923	81%
Off-Road Motorcycle	120,006	13%
Snowmobile	53,388	6%
Total:	919,317	100%

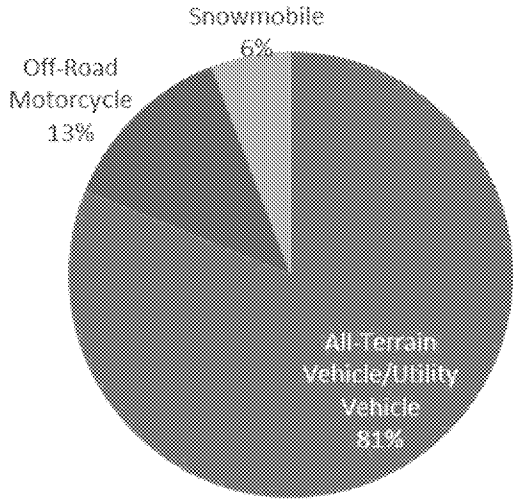

Figure 8-1: Recreational Vehicle Types, Model Year 2017

8.3 Defect Reporting

Defect reports for the entire category of recreational vehicles for calendar years 2014 – 2017 are provided by manufacture and by problem category, in Table 8-6 and Table 8-7, respectively.

Table 8-6: Recreational Vehicle Defect Reports by Manufacturer, Calendar Years 2014 - 2017

Manufacturer	Number of Defect Reports			
	2014	2015	2016	2017
Arctic Cat		0	0	1
Bombardier Recreational Products	0	1	1	3
Honda	0	1	1	1
Kawasaki	0	0	0	4
Kawasaki Motors	1	0	0	0
Polaris	0	0	1	0
Yamaha	0	0	1	0
Total:	**1**	**2**	**4**	**9**

Table 8-7: Recreational Vehicle Defect Reports by Problem Category, Calendar Years 2014 - 2017

Problem Category	Number of Defect Reports			
	2014	2015	2016	2017
Computer Related (other than OBD)	0	0	1	0
Crankcase Ventilation Component/System	0	0	1	0
Electrical, Mechanical & Cooling Systems	0	1	0	0
Engine Emission Control Information Label	0	0	0	1
Exhaust System	0	0	0	1
Fuel Delivery Component	1	1	1	5
Monitoring/Measuring Sensor/System	0	0	1	2
Total:	**1**	**2**	**4**	**9**

8.4 Recall Reporting

Recalls for recreational vehicles are shown by manufacturer and by problem category in the following tables, Table 8-8 and Table 8-9, respectively.

Table 8-8: Recreational Vehicle Recalls by Manufacturer, Calendar Year 2014 - 2017

Manufacturer	2014		2015		2016		2017	
	Number of		Number of		Number of		Number of	
	Recalls	Affected Engines	Recalls	Affected Engines	Recalls	Affected Engines	Recalls	Affected Engines
Arctic Cat	0		0		0		1	1,079
Bombardier Recreational Products	0		1	244				
Kawasaki	2	20,016	0		0		4	89,472
Yamaha	0		0		1	800	0	
Total:	**2**	**20,016**	**1**	**244**	**1**	**800**	**5**	**90,551**

Table 8-9: Recreational Vehicle Recalls by Problem Type, Calendar Years 2014 - 2017

Problem Category	2014		2015		2016		2017	
	Number of		Number of		Number of		Number of	
	Recalls	Affected Engines	Recalls	Affected Engines	Recalls	Affected Engines	Recalls	Affected Engines
Crankcase Ventilation Component/System	0		0		1	800	0	
Exhaust System	0		0		0		1	22,456
Fuel Delivery Component	2	20,016	1	244	0		4	68,095
Total:	**2**	**20,016**	**1**	**244**	**1**	**800**	**5**	**90,551**

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9. Alternative Fuels and Alternative Fuel Conversions

Some vehicles and engines are designed to operate on fuels other than gasoline and diesel by their manufacturers (referred to as the original equipment manufacturer, or OEM), while others are certified to operate on gasoline or diesel fuel and are later converted to operate on an alternative fuel by an aftermarket manufacturer. Generally, the Clean Air Act prohibits any aftermarket changes to a certified vehicle or engine configuration that could affect emissions, but clean alternative fuel conversions may be exempted from this prohibition under certain conditions. Each vehicle/engine sector has different criteria under which vehicles and engines can be converted to operate on a new fuel. In some sectors, fuel conversions are certified using OEM certification provisions.

9.1 Alternative Fuels: Light-Duty Vehicles

9.1.1 Test Groups

Table 9-1 presents the number of light-duty vehicle exhaust test groups by fuel type and manufacturer (OEM). (Blanks in this table are zero.) This table includes vehicles manufactured to operate on gasoline and diesel, as well as on alternative fuels. The number of light-duty certificates presented in Table 3-1 is greater than the number of exhaust light-duty test groups in Table 9-1, since light-duty certificates are issued for each unique combination of exhaust test group and evaporative family. Plug-in hybrid electric vehicles (PHEV) are those that can run on either gasoline or electricity.

Table 9-1: Light-Duty OEM Fuel Test Groups by Manufacturer, Model Years 2014 -2017

Fuel Type	Manufacturer	Number of Exhaust Test Groups			
		MY 2014	MY 2015	MY 2016	MY 2017
Battery Electric	American Honda Motor Co., Inc.	1			1
	BMW	1	1	1	1
	Bollore Group			1	
	BYD Motors Inc.	1	1	1	1
	Chrysler Group LLC	1	1		
	FCA US LLC			1	1
	Ford Motor Company	1	1	1	1
	General Motors LLC	1	1	1	1
	Hyundai Motor Company				1
	Kia Motors Corporation		1	1	1
	Mercedes Benz	2	2	2	3
	Mitsubishi Motors Corporation	1	1	1	1
	Nissan Motor Co., Ltd.	1	1	2	1
	Rimac Automobili				1
	Tesla Motors Inc	2	2	3	1
	Tesla, Inc.				3
	Toyota Motor Corporation	1			
	Volkswagen Group of America, Inc.		1	1	1
	Zenith Motors LLC	1			

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Fuel Type	Manufacturer	Number of Exhaust Test Groups			
		MY 2014	MY 2015	MY 2016	MY 2017
CNG	American Honda Motor Co., Inc.	1	1		
	Mobility Ventures LLC	1			
CNG/Gasoline	Fiat Chrysler (FCA) US LLC	1	1	1	1
	Quantum Fuel Systems Technologies Worldwide, Inc.		1	1	
Diesel	BMW	3	4	4	3
	Cummins Inc.	2	2	3	3
	Fiat Chrysler (FCA) US LLC	2	2	2	1
	Ford Motor Company	2	4	4	4
	General Motors LLC	3	3	3	6
	Isuzu Motors Limited	1	1	1	1
	Jaguar Land Rover Limited			1	2
	Mercedes Benz	6	11	11	4
	Porsche AG	1	1	1	
	Volkswagen Group of America, Inc.	5	4	2	
E85-Gasoline	Fiat Chrysler (FCA) US LLC	5	4	4	4
	Ford Motor Company	12	9	11	14
	General Motors LLC	10	8	8	7
	Jaguar Land Rover Limited	4	3		
	Mercedes Benz	2	2	2	2
	Nissan Motor Co., Ltd.	1	1		1
	Toyota Motor Corporation	1	1	1	1
	Volkswagen Group of America, Inc.	2	2	1	1
Gasoline	American Honda Motor Co., Inc.	24	21	19	28
	Aston Martin Lagonda	2	3	3	2
	Auto Boutique, Ltd.	1			
	Automobili Lamborghini S.p.A.	1			
	BMW	19	22	22	22
	Compliance & Research Services	1			
	DRPC, LLC		1		1
	Falcon Lab LLC	1	1	1	
	Fiat Chrysler (FCA) US LLC	25	24	27	28
	Ferrari North America, Inc.	3	4	2	3
	Ford Motor Company	34	45	49	46
	Fuji Heavy Industries	8	9	9	8
	G&K Automotive Conversion, Inc.	2	1	3	1
	General Motors LLC	24	24	36	35
	Hyundai Motor Company	18	19	18	21
	J.K. Technologies, LLC	2	3	2	4
	Jaguar Land Rover Limited	8	10	6	6

Fuel Type	Manufacturer	Number of Exhaust Test Groups			
		MY 2014	MY 2015	MY 2016	MY 2017
	Karma Automotive LLC				1
	Kia Motors Corporation	16	19	18	21
	Koenigsegg Automotive AB		1		
	Lotus Cars Ltd	1	1		1
	Maserati North America, Inc.	3	3	4	4
	Mazda Motor Corporation	11	11	8	10
	McLaren Automotive Limited	2	2	1	1
	Mercedes Benz	16	20	19	19
	Mitsubishi Motors Corporation	8	10	9	9
	Mobility Ventures LLC	1	1	1	
	Nissan Motor Co., Ltd.	30	30	34	36
	Northern California Diagnostic	1			
	Pagani Automobili S.p.A.	1		1	1
	Porsche AG	12	11	10	11
	Redmer Strategic Products and Services Inc.		1		1
	Rolls-Royce Motor Cars Limited	2	2	2	2
	Roush Industries, Inc.	3	1	2	2
	RUF Automobile GmbH	1	1		
	Subaru Corporation				
	Suzuki Motor Corporation	2			
	Toyota Motor Corporation	39	36	37	33
	US Drive Right	1			
	US Specs LLC	1	1	1	1
	Volkswagen Group of America, Inc.	27	27	24	27
	Volvo Car USA, LLC				5
	Volvo Cars of North America LLC	4	6	6	
	Volvo Cars USA, LLC				
	Wallace Environmental Testing Laboratories, Inc.	1	1	1	1
Hydrogen Fuel Cell	American Honda Motor Co., Inc.	1			1
	Hyundai Motor Company		1	1	1
	Toyota Motor Corporation			1	1
Gasoline/Electric (PHEV)	American Honda Motor Co., Inc.				
	BMW			1	1
	Ford Motor Company			1	1
	Mitsubishi Motors Corporation				
Total		**436**	**451**	**456**	**470**

Table 9-2 summarizes the information in Table 9-1, by providing the total number of light-duty test groups by fuel type only.

Table 9-2: Light-Duty Vehicle Test Groups by Fuel Type, Model Years 2014 - 2017

Fuel Type	MY 2014	MY 2015	MY 2016	MY 2017
Battery electric	14	13	16	19
CNG	2	1	0	0
CNG/Gasoline	1	2	2	1
Diesel	25	32	32	24
E85-Gasoline	37	30	27	30
Gasoline	356	372	375	391
Hydrogen Fuel Cell	1	1	2	3
Gasoline/Electric (PHEV)			2	2
Total	**436**	**451**	**456**	**470**

9.1.2 Production Volume by Fuel Type

In Table 9-3, the numbers of light-duty vehicles produced for the U.S. is provided by fuel type in model years 2014 - 2017. Gasoline vehicles comprise the dominant fuel type, followed by gasoline/ethanol, or "flexible fuel" vehicles. Traditionally, diesel has been the next most prevalent fuel type, and in model years 2014 and 2015, there were more light-duty diesel vehicles produced in the U.S. than electric vehicles. However, in this four-year period, diesel vehicle production volume decreased more than 75 percent. And, production volume of plug-in hybrid vehicles (PHEV), which can run on either gasoline or electricity, as well as production volume of electric vehicles, more than doubled.

Table 9-3: Light-Duty Production Volume for the U.S. by Fuel Type, Model Years 2014-2017

Fuel Type	MY 2014	MY 2015	MY 2016	MY 2017
Gasoline	12,432,878	14,630,083	14,738,887	16,406,804
Gasoline/Ethanol	2,800,268	1,838,386	1,338,869	1,166,084
Gasoline/Electric (PHEV)	61,428	44,577	52,001	128,977
Electric	44,399	79,263	79,984	101,981
Diesel	188,308	158,844	75,088	44,492
Hydrogen Fuel Cell	1	72	845	3,521
Gasoline/CNG	0	225	87	0
CNG	901	300	0	0
LPG	181	0	0	0
Total	**15,528,364**	**16,751,750**	**16,285,761**	**17,851,859**

Figure 9-1, which shows the number and percentage of vehicles produced for each fuel type for model year 2017, illustrates the dominance of gasoline fueled vehicles in the U.S. market. This figure represents the model year 2017 column of Table 9-3.

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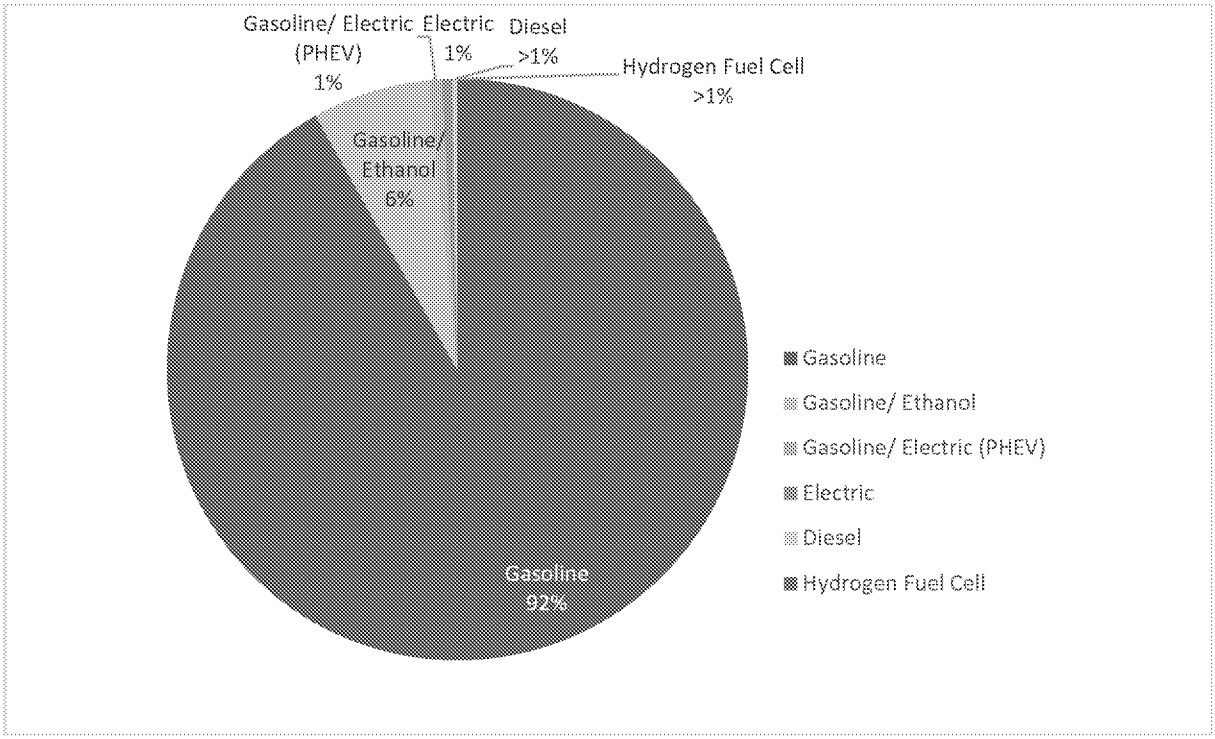

Figure 9-1: Light-Duty Vehicle Production by Fuel Type, Model Year 2017

The Figure 9-1 pie chart shows light-duty vehicle production by fuel type for only model year 2017; in contrast, Figure 9-2 and Figure 9-3 show light-duty vehicle production by fuel type for all four model years, 2014 – 2017 (all four years included in Table 9-3). Figure 9-3 shows light-duty vehicle production by alternative fuel type for model year 2014-2017. That is, this figure omits gasoline and gasoline/ethanol fuel types so that the other fuel types are more easily compared. In other words, the bars in Figure 9-3 are the tops of the bars in Figure 9-2; note the difference in scales in these two figures. As seen in these figures, U.S. production of diesel-fueled light-duty vehicles has declined over the four-year period, while production of electric vehicles has steadily increased. Production of plug-in hybrid vehicles in model year 2017 is more than double that of model year 2014. (The colors representing the fuel types are consistent across Figure 9-1, Figure 9-2, and Figure 9-3.)

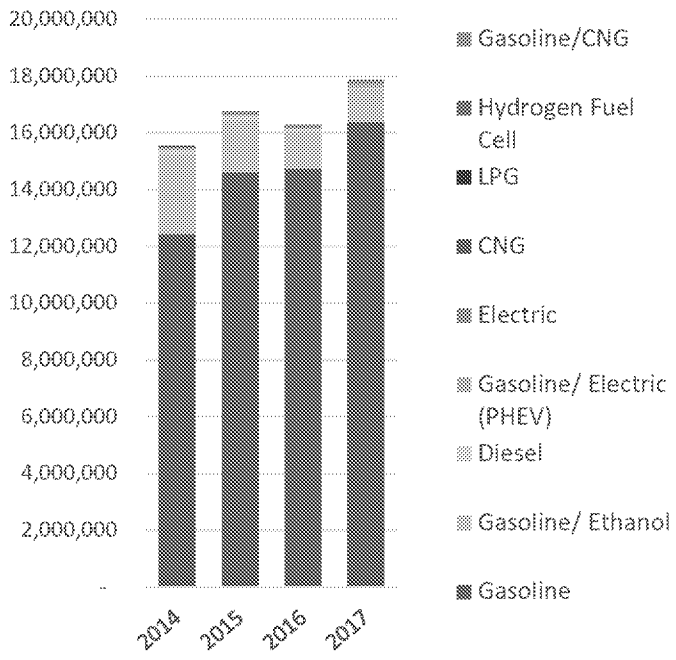

Figure 9-2: Light-Duty Vehicle Production Volume by Fuel Type, Model Years 2014 - 2017

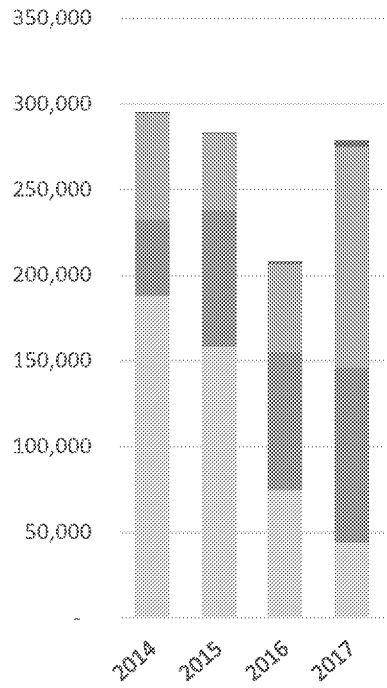

Figure 9-3: Light-Duty Vehicle Production Volume by Alternative Fuel Type, Model Years 2014 - 2017

9.2 Alternative Fuel Conversions

Table 9-4 shows the number of EPA-listed alternative fuel conversion kits for model years 2014 – 2017. This table includes both light-duty and heavy-duty vehicle alternative fuel conversion kits.

Table 9-4: Alternative Fuel Conversions by Program Type, Model Years 2014 - 2017

Program	MY 2014	MY 2015	MY 2016	MY 2017
Intermediate Age	42	68	20	5
Outside Useful Life	10	2	1	1

9.2.1 Light-Duty Vehicles

Vehicles originally designed and certified to operate on a given fuel (typically gasoline or diesel fuel) can be converted to operate on a different fuel. The Clean Air Act prohibits changing a vehicle's certified configuration, but EPA regulations establish processes through which conversion manufacturers may avoid violating the tampering prohibition. The process for converters of new vehicles is much like the certification process for original equipment manufacturers and involves obtaining a Certificate of Conformity. The regulations establish alternative pathways that do not involve certification for conversion systems intended for use on older vehicles and engines (40 CFR part 85, subpart F).

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In the light-duty vehicle alternative fuel conversion sector, a total of 25 Alternative Fuel Conversion Manufacturers were issued conversion certificates for MYs 2014 – 2017. These manufacturers are listed in Table 9-5, which shows the number of test groups for light-duty vehicle alternative fuel conversions by alternative fuel type in 2014 - 2017.

Table 9-5: Light-Duty Alternative Fuel Conversion Test Groups by Manufacturer, Model Years 2014 - 2017

Alternative Fuel Type	Manufacturer	Light-Duty Alternative Fuel Conversion Test Groups			
		2014	2015	2016	2017
CNG	AC Spolka Akcyjna	2	4	0	0
	AGA Systems, LLC	4	4	4	5
	Altech-Eco Corporation	8	6	14	15
	BAF Technologies	7	3	0	0
	CNG Interstate of Oklahoma, LLC	2	2	0	0
	Crazy Diamond Performance Inc.	1	1	1	0
	Encore TEC LLC	0	0	1	3
	IMPCO Technologies, Inc.	6	7	9	0
	Landi Renzo USA Corporation	2	1	3	8
	M-tech Solutions Inc	1	1	1	0
	Nat Gas Car LLC	5	2	1	0
	PowerFuel CNG Conversions, LLC	7	1	2	1
	STAG USA	0	0	2	2
	The CNG Store, LLC; dba Auto Gas America	5	0	0	0
	Westport Dallas, Inc	0	0	6	5
	Westport Power Inc.	1	1	0	0
	World CNG	3	5	0	0
LPG	AGA Systems, LLC	0	0	3	2
	American Alternative Fuel	2	1	0	0
	Blossman Services, Inc.	8	11	14	13
	CleanFuel USA Inc.	0	4	3	2
	Icom North America LLC	11	9	29	25
	Imega International USA	0	1	0	0
	IMPCO Technologies, Inc.	2	3	4	1
	Roush Industries, Inc.	2	1	1	0
	STAG USA	0	0	4	2
	Westport Dallas, Inc	0	0	4	6
	Yellow Checker Star Transportation	0	1	2	1
PHEV	VIA Motors, Inc.	1	1	0	0
Total:		**80**	**70**	**108**	**91**

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9.2.2 Heavy-Duty Highway Engines

Table 9-6 presents the heavy-duty highway engines that were certified to operate on alternative fuels in model years 2014 – 2017 by their original manufacturer. Table 9-7 shows the heavy-duty highway alternative fuel conversion certificates issued for those same model years.

Table 9-6: Heavy-Duty Highway Engine Alternative Fuel Engine Families by Original Equipment Manufacturer, Model Years 2014 - 2017

Alternative Fuel Type	Manufacturer	MY 2014	MY 2015	MY 2016	MY 2017
LPG	CleanFuel USA Inc.	0	0	1	2
	Greenkraft Inc.	0	0	1	0
	Power Solutions International, Inc.	0	0	0	2
Natural Gas	Cummins Inc.	4	5	3	8
	Greenkraft Inc.	0	0	2	1
	Landi Renzo USA Corporation	0	1	0	0
	Power Solutions International, Inc.	0	0	0	2
	Roush Industries, Inc.	0	0	1	1
Propane	Greenkraft Inc.	0	0	1	1
Total:		**4**	**6**	**9**	**17**

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Table 9-7: Heavy-Duty Highway Engine Alternative Fuel Conversion Certificatiificates by Manufacturer, Model Years 2014 - 2017

Alternative Fuel Type	Manufacturer	MY 2014	MY 2015	MY 2016	MY 2017
CNG	Encore TEC LLC	0	0	6	4
	Greenkraft Inc.	2	3	0	1
	IMPCO Technologies, Inc.	3	3	4	2
	Landi Renzo USA Corporation	3	3	3	3
	NGV Motori, USA, LLC	2	1	0	1
	Omnitek	1	1	0	0
	Power Solutions International, Inc.	0	1	1	0
	Westport Dallas, Inc/BAF	2	2	2	2
CNG/Gasoline	AGA Systems, LLC	4	1	1	1
	IMPCO Technologies, Inc.	1	1	0	0
	Landi Renzo USA Corporation	1	1	0	0
	Westport Dallas, Inc/BAF	1	0	0	0
LPG	Bi-Phase Technologies, LLC.	3	1	1	0
	Clean Fuel USA Inc.	2	2	0	0
	Greenkraft Inc.	2	1	0	1
	Icom North America LLC	1	1	0	2
	Parnell	0	0	2	0
	Power Solutions International, Inc.	0	1	3	0
	Propane Fuel Technologies LLC	0	1	0	0
	Roush Industries, Inc.	2	4	2	2
LPG/Gasoline	Blossman Services, Inc.	1	2	0	1
	Icom North America LLC	0	0	0	2
CNG/Diesel	Clean Air Power	0	1	0	0
Total		**31**	**31**	**25**	**22**

9.2.3 Nonroad Spark Ignition Engines

There are numerous engine manufacturers that certify nonroad spark ignition engines to run on alternative fuels in both the small SI and large SI categories.

Small Spark Ignition Engines

Table 9-8 shows the model years 2014-2017 alternative fuel small spark ignition engine families certified, by type of alternative fuel and manufacturer.

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Table 9-8: Small Spark Ignition Engine Families by Fuel Type, Model Years 2014 -2017

Fuel Type	Manufacturer	MY 2014	MY 2015	MY 2016	MY 2017
Gasoline - E85	Kohler Co.	1	1	1	1
Natural Gas	Aisin World Corp. of America	2	2	1	1
	Arrow Engine Company	6	6	5	5
	Cummins Power Generation	2	2	2	2
	Diadema Engine	2			
	Kubota Corporation	1	1	1	1
	Repair Processes, Incorporated	1	1	1	1
	Yanmar Co., Ltd.	2	2	1	3
Natural Gas/Propane	Aisin World Corp. of America			1	1
	American Honda Motor Co., Inc.	1	1	1	1
	Briggs & Stratton Corporation	5	5	4	3
	Carburetion & Turbo Systems, Inc.	1	1	1	1
	Chongqing Dajiang Power Equipment Co.,Ltd.	2	2	3	4
	Fuji Heavy Industries	1	1	1	1
	Generac Power Systems, Inc.	6	4	4	5
	Kohler Co.	1	4	4	4
	Lifan Industry (Group) Co., Ltd.	3	3	1	
	Marathon Engine Systems		1	1	1
	New England Gen-Connect LLC			2	2
	Shanghai Chenchang Power Technology Co., Ltd		2		
	Shanghai Grow Development Co., Ltd.	2			
	Zhejiang Yaofeng Power Technology Co., Ltd.		2	2	3
Natural Gas/ Propane/Gasoline	Chongqing Dajiang Power Equipment CO.,LTD	2	2	3	5
	Chongqing Maifeng Power Machinery Co., Ltd	2	4	4	4
	Chongqing Sanding General Power Machinery Co., Ltd.	2	4	4	4
	Gaoyou City Shenfa Electrical and Mechanical Manufacture Co.,Ltd			3	3
	Kohler Co.			1	2
	Kubota Corporation		1	1	1
	Lifan Industry (Group) Co., Ltd.	1	1	3	4
	Wenling Jennfeng Industry Inc.	1	2	2	2
	Winco	1	1	1	1
Propane	Amano Pioneer Eclipse Corporation	1	1	1	1
	Aztec Products Inc.	3	3	4	4
	BETCO Corporation	1	1	1	1
	Blossman Services, Inc.	1	1		

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Fuel Type	Manufacturer	MY 2014	MY 2015	MY 2016	MY 2017
	Briggs & Stratton Corporation				1
	Carburetion & Turbo Systems, Inc.		1	1	1
	China Xingyue Group Co.,Ltd.	1	1	1	
	Cummins Power Generation	3	3	3	3
	Feldmann Eng. & Mfg. Co., Inc.	2	2	2	2
	Fuji Heavy Industries	1	1	1	1
	Fuzhou Launtop M&E Co., Ltd.		2	2	2
	Gaoyou City Shenfa Electrical and Mechanical Manufacture Co.,Ltd		3		
	Generac Power Systems, Inc.	3	2	2	2
	Hendrix Industrial Gastrux, Inc.	3	3	3	3
	Jiangsu Jiangdong Group Co. Ltd.	4	4	4	4
	Kawasaki Motors Corp., U.S.A.	1	1	1	1
	Kohler Co.	2	2	1	3
	LEHR LLC		4	4	4
	Linyi Sanhe Yongjia Power Co.,Ltd.	1	1		
	Loncin Motor Co., Ltd.	2	2	2	2
	METROLAWN, LLC	7	8	8	
	New England Gen-Connect LLC			1	1
	Nilfisk Advance	2	2		1
	Onyx Environmental Solutions	2	2		
	Propane Power Systems, LLC		3	5	7
	Shandong Yongjia Power Co., Ltd.			1	1
	Shanghai Chenchang Power Technology Co., Ltd		1		
	Shanghai Grow Development Co., Ltd.	1			
	STK LLC	2	2	2	2
	Superabrasive Inc.			1	1
	Tacony Corporation	1	1	1	1
	TWEnterprises				1
	Whitestorm Inc.	1	1	1	1
	Yanmar Co., Ltd.	2	2		2
	Zhejiang Xingyue Industry Co.,Ltd				2
	Zhejiang Yaofeng Power Technology Co., Ltd.	1	1		
Propane/Gasoline	ChongQing AM Pride Power & Machinery Co., Ltd			1	1
	Chongqing Huansong Science And Technology Industrial Co.,Ltd.	1	1	1	1
	Gaoyou City Shenfa Electrical and Mechanical Manufacture Co.,Ltd		3		
	Kubota Corporation	3	3	3	3
	Power Solutions International, Inc.	1	1	1	1

Fuel Type	Manufacturer	MY 2014	MY 2015	MY 2016	MY 2017
	Sumec Machinery & Electric Co., Ltd.			2	2
	Wenling Jennfeng Industry Inc.	2	6	4	5
	Yongkang Xingguang Electrical Manufacture Co., Ltd	8	8	8	7
	Yueqing Hejie Electric Co., Ltd	3			
	Zhejiang Constant Engine Mading Co., Ltd.		1		
	Zhejiang Yaofeng Power Technology Co., Ltd.	2	2	5	6
Total		**116**	**142**	**137**	**147**

Table 9-9 provides a summary of Table 9-8, showing alternative fuel small spark ignition engine families by fuel type only.

Table 9-9: Small SI Engine OEM Alternative Fuel Engine Families, Model Years 2014 - 2017

Fuel Type	Number of Engine Families			
	MY 2014	MY 2015	MY 2016	MY 2017
Gasoline - E85	1	1	1	1
Natural Gas	16	14	11	13
Natural Gas/Propane	22	26	25	26
Natural Gas/Propane/Gasoline	9	15	22	26
Propane	48	61	53	55
Propane/Gasoline	20	25	25	26
Total	**116**	**142**	**137**	**147**

Large Spark Ignition Engines

Table 9-10 shows the model years 2014-2017 alternative fuel large spark ignition engine families certified, by type of alternative fuel and manufacturer.

Table 9-10: Alternative Fuel Large Spark Ignition Manufacturers, Model Years 2014 - 2017

Fuel Type	Manufacturer	MY 2014	MY 2015	MY 2016	MY 2017
Natural Gas	2G Energietechnik GmbH			1	1
	Aegenco, Inc.		1	1	1
	Briggs & Stratton Corporation			1	
	Bucks Engines	4	4		
	Caterpillar Inc.			2	2
	Cummins Inc.	7	6	6	7
	Deutz AG	2	5	5	5
	ENER-G Rudox Inc.	2	3	3	2
	Engine Distributors, Inc.	1	1	1	3
	GE Jenbacher, Ltd.	1	1	1	1

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Fuel Type	Manufacturer	MY 2014	MY 2015	MY 2016	MY 2017
	Generac Power Systems, Inc.	34	33	36	41
	Graham Ford Power Products	1	2		
	Guascor Power S.A.U.	5	8	8	8
	IMPCO Technologies, Inc.	2	2		
	Industrial Engines Ltd.	2	1	1	
	KEM Equipment, Inc.	1	1		
	Kohler Co.	2	2	3	3
	Mitsubishi Heavy Industries Engine & Turbocharger, Ltd.				2
	Mitsubishi Heavy Industries, Ltd.	2	2	2	
	Power Solutions International, Inc.	1	1	1	1
	Tecogen				4
	Weichai America Corporation		2		1
	Wisconsin Engines, LLC.			1	
	Wisconsin Motors, LLC.	1	1		
	Yanmar Co., Ltd.			1	2
	Zenith Power Products	1	1		
Natural Gas/Propane	Bucks Engines	2	2		
	Caterpillar Inc.	1	1	1	1
	Chongqing Panda Machinery Co., Ltd.	2	3	2	2
	Computer Science				1
	Cummins Inc.	5	6	8	10
	Don Hardy Race Cars, Inc.	1	1	1	1
	Dresser, Inc.	1	1	1	3
	Engine Distributors, Inc.				1
	Generac Power Systems, Inc.			1	1
	Graham Ford Power Products			1	
	KEM Equipment, Inc.	9	9	10	10
	Kubota Corporation	1	1	1	
	MTU America, Inc.		5	5	7
	Origin Engines	2	3	3	4
	Power Solutions International, Inc.	14	14	13	13
	Springfield Remanufacturing Corp.			1	4
	SRC Power Systems, Inc.	5	4	3	
	Tognum America, Inc.	3			
	Weichai America Corporation				1
	Westport Power Inc.	1	1	2	1
	Zenith Power Products	2	3	7	7
Natural Gas/Propane/Gasoline	Engine Distributors, Inc.	3	4	4	4
	IMPCO Technologies, Inc.	1	1		

Fuel Type	Manufacturer	MY 2014	MY 2015	MY 2016	MY 2017
	Kubota Corporation	3	5	5	5
	Power Solutions International, Inc.	2	3	6	6
	Toyota Industrial Equipment Manufacturing, Inc.	1	1	1	1
	Zenith Power Products	2	3	3	3
Propane	Bucks Engines	1	1		
	Crown Equipment Corporation	1	1	1	2
	Engine Distributors, Inc.	1	1	1	3
	Generac Power Systems, Inc.	21	21	22	22
	Graham Ford Power Products	1	2	2	1
	IMPCO Technologies, Inc.	3	4	2	
	KEM Equipment, Inc.	2	2	2	2
	KION North America Corp.			2	2
	Kohler Co.	2	2	3	3
	Linde Material Handling N.A. Corp.	2	2		
	Power Solutions International, Inc.	2	2	3	4
	Weichai America Corporation				1
	Westport Power Inc.				1
	Woodward, Inc.	1	1	1	
Propane/Gasoline	Bucks Engines	2	2		
	EControls, Inc.	1		1	1
	Global Component Technologies Corporation	3	3	3	3
	IMPCO Technologies, Inc.	3	2	2	
	KEM Equipment, Inc.	3	3	3	3
	Kubota Corporation	1	1	1	1
	Power Solutions International, Inc.	2			
	Toyota Industrial Equipment Manufacturing, Inc.	1	1	1	1
	Westport Power Inc.				1
	Wisconsin Engines, LLC.			1	1
	Wisconsin Motors, LLC.	1	1		
	Woodward, Inc.	2	2	1	1
	Zenith Power Products	3	2	2	
Total:		**189**	**204**	**207**	**223**

Table 9-11 provides a summary of Table 9-10, showing alternative fuel small spark ignition engine families by fuel type only.

Table 9-11: Large SI Engine OEM Alternative Fuel Engine Families, Model Years 2014-2017

Fuel Type	Number of Engine Families			
	MY 2017	MY 2017	MY 2017	MY 2017
Natural Gas	69	77	74	84
Natural Gas/Propane	49	54	60	67
Natural Gas/Propane/Gasoline	12	17	19	19
Propane	37	39	39	41
Propane/Gasoline	22	17	15	12
Total	**189**	**204**	**207**	**223**

9.2.4 Recreational Vehicles

The majority of recreational vehicles are certified to operate on gasoline. However, a small number of manufacturers certified recreational vehicles to operate on diesel fuel in model year 2014 – 2017, as shown in Table 9-12.

Table 9-12: Recreational Vehicle OEM Diesel Engine Families by Manufacturer, Model Years 2014-2017

Manufacturer	Number of Engine Families			
	MY 2014	MY 2015	MY 2016	MY 2017
Deere & Company	1	1	1	1
JCB, Inc.	1			
Polaris Industries Inc.	1			

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Appendix: Additional Information from the National Emissions Inventory

National Emissions Inventory 2014

The National Emissions Inventory (NEI) report for 2014 illustrates that emissions of most pollutants have declined over time, as seen in Figure 9-4.[42]

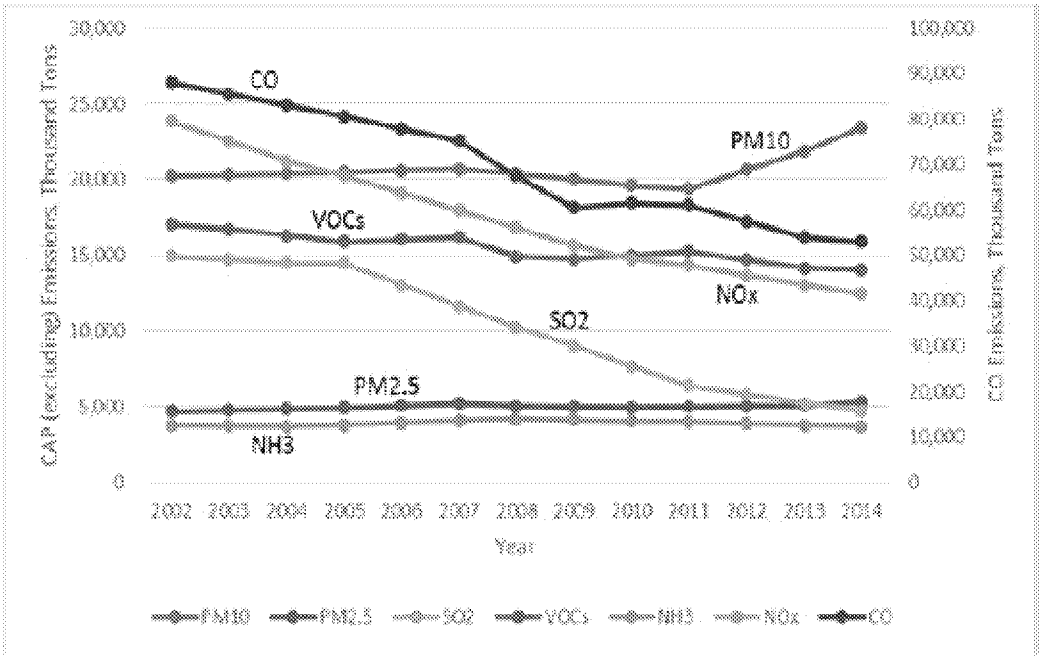

Figure A-1: Pollutant Emission Trends, 2002 - 2014, (Wildfires Omitted)

As the NEI is developed on a three-year cycle, the 2014 NEI report compares the level of pollutants emitted in 2011 and 2014. As seen in Table A-1, below, anthropogenic emissions of most pollutants have declined in this period of time, with the exception of PM_{10}.[43]

[42] EPA Office of Air Quality Planning and Standards, "Profile of Version 1 of the 2014 National Emission Inventory, U.S. EPA 2014 NEI Version 1.0" April 2017, found on EPA's web page at www.epa.gov/sites/production/files/2017-04/documents/2014neiv1_profile_final_april182017.pdf.

[43] PM10 includes dust that is created from vehicles driving, agricultural activities, construction activities, etc.

Table A-1: Total Emissions, All Sectors 2011 NEI vs. 2014 NEI[44]

Pollutant	Anthropogenic, x1000 Tons (Man-made)		Biogenic, x1000 Tons (Natural)		Total, x1000 Tons		Percent Change, 2011 to 2014
	2011	2014	2011	2014	2011	2014	
CO	75,760	63,252	6,528	6,635	82,288	69,907	-15
NH_3	4,316	3,869	NA	22.2	4,316	3,891	-10
NOx	14,574	12,643	1,018	903	15,592	13,546	-13
PM_{10}	20,907	24,506	NA	NA	20,907	24,506	17
$PM_{2.5}$	6,306	6,223	NA	NA	6,306	6,223	-1.3
SO_2	6,557	4,812	NA	NA	6,557	4,812	-26
VOCs	18,169	16,478	39,653	38,679	57,822	55,157	-5
Pb	0.80	0.73	NA	NA	0.80	0.73	-9
BC (same as EC)	567	446	NA	NA	567	446	-21

While emissions of pollutants declined over this period, there are still many areas of the country where air quality exceeds the National Ambient Air Quality Standards.[45,46]

Figure A-2 provides information from the NEI for four regulated pollutants: $PM_{2.5}$, nitrogen oxides (NOx), volatile organic compounds (VOCs), and CO.[47] These four pollutants are produced by many types of engines, industries, and commercial operations. Figure 9-5 shows the contribution of each type of emissions source, to the overall emissions inventory for each of these pollutants. In Figure 9-5, emissions have been grouped into the following source categories:

- Events, which include agricultural field burning, prescribed fires, and wildfires;
- Non-Point, which include smaller abundant sources such as small businesses, residential heating, commercial and consumer solvent use;
- Point, which are the larger emission sources at a fixed stationary location such as industrial facilities and power plants; and
- Mobile, which include onroad vehicles, nonroad equipment, aircraft, locomotives, marine vessels, and gas stations (VOCs only).

[44] EPA Office of Air Quality Planning and Standards, "Profile of Version 1 of the 2014 National Emission Inventory, U.S. EPA 2014 NEI Version 1.0" April 2017, found on EPA's web page at www.epa.gov/sites/production/files/2017-04/documents/2014neiv1_profile_final_april182017.pdf.

[45] EPA sets National Ambient Air Quality Standards for the pollutants ozone, CO, PM_{10}, $PM_{2.5}$, nitrogen dioxide (NO_2), lead, and SO_2. Ozone is not directly emitted, but forms in the atmosphere from volatile organic compounds (VOCs) and nitrogen oxides (NOx). For more information, see EPA's web page at www.epa.gov/criteria-air-pollutants.

[46] For a list of areas where concentrations of pollutants are above the National Ambient Air Quality Standards, see EPA's Green Book web page at www.epa.gov/green-book.

[47] EPA establishes national ambient air quality standards (NAAQS) for $PM_{2.5}$, CO, and ozone, among other pollutants. The precursors to ozone formation are NOx and VOCs. For more information about these pollutants, including health effects, see EPA's web page www.epa.gov/criteria-air-pollutants. More information about the NAAQS and which areas are not meeting these NAAQS is available on EPA's webpage at: www.epa.gov/green-book.

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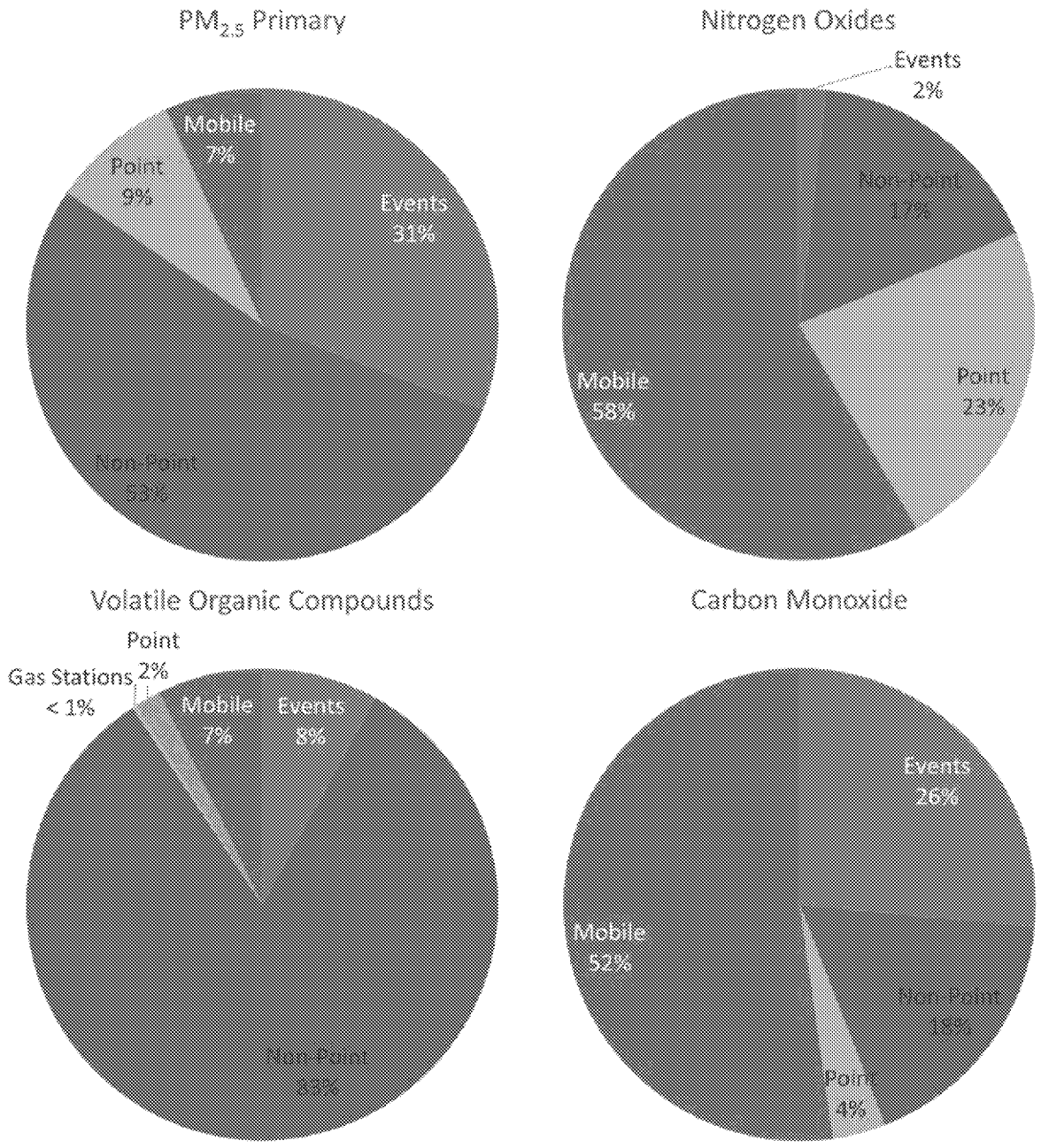


Figure A-2: U.S. Emissions by Source Category, 2014

As shown in this figure, mobile sources account for about 7% of the emissions of both $PM_{2.5}$ and VOCs, and more than half of the NOx and CO emissions nationwide.

Message

From: Bunker, Byron [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DDF7BCF023D241A9A477A2DC75D5901C-BUNKER, BYRON]
Sent: 4/16/2019 10:20:26 AM
To: Hebert, Annette@ARB [annette.hebert@arb.ca.gov]; allen.lyons@arb.ca.gov
Subject: EPA Draft Compliance Report
Attachments: compliance report draft 2019-04-11.docx

Hi Annette and Allen,

I am sorry that I didn't get this sent out yesterday. Copied just below is a link to our previous Compliance Reports and attached is the draft report that we are hoping to release next week. Please hold this draft internal to CARB and replace it with the final version which I will share when we issue the report. We would be glad to schedule time to talk about any elements of the report, just let us know.

https://www.epa.gov/vehicle-and-engine-certification/compliance-activity-reports-vehicles-and-engines

Thanks,

Byron

****
Byron Bunker
Director Compliance Division
Office of Transportation and Air Quality
Environmental Protection Agency
2000 Traverwood Drive
Ann Arbor, MI 48105
Bunker.Byron@epa.gov
Phone: (734) 214-4155
Mobile: (734) 353-9623
****

Message

From: Ellies, Ben [ellies.ben@epa.gov]
Sent: 6/20/2017 5:35:44 PM
To: OAR-OTAQ (AA) [OAROTAQ_AA@epa.gov]
Subject: materials from last week's autonomous vehicles brown bag
Attachments: Autonomous Vehicle Brown Bag - Ellies 061417.pptx

All,

In case you couldn't make it to last week's autonomous vehicles brown bag – or if you did, and wanted to see some of the materials again – here are the slides and included references.

Thanks for coming!

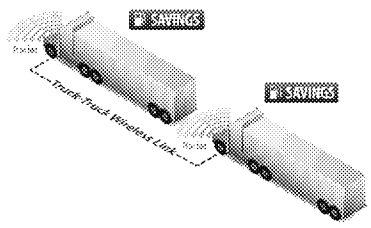
Ben

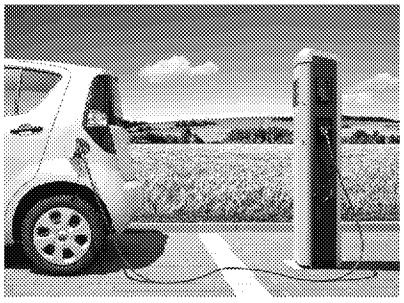
Benjamin Ellies
EPA Office of Transportation and Air Quality
2000 Traverwood Drive
Ann Arbor, MI 48103
(734) 214-4496

OTAQ Brown Bag Series

LD & HD Technology Penetration

Watts the deal with electric vehicles and platooning??





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Agenda

- Benefits of driving electric
- Myths and facts
- Projected EV adoption rates
- HD Technology - Platooning

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The Benefits of Driving Electric

Save money
"Plug in" and spend far less than you do at the gas pump

Fact:
Driving electric can save you more than 70% on fuel costs.

Clear the air
Say goodbye to tailpipe emissions

Fact:
Driving electric means no tailpipe emissions, helping to preserve the environment.

Support energy independence
Fuel your car with American-made energy

Fact:
Electricity is made from largely domestic sources helping to reduce the dependence on foreign oil.

Enjoy the ride!
Feel the excitement of quick, quiet and smooth acceleration

Fact:
Electric vehicle owners tend to have higher satisfaction levels with their cars compared to non-electric vehicle owners.

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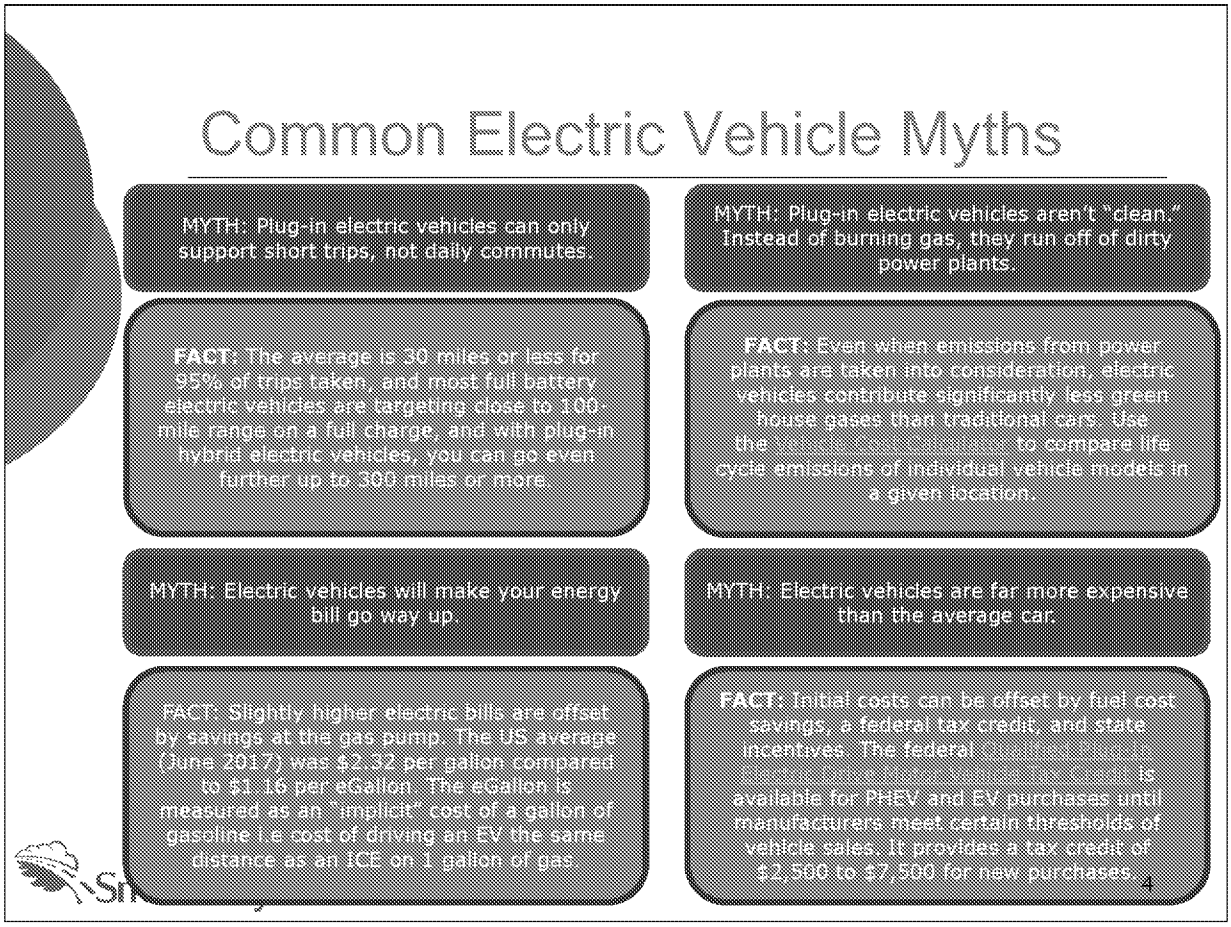
3

Fuel Economy
Because PHEVs and EVs rely in whole or part on electric power, their fuel economy is measured differently than that of conventional vehicles. Miles per gallon of gasoline equivalent (mpge) and kilowatt-hours (kWh) per 100 miles are common metrics. Depending on how they're driven, today's light-duty EVs (or PHEVs in electric mode) can exceed 100 mpge.

Energy Independence
In 2015, the United States imported about 24% of the petroleum it consumed, and transportation was responsible for nearly three-quarters of total U.S. petroleum consumption.
Tesla took a step toward becoming a mass-producer this month when the $35,000 Model 3 sedan started rolling off a California assembly line. And they have created a new "cool" factor around electric vehicles that was previously lacking.
Volvo said it will begin phasing out cars that run just on fossil fuels in two years. France plans to eliminate gasoline- and diesel-powered vehicles entirely by 2040.

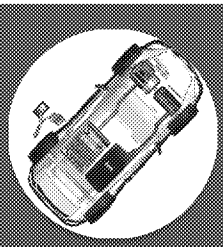


New Vehicles are already expensive: New vehicles today are already approaching $35,000 on average. With declining battery costs the point of parity is closer than we think, by some studies reaching equilibrium in 2022. Automakers are pouring billions into an uncharted electric future because the cars are getting cheaper more quickly than expected

Cheaper operating costs: While EVs may cost more upfront at the moment, fueling and maintenance costs are generally much cheaper. This isn't really captured in current vehicle finance models, but if it was it could be an important factor.

The eGallon represents the cost of driving an electric vehicle (EV) the same distance a gasoline-powered vehicle could travel on one (1) gallon of gasoline. The "eGallon" is measured as an "implicit" cost of a gallon of gasoline. It is calculated by multiplying the average U.S. residential electricity price (EP) by the average comparable passenger car adjusted combined fuel economy (FE) by the average fuel consumption of popular electric vehicles (EC)

Electric Vehicle Types



Plug-in Hybrid Electric Vehicle (PHEV)

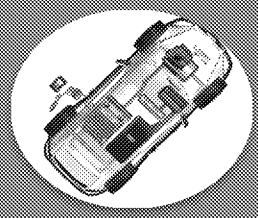
Plug-in hybrid electric vehicle Electric motor and ICE engine

Electric range 10-40 miles

Blended electric/gas at higher speeds

2-9 kWh

Ex: Prius Plug-in



Extended Range Electric Vehicle (EREV)

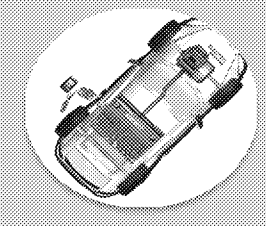
Electric vehicle with "Extended Range"

All electric for 35-40 miles

Gas generated for 300+ miles

8-10 kWh

Ex: Chevy VOLT



Battery Electric Vehicle (BEV)

Battery electric vehicle

Powered by electricity only

Electric range for 80-300

Zero emissions

16-85 kWh

Ex: Nissan LEAF, Tesla S

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Electric Vehicle Charging Infrastructure

	AC Charging Home, Fleet and Public Use		DC Fast Charging Public and Large Fleet Use	
Type	Level-1	Level-2	Level-1	Level-2
Power	120V, 1.4 kW @ 12 amp 120V, 1.9 kW @ 16 amp	240V, up to 19.2 kW (80 amp)	200-500V, up to 40 kW (80 amp)	200-500V, up to 100kW (200 amp)
Charge Time (Miles of range per hour of charge)	3 to 5 miles	3.3 kW – 10 to 14 miles 6.6 kW – 20 to 25 miles 9.6 kW – 40 to 45 miles 19.2 kW – up to 60 miles	40 kW – up to 120 miles	100 kW – up to 300 miles

Cost and complexity tends to increase the faster the charging level

The theoretical energy density for a lithium-air battery is 5,200 Wh/kg which is comparable to that of gasoline. Such a battery would use oxygen from air and therefore would not need to store an oxidizer.

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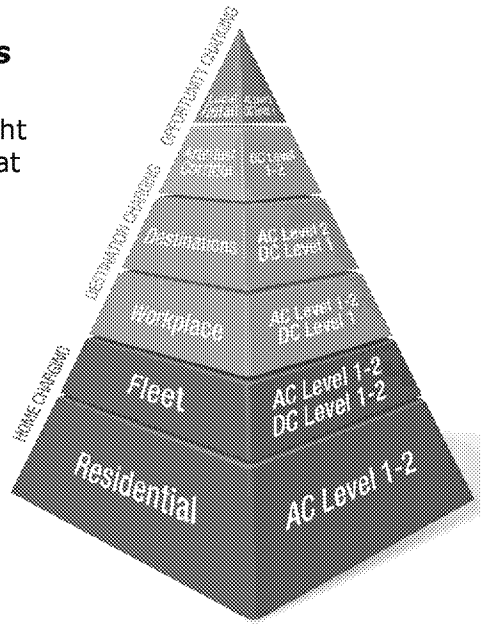
Level 1 charging is the technical jargon for plugging your car into an ordinary household outlet.
Level 2 supplies 240V, like what an electric dryer or oven uses. It goes through a box and a cord that improves safety by waiting to send power to the plug until it's plugged into an EV. Level 2 allows for a wide range of charging speeds, all the way up to 19.2 kilowatts (kW), or up to 60 miles per hour of charge.
At the other end of the spectrum is DC Fast Charging, the fastest type of charging currently available. These stations are expensive (up to $100,000) and require more power than your house, so you'll never have one of these in your garage.
The speed of charging is never the same at 1% of charge as it is at 99% of charge. Basically, when your battery is closer to empty, electricity can flow in at a rapid pace. As it gets filled up, though, that rate must slow. This is called "tapering," and you'll notice it beginning at around 50% of charge, but it gets really strong above ~80%. So while it may seem illogical, disconnecting a battery once it reaches 80% can theoretically improve the long-term health and therefore range of the battery. This is especially true to lithium-ion batteries. Additionally, as the battery increases in charging, more heat is built up and this can lead to degradation of the battery over time. Tip for cell phones...

Charging Locations

- **More than 80 percent of residential and fleet charging is done at "home"**
  - "Home refueling," charging overnight at home for personal vehicles and at work for fleet vehicles
- **Workplace charging is on the rise and supports electric vehicle adoption**
  - Provides charge for those without dedicated home charging
  - Extends daily range
- **Public: Allows for mass adoption**
  - Relieves "range anxiety"
  - BEST in destination locations or along major highway corridors



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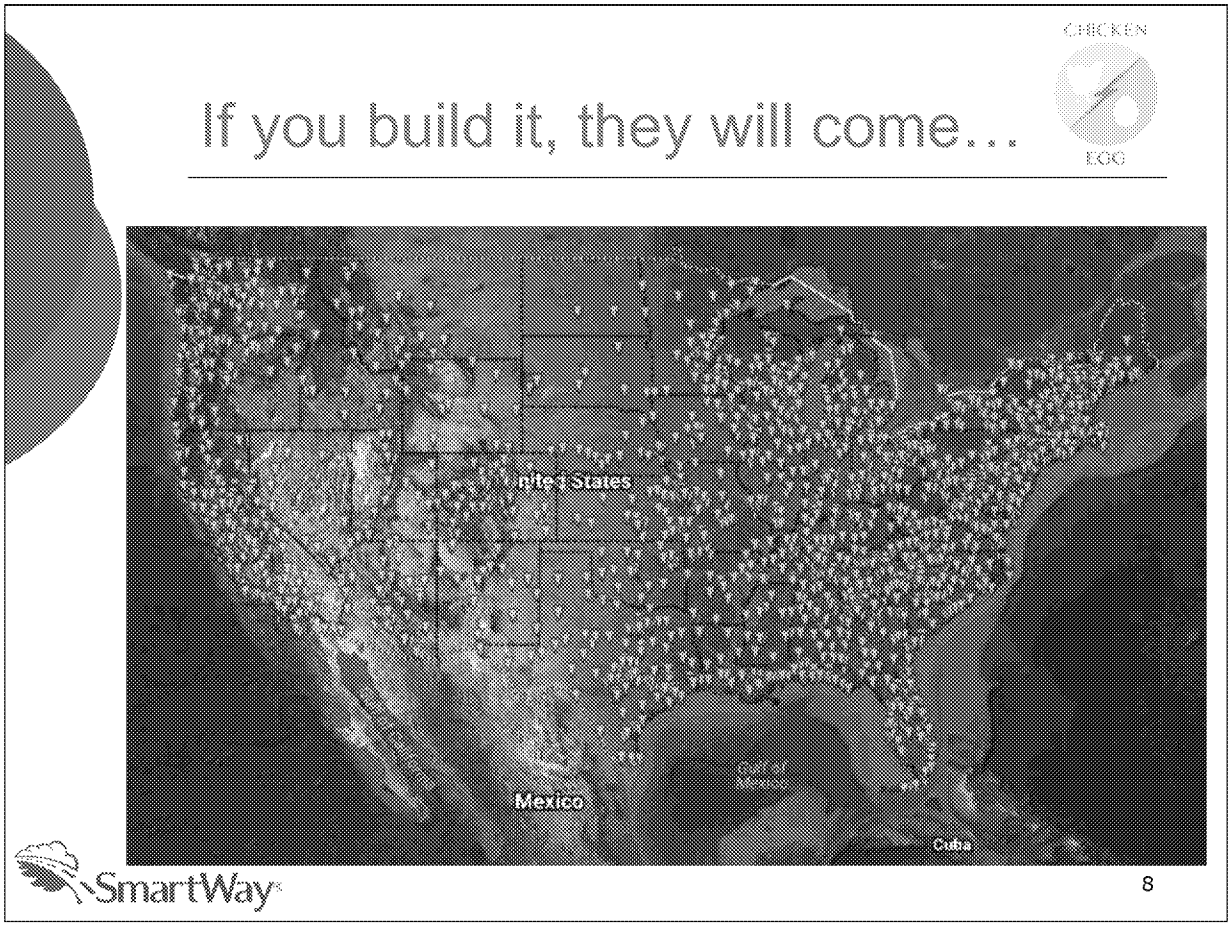
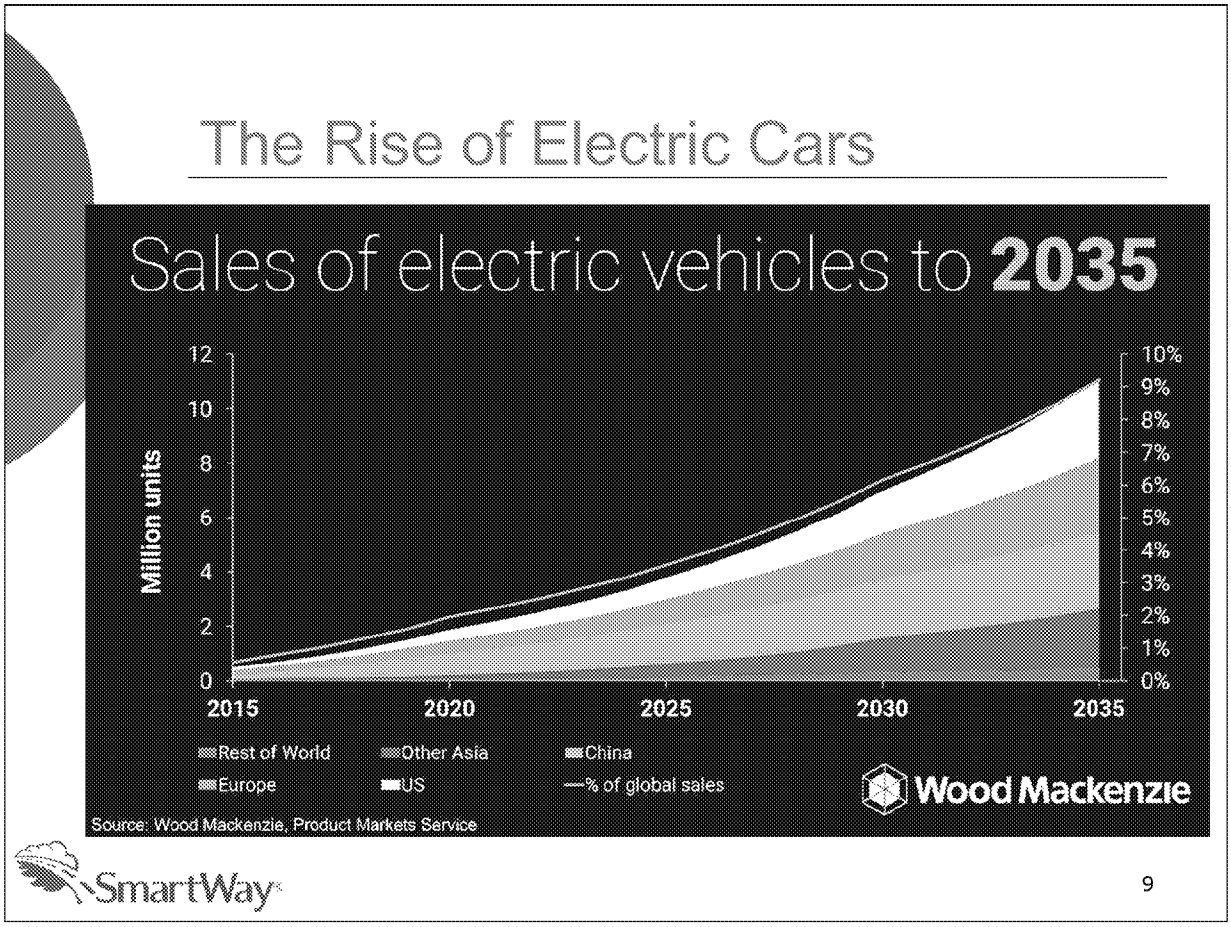
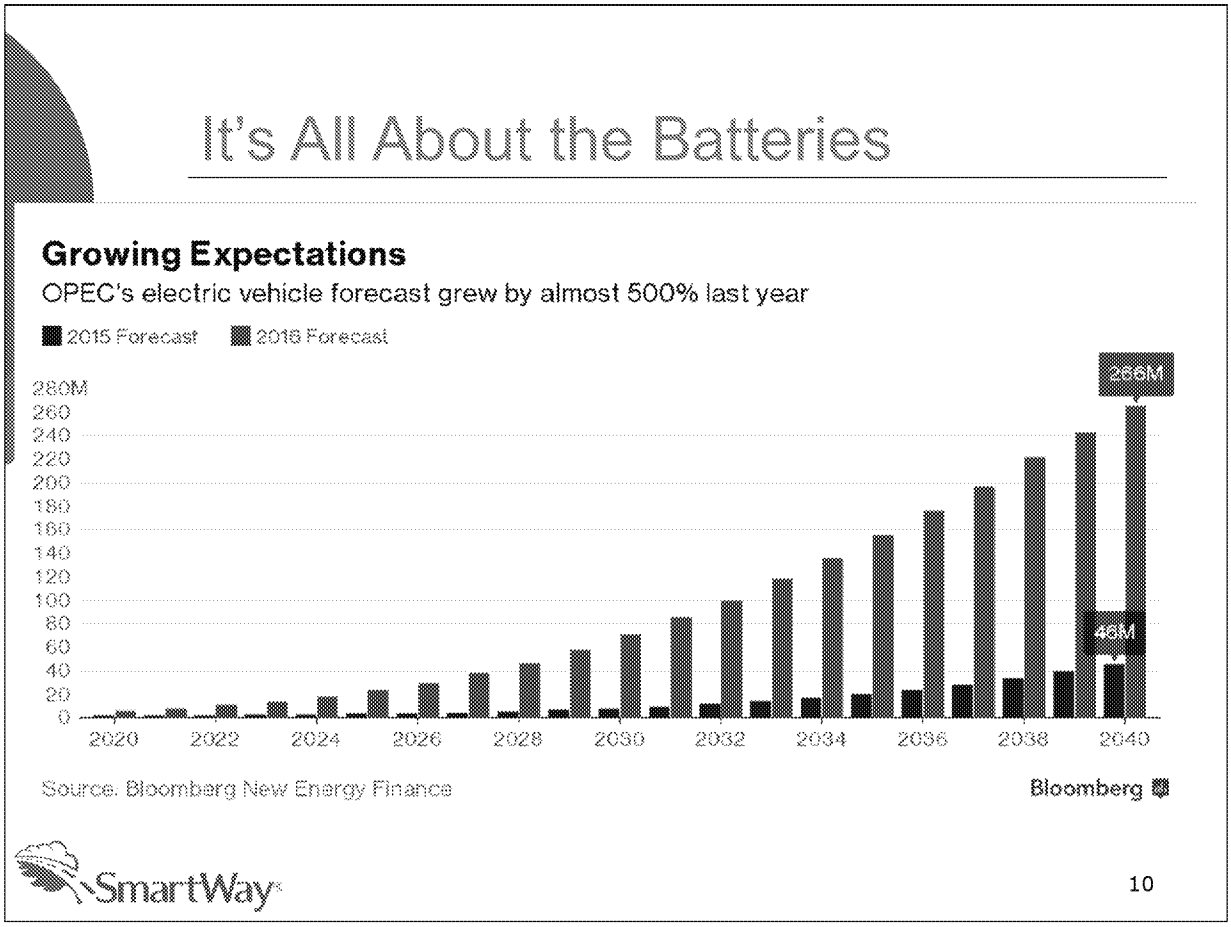


Innovation in electric vehicles (EVs) and EV charging, supported by a dynamic marketplace, has fueled record-breaking EV adoption over the past year.
With EVs predicted to see substantial growth, the question becomes how to ensure that there is smart charging infrastructure in place to meet the expected demand, support a competitive marketplace, maintain affordability and help provide reliability to our nation's electric grid.
Tesla is changing the game: The 400,000 preorders for the model 3 opened up a lot of eyes. Tesla is doing everything different from the dealerships, to the charging network, to autopilot and is disrupting the industry Finally they just passed Ford in terms of market cap.
16,105 Electric Stations
43,388 Charging Outlets
VW settlement: "Electrify America" future investments in infrastructure to support EVs (Annex C)
Anecdotally: Robert Metcalfe, American electrical engineer and co-founder of the Ethernet, formulated Metcalfe's Law, otherwise known as 'Network Effects'.
Network effects state that with the addition of each new 'node', or participant, in a network, the power of that network increases proportionally to the square number of total nodes. More simply: the more connections are made within a network, the more powerful and capable that network becomes. This is because every new 'node' or user has the potential to connect to all the existing nodes to the network. The more users your product has, the more value it holds.

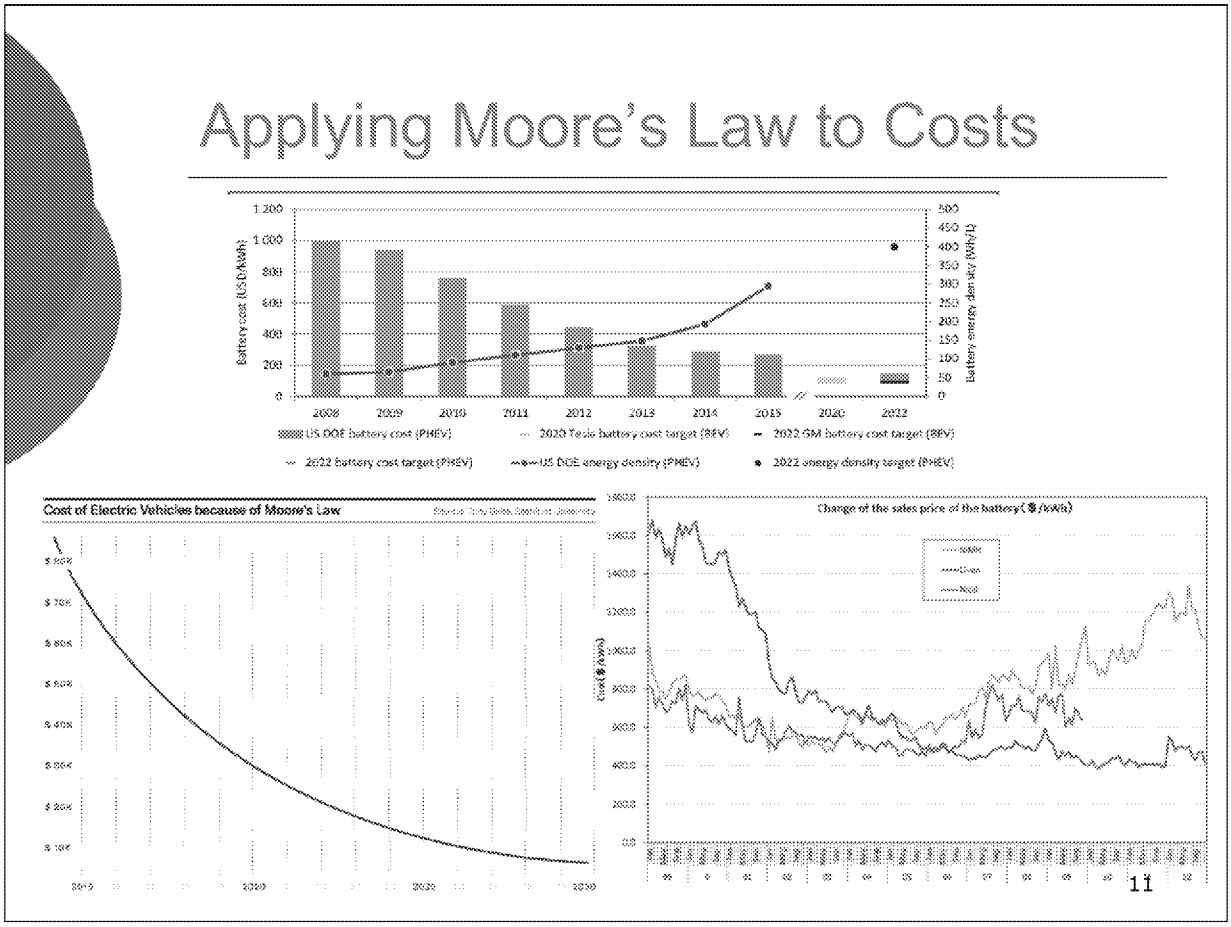


It's looking like the 2020s will be the decade of the electric car.
In the next few years, Tesla, Chevy, and Nissan plan to start selling long-range electric cars in the $30,000 range. Other carmakers and tech companies are investing billions on dozens of new models.
By 2020, some of these will cost less and perform better than their gasoline counterparts. The aim would be to match the success of Tesla's Model S, which now outsells its competitors in the large luxury class in the U.S.



A new study from Bloomberg New Energy Finance shows just how dramatically estimates are changing. The most radical swing comes from OPEC, an organization made up of leading oil producing nations, which boosted its forecast of electric-vehicle sales by 500 percent compared to last year.

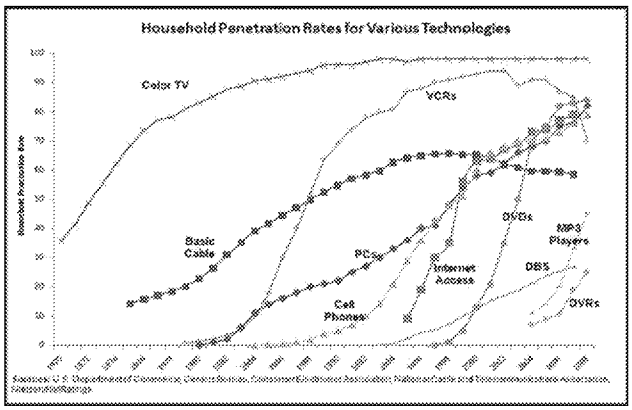
The International Energy Agency has more than doubled its estimate about global electric-vehicle sales. Meanwhile, Exxon, BP and Statoil are all now expecting at least 100 million electric vehicles to hit the roads worldwide between 2030 and 2035.

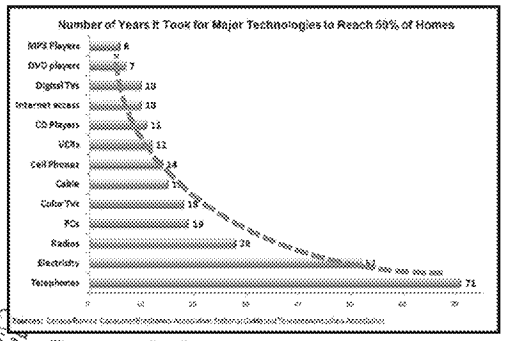


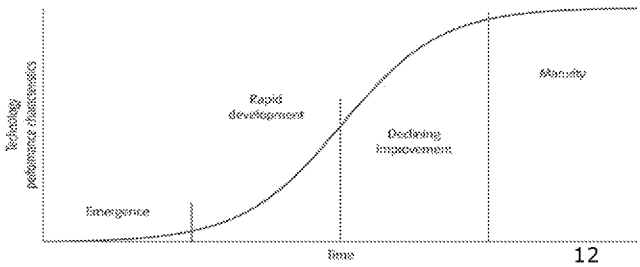
Analysts say a twelvefold increase in battery capacity will be necessary by 2025.
Although Moore's law had been coined initially for the development and growth of chip technology, the concept can be extracted and applied to parallel technologies fairly simply; those where consistent innovation is involved.
What does this mean for EV batteries?
In this demonstration, Stanford Academics stated that when the demand for battery power increased, the improvement of the technology simultaneously increased: overall, the general improvement rate has been recorded at approximately 16% growth per year, and is apparently still accelerating.
The Power Law occurs when you combine Moore's Law and Metcalfe's Law. In other words, the value of the best outcome exceeds all other outcomes combined; the second best outcome exceeds the value of subsequent outcomes and so-on. This is what we are witnessing with Tesla and updated forecasts for EV's

Historical Times for Tech Adoption

- Average time for a technology to reach 50% of market penetration following the first 1% of deployment (about where EVs are now) has been 21yrs; with more recent technologies, is it 8yrs
- More recent technologies result in faster penetration







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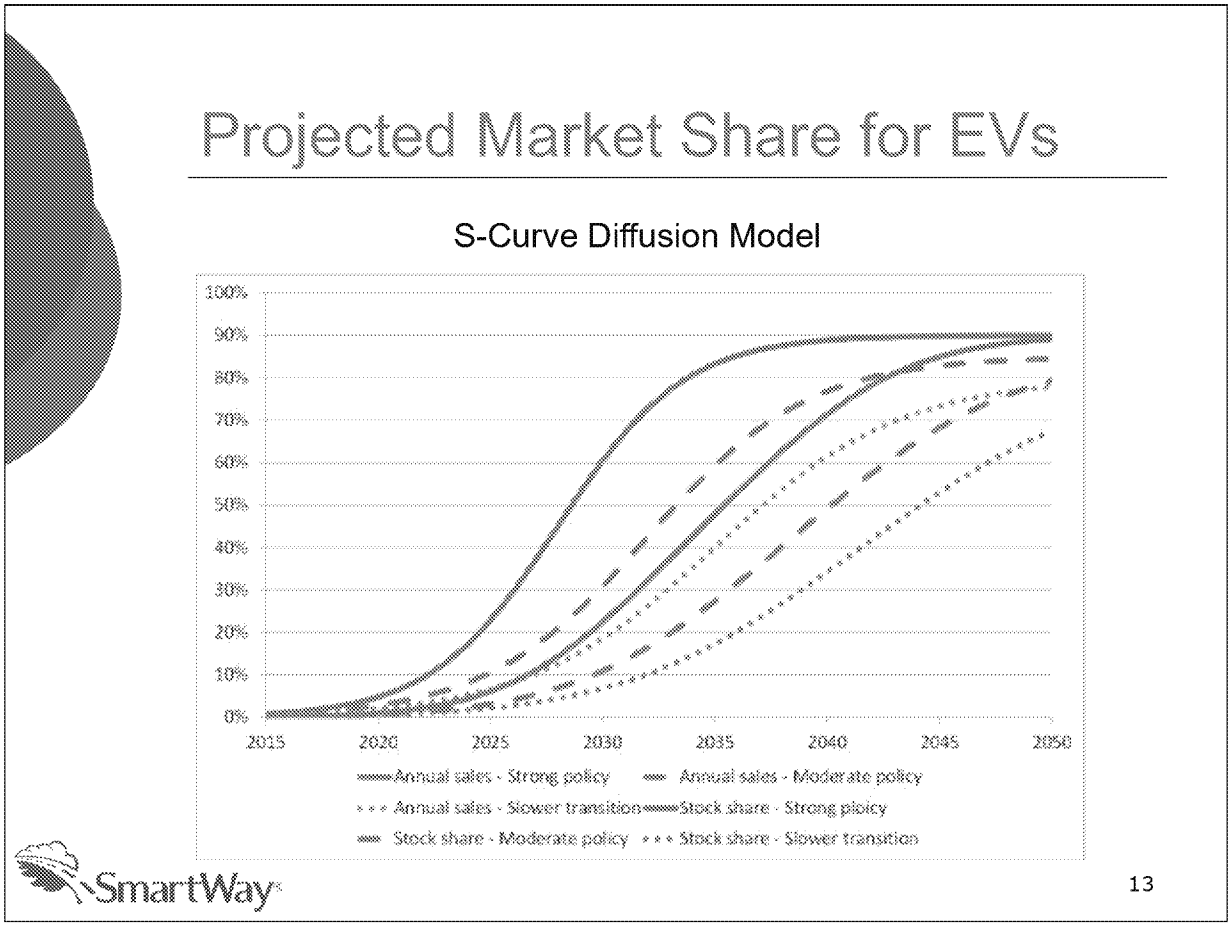
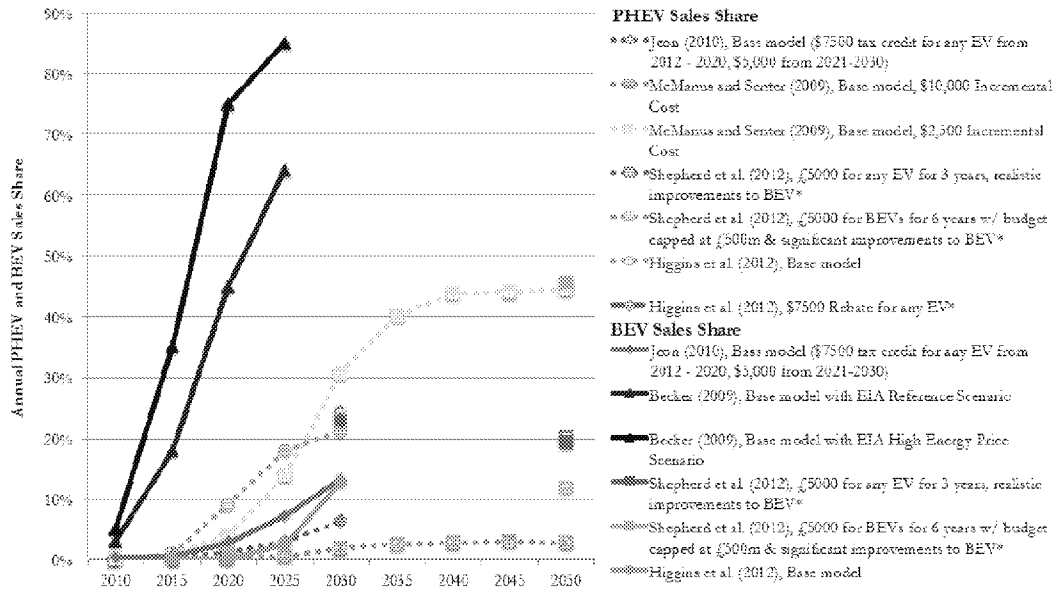
Unlike many of the technologies detailed which fulfill a new function, electric vehicles are a replacement to an existing technology.
However, replacement technologies are still capable of gaining a large market share quickly. The digital camera replaced film over a period of around 20 years and DVD's replaced VCR's over a period of around 10 years.
In these examples, the replacement technology brought clear, perceptible advantages that their predecessors did not.
In the case of electric vehicles, the advantages are not quite as perceptible. The function and operation of the vehicle remains very similar while the additional benefits of reduced environmental degradation are shared by all, resulting in free-riders which dampen the rate of market adoption for EVs.
The microeconomic market characteristics for electric vehicles are also different than other replacement technologies in that there exists a large capital stock which is costly to replace – a new car is more expensive than a new DVD player.
This in turn limits the rate of change in the capital stock.
Below you can see a depiction of what a traditional diffusion model, following an S-Curve would look like. We move from emergence, to rapid development, which could begin in 2022 with parity of vehicle purchase price, to declining improvement and ending with maturity.



Three different scenarios were assessed representing strong policy drivers, more moderate policy drivers and a delayed transition representing weak policy and economic/technical obstacles.
The strong policy scenario is supported by a reconciliation with historical data and assumes that financial incentives such as tax rebates increase over time; there is increased investment through government subsidies to support charging infrastructure and grid connectivity; and most importantly that fuel prices increase, placing a high premium for gasoline to dis-incentivize future sales of combustion vehicles.
The moderate policy scenario maintains the same policy assumptions as the strong scenario, but also assumes that consumer information regarding the policy mechanisms is delayed from reaching the consumer due to a lack of policy supporting consumer awareness along with a decrease in financial subsidies.
Finally, the delayed transition scenario assumes that current financial incentives are reduced and eliminated, resulting in an infrastructure gap for certain regional areas where charging stations are unavailable, creating "charging deserts" where combustion vehicles are still necessary.
Based on this simplified model, annual sales of electric vehicles may constitute 20-60% of total light duty vehicle sales by 2030, accounting for 7-22% of total vehicle stock.
By 2050, all scenarios demonstrate sales of 80% or greater, resulting in a minimum of 67% of total vehicle stock.
Bloomberg projects EV's becoming economically competitive in 2022, with variance between different geographies dependent on factors such as weather, driving patterns, and fuel prices.
Looking at the various policy scenarios, the early 2020's mark the point of rapidly increasing market share.

Momentum in the EV industry is surging. In 2016, U.S. EV sales jumped 37%, and that pace has continued in 2017 as EV sales are up 44.7% through May, including a 91% increase in California.

Additional Diffusion Models



*Shepherd et al. (2012) presents sales shares for years 2020 and 2050 while Higgins et al. (2012) only displays year 2030.

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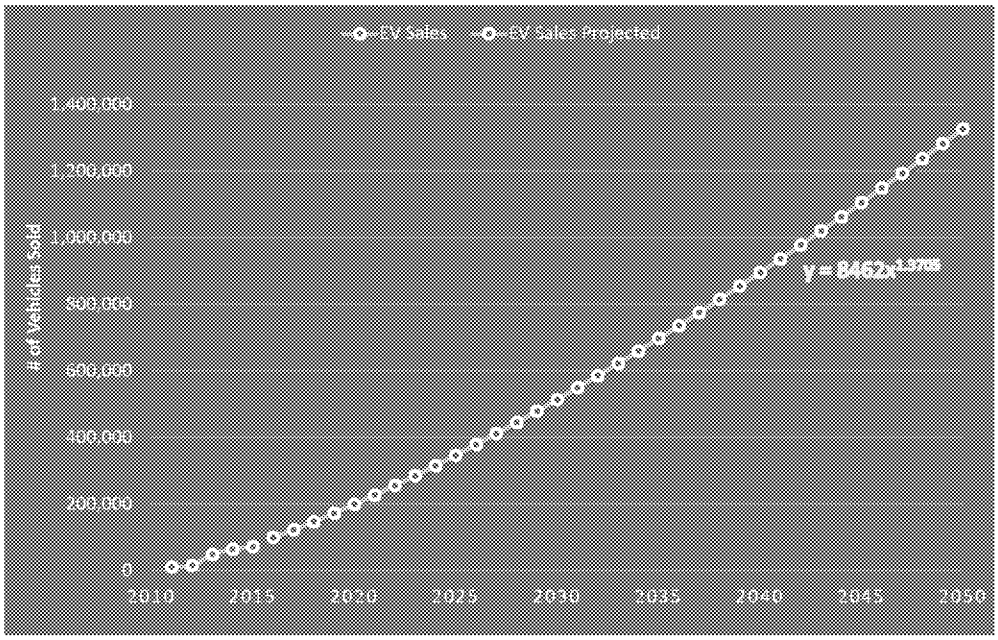
Higgens + Becker show beginning of s-curve both seeming to reach the inflection point as we move from increasing to declining improvement of EV technology

EIA scenarios (outliers) demonstrate the overt impact fuel prices have an adoption. This may have seem accurate at the time of modeling (2010) when fuel prices were much higher than they are now and these modelers probably didn't anticipate the substantial drop we see today. Unfortunately for EV's and other fuel saving technologies, adoption is highly correlated with fuel prices.

Jeon et al, using high subsidies, resulted in lower penetration than Becker which considered the impact of fuel prices on EV adoption.

Electric Vehicle Sales and Projections



Conservative Back-of-the-Envelope (baseline): 30% market share by 2050

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Ceterus Peribus: 2010-2015 data set projected out

Policy Mechanisms to Support EV Adoption

- Offer tax incentives or other subsidies for consumers
- Create carbon credits for OEM's that can be banked and/or traded
- Invest in infrastructure development, including rapid charging stations nationwide
- License/vehicle registration fee reduction
- Free parking and high occupancy vehicle (HOV) lanes
- Raise awareness and increase consumer confidence

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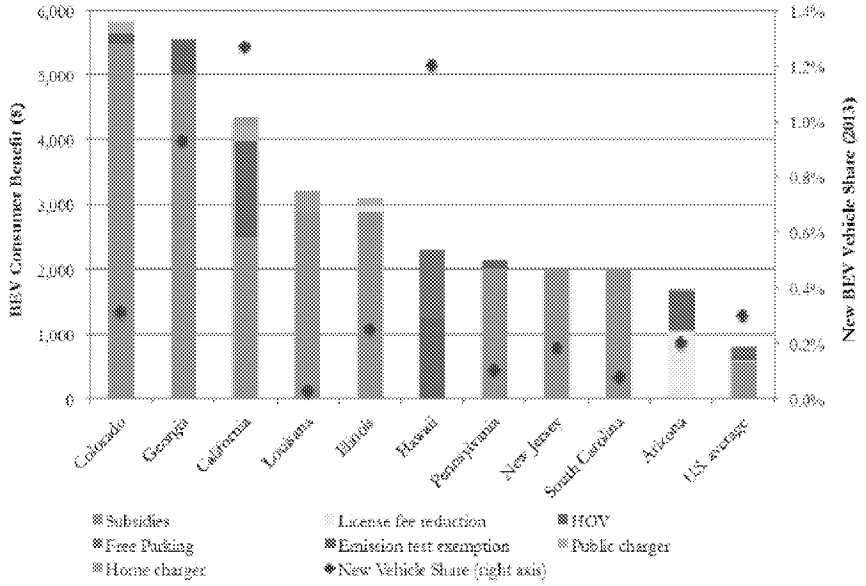
The government can help support the adoption of electric vehicles by providing incentives such as subsidies or rebates to help lower the cost of vehicle ownership for consumers.
The government can also allow for the banking and trading of credits to original equipment manufacturers (OEMs), creating market mechanisms where OEM's are able to monetize the benefits of reduced emissions and energy intensity of vehicles.
Unfortunately, the literature surrounding financial incentives is somewhat inconclusive and highly contingent on fuel prices.
One study found that subsidies are benefiting consumers within higher socioeconomic levels who are likely to make the purchase regardless of any financial incentives.
For these individuals, the perceived benefit of driving an electric vehicle is embedded in being an environmental conscious person and are therefore less subjective to relying on financial incentives in making their purchase. However, for individuals of lower economic levels, financial incentive assist in overcoming cost barriers and are still the primary factor in purchasing an electric vehicle.

EV Consumer Benefit and Market Share by State



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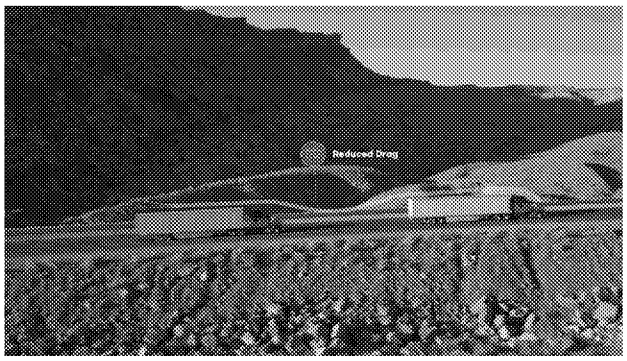
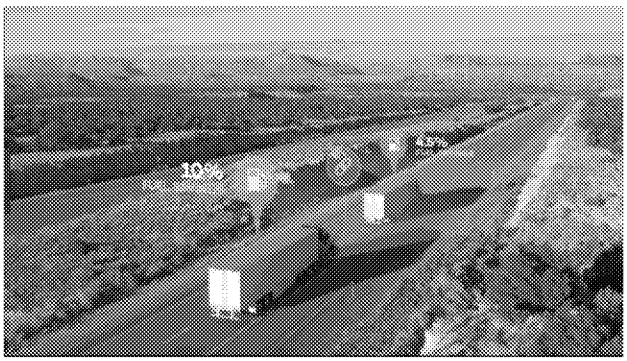
These results indicate that the most valuable state incentives are direct subsidies to reduce the overall cost of purchasing an electric vehicle.
Access to HOV lanes was also a notable driver for EV market share, being the second largest incentive in most states.
Colorado ranks the highest in consumer benefits, primarily due to its up to $6,000 income tax credit for EVs in 2014, yet there is little difference in Colorado's share of new EV vehicles in comparison to the U.S. average.
Hawaii is found to rank sixth in regards to EV incentives, where they are valued at about $1,200 for HOV lane access and about $1,000 for free parking at metered stalls (for BEVs).
Other incentives such as access to free parking, license fee reductions and public charging also led to increases in market adoption, although the heterogeneity of different states can explain the uneven distribution of various incentives.
The challenge for policy makers is determining the appropriate and pareto optimal mix of different incentives, maximizing market adoption while minimizing costs both for consumers and the government.
Equally important, one must distinguish between increasing consumer education on the benefits of driving and owning an EV from the asymmetric information gaps of available incentives.

Driver Assisted Truck Platooning

Peloton Platooning System





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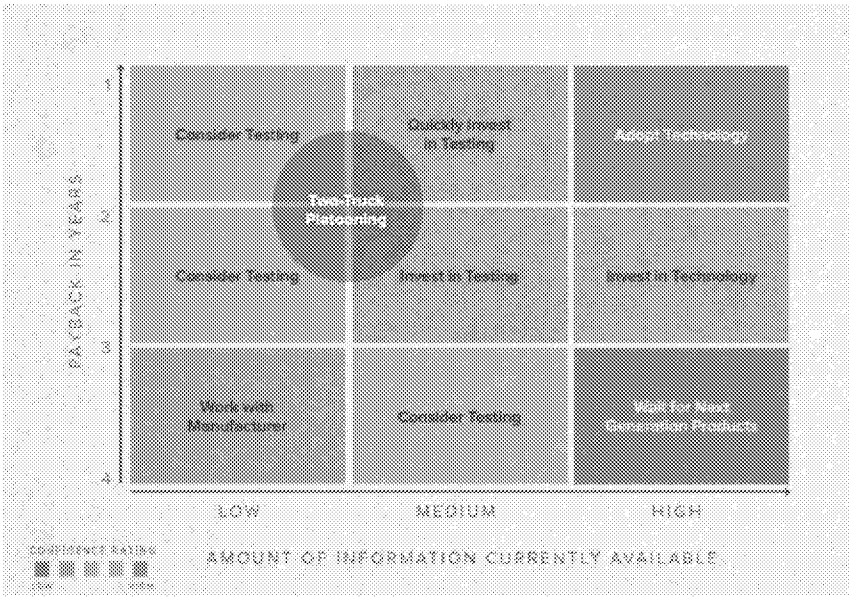
18

Connecting Braking and Acceleration: Peloton's truck platooning system uses Vehicle to Vehicle (V2V) communication to connect the braking and acceleration between the two trucks. The V2V link allows the lead truck to control the acceleration and braking of both trucks virtually simultaneously, reacting faster than a human or even radar sensors could.
Aerodynamic Benefits: The reduction in aerodynamic drag of two-truck platoons provides fuel savings for both the trailing and the leading truck. Independent fuel efficiency testing by a major fleet, NACFE, and the U.S. Departments of
Energy and Transportation has shown double digit fuel savings. The aerodynamic improvement allows the front truck to save fuel along with the rear truck.
Safety: During manual driving, safe following distances between trucks are maximized to allow time for driver perception, reaction, and brake lag in both trucks when responding to an obstacle ahead. The Peloton system is designed to support the capabilities of the driver by reacting more quickly, more accurately, and more reliably, than a driver normally can.

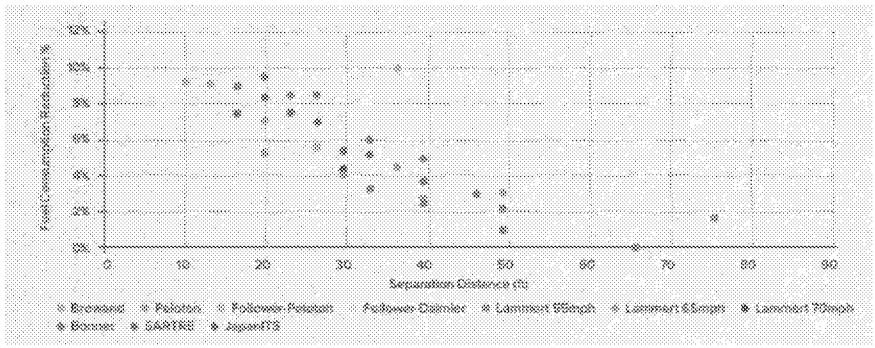
Confidence Matrix: Two Truck Platooning

Commercial Trucking's Future?



SmartWay

Paving the Way to Lower Fuel Consumption



- The bulk of the required technology is currently available
- The real-world fuel savings of two truck platooning is likely to be a 4% average across the two trucks
- Intervals of 40 to 50 ft. will likely have sufficient payback for early adopting fleets
  - In general, the relationship between separation distance and fuel consumption reduction follows a decrease of 2% for every 10 foot interval
- Platooning will accelerate the adoption of other technologies such as collision avoidance and adaptive cruise control

SmartWay

Conclusion: Changes are coming and sooner than we expect..!

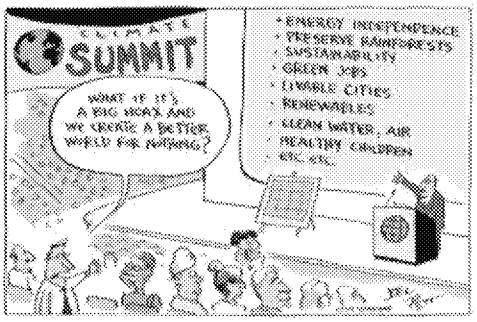
- Platooning is around the corner and can greatly enhance the efficiency of freight movements.
- Platooning can serve as a bridge technology for automated and safety enhancements.
- There are a wide range of available forecasts and assumptions for modeling EV adoption.
- Mobility markets are changing
- Messaging is important! Consumer confidence and acceptance can be improved through the successful demonstration of EV infrastructure projects.
- Increasing fuel taxes by 3% results in an increase in market share by **17.5%** compared to 9% for a doubling of financial incentives.

SmartWay

Chinese automakers are on track to produce 49 of the 103 new electric car models that will be launched globally by 2020, as part of China's push to accelerate the switch to battery power from oil, according to a new forecast released last Wednesday.
Mobility markets are changing: It's plausible that in the near future we could have fleet owned autonomous, electric, ride hail fleets operating in urban areas. Fleet vehicles will drive more miles and turn over faster, which could completely change the economics and timeframe for electric vehicle adoption.
Despite the news from Tesla and Volvo this week, as well as from France, which announced plans to phase out fossil-fuel-powered vehicles by 2040, consumer preferences could still get in the way of the electric vehicle boom.
Recent data has shown a decline over the last several years in terms of the total number of vehicle sales and leases. People are beginning to consolidate the number of vehicles they own and are willing to participate in ride-sharing programs.
when financial incentives are doubled, resulting market share increased by only 18% for hybrid electric vehicles, resulting in a return of investment of 9%. However, an increase of gas prices by 3% also resulted in the same outcome.

Current subsidies may run out: On the negative side, the $7,500 tax credit does have its limitations based on sales caps for manufacturing. Tesla is already approaching and is expected to exceed to cap with the model 3 sales and it will be interesting to see what happens.
However, while tax credits result in the largest portion of consumer benefit currently, gasoline costs can have a more substantial impact. If those costs remain low, it may become advantageous to increase the gas tax and potentially even the diesel tax to encourage more wide-spread adoption of LD and HD electrified vehicles.

Thank you!



SmartWay

Message

From: Corey, Richard@ARB [richard.corey@arb.ca.gov]
Sent: 1/7/2016 3:13:51 PM
To: Nichols, Mary D. @ARB [mary.nichols@arb.ca.gov]
Subject: FW: Volkswagen clips 1/6/2016: Reuters: Volkswagen likely to buy back 115,000 cars in U.S: German report

FYI

From: Grundler, Christopher [mailto:grundler.christopher@epa.gov]
Sent: Wednesday, January 06, 2016 5:28 PM
To: Corey, Richard@ARB
Subject: Fwd: Volkswagen clips 1/6/2016: Reuters: Volkswagen likely to buy back 115,000 cars in U.S: German report

Ex. 5 Deliberative Process (DP)

Christopher Grundler, Director
Office of Transportation and Air Quality
U.S. Environmental Protection Agency
202.564.1682 (Washington)
734.214.4207 (Ann Arbor)
www.epa.gov/otaq

Begin forwarded message:

From: "Valentine, Julia" <Valentine.Julia@epa.gov>
Date: January 6, 2016 at 8:18:14 PM EST
To: "Allen, Laura" <Allen.Laura@epa.gov>, "Mylan, Christopher" <Mylan.Christopher@epa.gov>, "Fogarty, Johnpc" <Fogarty.Johnpc@epa.gov>, "Conger, Nick" <Conger.Nick@epa.gov>, "Senn, John" <Senn.John@epa.gov>, "Millett, John" <Millett.John@epa.gov>, "Birgfeld, Erin" <Birgfeld.Erin@epa.gov>, "Hull, George" <Hull.George@epa.gov>, "Grantham, Nancy" <Grantham.Nancy@epa.gov>, "StClair, Christie" <StClair.Christie@epa.gov>, "Davis, Jay" <Davis.Jay@epa.gov>, "Cohen, Janet" <cohen.janet@epa.gov>, "Brooks, Phillip" <Brooks.Phillip@epa.gov>, "Hengst, Benjamin" <Hengst.Benjamin@epa.gov>, "Grundler, Christopher" <grundler.christopher@epa.gov>, "Purchia, Liz" <Purchia.Liz@epa.gov>, "Werner, Jacqueline" <Werner.Jacqueline@epa.gov>, "Belser, Evan" <Belser.Evan@epa.gov>, "Kaul, Meetu" <Kaul.Meetu@epa.gov>, "Cook, Leila" <cook.leila@epa.gov>, "Smith, Roxanne" <Smith.Roxanne@epa.gov>, "Orquina, Jessica" <Orquina.Jessica@epa.gov>, "Hart, Daniel" <Hart.Daniel@epa.gov>, "Bunker, Byron" <bunker.byron@epa.gov>, "Phillips, Anna" <Phillips.Anna@epa.gov>, "Giles-AA, Cynthia" <Giles-AA.Cynthia@epa.gov>, "Harrison, Melissa" <Harrison.Melissa@epa.gov>, "McCabe, Janet" <McCabe.Janet@epa.gov>, "Valentine, Julia" <Valentine.Julia@epa.gov>
Subject: Re: Volkswagen clips 1/6/2016: Reuters: Volkswagen likely to buy back 115,000 cars in U.S: German report

REGULATORY NEWS, BREAKINGVIEWS:
Volkswagen likely to buy back 115,000 cars in U.S: German report
Business News | Wed Jan 6, 2016 7:03pm EST
BERLIN
REUTERS/STEVE MARCUS

German automaker Volkswagen AG (VOWG_p.DE) assumes it will have to buy back about 115,000 cars in the United States as a result of the emissions scandal, a newspaper reported on Thursday.
Without citing its sources, Germany's daily Sueddeutsche Zeitung said the company expected it would have to either refund the purchase price of a fifth of the diesel vehicles affected or offer a new car at a significant discount.
Volkswagen expects that the rest of the vehicles will need major refits, incurring significant costs for parts and a long stay at the garage as parts of the exhaust must be reconstructed and approved, the newspaper reported.
ADVERTISING

Volkswagen could not be immediately reached for comment.
On Tuesday, VW brand chief Herbert Diess said he was confident the German automaker would reach agreement with U.S regulators to bring nearly 500,000 diesel vehicles into compliance with U.S. emissions laws.
In an interview with Reuters, Diess said fixing older VW cars equipped with 2.0-litre diesel engines would be more difficult than bringing more recent models into compliance.
Some U.S. regulators and lawmakers have said VW may have to buy back older models. Diess did not say whether VW was discussing that, but said he was optimistic an agreement with U.S. regulators would be reached soon.
The U.S. Environmental Protection Agency said on Wednesday that "recall discussions with the company have not produced an acceptable way forward. EPA continues to insist that VW develops effective, appropriate remedies as expeditiously as possible."
The U.S. Justice Department on Monday sued Volkswagen for up to $48 billion for allegedly violating U.S. environmental laws.
The Sueddeutsche Zeitung also reported that about 50 employees - including several division heads - had come forward as part of an internal amnesty program to help the company clear up the scandal.
Volkswagen has admitted it installed software in certain diesel models sold in the United States, that allowed the cars to pass government emissions tests, but then emit nearly 40 times the allowed levels of pollutants on the road.
Diess said Volkswagen expected the company would be able to repair by the end of 2016 about 8.5 million diesel cars sold in Europe that did not comply with emissions standards.
(Reporting by Emma Thomasson; Editing by Alison Williams)

Volkswagen brand chief confident of finding solution

Reuters 1/6/2016, 10:41 AM

Reporting by Joe White in Detroit; Editing by Sunil Nair and Muralikumar Anantharaman

The head of Volkswagen AG's (VOWG_p.DE) top-selling brand said on Tuesday he is confident the German automaker will reach agreement with U.S regulators to bring nearly 500,000 diesel vehicles into compliance with U.S. emissions laws.

"We are confident we will find an acceptable solution," VW brand chief Herbert Diess said at a press conference at the Consumer Electronics Show in Las Vegas, Nevada.

In an interview with Reuters, Diess said fixing older VW cars equipped with 2.0-liter diesel engines will be more difficult than bringing more recent models into compliance.

"The intrusion into the car will be quite significant," Diess said of the older models. Some U.S. regulators and lawmakers have said VW may have to buy back older models. Diess didn't say whether VW is discussing that, but said he is optimistic an agreement with U.S. regulators will be reached soon.

"It's a very constructive dialogue," he said.

Diesel technology will still play an important role in VW's future product strategy, Diess said. "Diesel still has a future in some segments," including in sport utility vehicles, "and in some markets it will be a must," he said. Europe will still be a major diesel market in the next decade, Diess said.

Volkswagen has admitted it installed software in certain diesel models sold in the United States, that allowed the cars to pass government emissions tests, but then emit nearly 40 times the allowed levels of pollutants on the road.

The U.S. Justice Department on Monday sued Volkswagen for up to $48 billion for allegedly violating U.S. environmental laws.

Diess said Volkswagen expects the company will be able to repair by the end of 2016 about 8.5 million diesel cars sold in Europe that don't comply with emissions standards.

Separately, Diess announced a new partnership with Mobileye, the Israeli machine vision company that is a leader in camera technology used in advanced safety features such as automatic braking or lane departure warning.

VW and Mobileye signed on Tuesday an agreement under which Mobileye's camera systems will beef up the mapping systems VW cars will use to enable autonomous driving, Diess said.

"We always have to look at partnerships," Diess told Reuters. "This world is changing so much faster than our traditional world" of automotive suppliers.

Diess showed off VW's concept for an electric, highly connected microbus, called the Budd-e, which he said could be brought to market by 2020.

12:44 PM

Please see update to AP story (highlighted):

VW Exec Sees US Fixes Soon in Emissions Test Cheating

- By tom krisher, ap auto writer

LAS VEGAS — Jan 6, 2016, 11:57 AM ET

The top executive of the Volkswagen brand worldwide says he's optimistic that U.S. environmental regulators will approve fixes within the coming weeks or months for diesel engines that cheat on emissions tests.

Brand CEO Herbert Diess said Tuesday night at the CES gadget show in Las Vegas that the company is having constructive discussions with the U.S. Environmental Protection Agency and the California Air Resources Board.

But the EPA didn't sound as optimistic, issuing a statement Wednesday saying that talks with VW so far "have not produced an acceptable way forward."

Diess says VW already has received approval to fix 8.5 million cheating cars in Europe. Repairs will start this month and most will be fixed this year.

But the U.S. cars are more problematic because they emit up to 40 times more toxic nitrogen oxide than allowed. Nearly 600,000 cars are affected in the U.S., with a total of 11 million worldwide. Diess spoke as the company unveiled a concept of an electric-powered Microbus that could go into production in 2019.

U.S. fixes likely will include complicated recalls and take several years for some of the older models. VW has admitted cheating by installing software that turns emissions controls on during government tests and turns them off on real roads.

Diess apologized for the scandal. "I'm optimistic that we will find a solution, we will bring a package together which satisfies our customers first and foremost and then also the regulators," he said.

But the EPA statement said it and CARB will keep insisting that VW come up with "effective appropriate remedies as expeditiously as possible at no cost to owners."

The U.S. Justice Department has sued Volkswagen over emissions-cheating software, potentially exposing the company to more than $20 billion in fines for violations of the federal Clean Air Act. VW could also rack up additional significant civil penalties based on the specific facts determined at trial.

The company and its executives could still face separate criminal charges, while a raft of private class-action lawsuits filed by angry VW owners are pending.

The company first acknowledged in September that the cheating software was included in its diesel cars and SUVs sold since the 2009 model year, as well as some recent diesel models sold by the VW-owned Audi and Porsche brands.

Associated Press reporter Michael Biesecker contributed from Washington.

1/6, 7:53 AM

AP
http://hosted.ap.org/dynamic/stories/U/US_VOLKSWAGEN_EMISSIONS?SITE=AP&SECTION=HOME&TEMPLATE=DEFAULT

VW EXEC SEES US FIXES SOON IN EMISSIONS TEST CHEATING

BY TOM KRISHER, AP AUTO WRITER

Jan 6, 3:43 AM EST

LAS VEGAS (AP) -- The top executive of the Volkswagen brand worldwide says he's optimistic that U.S. environmental regulators will approve fixes within the coming weeks or months for diesel engines that cheat on emissions tests.

Brand CEO Herbert Diess said Tuesday night at the CES gadget show in Las Vegas that the company is having constructive discussions with the U.S. Environmental Protection Agency and the California Air Resources Board.

Diess says VW already has received approval to fix 8.5 million cheating cars in Europe. Repairs will start this month and most will be fixed this year.

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U.S. fixes could be complicated and take several years. VW has admitted cheating on about 500,000 diesel cars nationwide by installing software that turns emissions controls on during government tests and turns them off on real roads.

Diess apologized for the scandal. "I'm optimistic that we will find a solution, we will bring a package together which satisfies our customers first and foremost and then also the regulators," he said.

The U.S. Justice Department sued Volkswagen on Monday over emissions-cheating software, potentially exposing the company to billions of dollars in penalties for clean air violations.

The company is in the midst of negotiating a massive mandatory recall with U.S. regulators and potentially faces more than $18 billion in fines for violations of the federal Clean Air Act.

The company and its executives could also still face separate criminal charges, while a raft of private class-action lawsuits filed by angry VW owners are pending.

The company first acknowledged in September that the cheating software was included in its diesel cars and SUVs sold since the 2009 model year, as well as some recent diesel models sold by the VW-owned Audi and Porsche brands.

Julia P. Valentine
Sent from USEPA iPhone

On Jan 6, 2016, at 7:42 AM, Valentine, Julia <Valentine.Julia@epa.gov> wrote:

https://global.handelsblatt.com/edition/340/ressort/companies-markets/article/vw-vows-to-change?ref=MTI5ODU1

DIESELGATE SCANDAL

In Las Vegas VW Gambles on a Rebrand

BY HANDELSBLATT STAFF

Volkswagen brand chief executive Herbert Diess was at pains to present a "new Volkswagen" at the Las Vegas Consumer Electronics Show this week. But his rebranding attempt was overshadowed by the ongoing lawsuit into falsified emissions tests and December's plummiting U.S. car sales figures.

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If you're chosen to give the opening speech at the Las Vegas Consumer Electronics Show, you're part of a very select group of people. VW spent months of networking to ensure that one of its executives got that honor, according to sources at the company.

Last summer, Martin Winterkorn, the then chief executive, finally got the OK to enter the date in his diary. By September, the diesel scandal had cost him his job, but that didn't matter. The VW speech would go on.

One might think that Mr. Winterkorn's successor, Matthias Müller, would step up to the lectern himself. Instead he chose to send the head of the core VW brand, Herbert Diess. Until half a year ago, Mr. Winterkorn held both positions — that of chief executive of the VW group and head of the VW brand.

The decision that Mr. Diess should hold the speech on VW's electric car strategy shows the new division of labor at the top of VW, with Mr. Müller in charge of overall group strategy and Mr. Diess responsible for rebuilding the VW brand's sorely tarnished presence in the the United States.

Mr. Diess, a 57-year old executive who joined VW from BWM in July, started his speech by apologizing for the diesel emissions scandal. With illegal software in around 11 million cars, of which almost 600,000 were sold in the United States, VW lowered nitrogen oxide emissions during testing.

On the road, the VW, Audi, Porsche and Škoda cars emitted much higher volumes of nitrogen oxide, highly toxic pollutants which play a key role in creating smog.

"The current issue with the diesel engines is certainly nothing to be proud of. We disappointed our customers and the American people for which I am truly, truly sorry and for which I apologize," Mr. Diess told the Las Vegas conference.

In Europe, VW had already presented plans to fix 8.5 million affected cars, but the carmaker was still working on a recall plan in the United States. "Here in the United States the set of regulations is different compared to Europe: it's more demanding in terms of nitrogen oxide and less demanding in terms of CO2. We are working hard to present an acceptable package to the U.S. authorities," Mr. Diess said.

The VW executive said he was "confident" the carmaker would "find good solutions for the affected U.S. vehicles and our valued customers" and that he was optimistic Volkswagen would win approval for a recall and repair plan "within the coming weeks and months."

In his presentation, Mr. Diess did not address Monday's lawsuit filed by the U.S. Department of Justice, nor did he allude to a 9.1 percent drop of VW brand car sales in the United States in December.

The U.S. Justice Department filed a civil lawsuit against VW on Monday and the complaint, filed in a federal court in Detroit on behalf of the U.S. Environmental Protection Agency, alleges that Europe's largest automaker knowingly installed so-called defeat devices in almost 600,000 of its diesel cars in the United States.

In its 30-page complaint, the Justice Department said the charges carry fines of between $2,750 and $37,500 per car, per violation. Based on four separate violations laid out in the complaint, VW could theoretically face as much as $48 billion in penalties, according to Reuters calculations, which is higher than the $18 billion estimated when the scandal broke in September.

"It's a common tactic in U.S. lawsuits to present immensely high demands," said Carsten Albrecht, a business lawyer at the FPS law firm in Hamburg. "The actual compensation usually ends up much smaller."

But the news, which sent Volkswagen preference shares tumbling to a 6-week low on Tuesday, will inevitably cast a big shadow on Mr. Müller's trip to Detroit this weekend for the first big auto show of the year — at the traditional eve-of-show beer and burgers dinner in Fishbones Restaurant, where the VW chief usually just says a few words to the invited guests, and on Monday when VW will present new models including a hybrid sports utility vehicle aimed at regaining the trust of U.S. customers.

Mr. Diess presented two electric VW cars, the E-Golf Touch and the Bulli Budd-e, which are part of "a new Volkswagen".

"When I look few years into he future I see a car that is all electric, has zero emission, mitigates virtually all accidents, is smarter than anything we can imagine today and is also incredibly comfortable," Mr. Diess said.

Volkswagen, a conglomerate based in Wolfsburg with 12 different brands, has lagged its bigger rival Toyota in developing hybrid cars, Tesla in producing all-electric vehicles, and Google in testing self-driving cars.

Mr. Diess said his company was dedicated to change. "The new Volkswagen stands for affordable electric mobility, the new Volkswagen stands for fully connected vehicles, the new Volkswagen stands for automated driving," he said.

When Mr. Diess' boss visits Detroit in a few days time, VW will finally show off SUV cars that U.S. drivers really want. The European carmaker has long struggled to build a large market share in the United States as its cars did not meet many of the U.S. customers tastes.

But the scandal will dog Mr. Müller wherever he goes. VW may have found solutions for refitting and repairing the more than 8.5 million cars affected in Europe, but that's irrelevant in the United States. The company has until Jan. 14 to present a solution for the more than 480,000 2.0-liter engines fitted with the fraudulent software. It must present a further recall plan for 85,000 3.0-liter engine cars by the beginning of February.

Mr. Müller will hold political talks from Tuesday of next week, sources at VW said. They did not say who he will meet.

Just before Christmas, Mr. Müller likened the relationship between VW and the U.S. authorities to that of an old married couple that had got on well for a long time but was going through a rough patch. It looks as if the reconciliation will take some time.

The lawsuit dashed any hopes of lenient treatment for VW. Its wording heralds a tough legal battle, and an uncertain outcome.

Japanese rival Toyota faced demands totalling $58 billion for similar environmental transgressions, but escaped with a fine of just $34 million in 2003. But unlike VW, Toyota did not deliberately cheat.

Experts say VW must brace itself for the highest environmental fine ever imposed on an automaker in the United States. On top of that it faces numerous civil compensation claims from car owners and criminal fines.

Dutch banking group ING expects total fines of $13 billion. VW declined to comment on the possible extent of penalties. A company spokesman said VW will continue to cooperate with the authorities. It doesn't have much choice.

U.S. rules on diesel emissions are far stricter than in Europe. According to the latest U.S. standard, BIN 5, the most modern diesel cars must emit no more than 31 milligrams of nitrogen oxide per kilometer, the same level as gasoline-powered vehicles. Manufacturers must guarantee this level for five years or 80,000 kilometers. After that, 44 milligrams are permitted.

The new U.S. rules mark a radical cut from the BIN 10 standard which applied until 2009 and permitted emissions of 375 milligrams, more than 10 times the current limit. The message to manufacturers was clear: either get diesel emissions down to gasoline levels or stop selling diesel cars in the U.S.

That was a shock for European diesel auto manufacturers. The European Union also tightened its emissions rules but it was far more lenient and currently allows 80 milligrams of nitrogen oxide emissions per kilometer.

Diesel remains highly popular in Europe where it's seen as cost-efficient, robust and durable. The U.S. tests are also far tougher than those in Europe. In Europe, diesel vehicles are required to drive 1,180 seconds with an average speed of 33.6 kilometers per hour for a distance of 10,966 meters.

In the United States, it's 1, 877 seconds with 34.1 kilometers per hour for a distance of 17,770 meters. The U.S. test is regarded as slightly more realistic due to the slightly higher speed.

From 2017 there will be a global standard callee WLTC: 1,800 seconds, 46.5 kilometers per hour and a distance of 23,274 meters. That will be closer to reality.

Markus Fasse covers the aviation and automobile industry. Thomas Jahn is Handelsblatt's New York correspondent since 2011. Christian Schnell is an editor with Handelsblatt, covering the stock market and German auto industry. To contact the authors: fasse@handelsblatt.com, jahn@handelsblatt.com and schnell@handelsblatt.com

Julia P. Valentine
Sent from USEPA iPhone

On Jan 6, 2016, at 12:51 AM, Valentine, Julia <Valentine.Julia@epa.gov> wrote:

Note Guardian headline below:

http://www.theguardian.com/technology/2016/jan/06/vw-close-to-agreement-with-us-regulators-over-emissions-scandal

VW 'close to agreement with US regulators' over emissions scandal

Vehicle manufacturer negotiating how to recall half a million diesel cars in US after episode which 'disappointed the American people', top executive says

Nellie Bowles and Danny Yadron in Las Vegas

Wednesday 6 January 2016 00.24 ESTLast modified on Wednesday 6 January 201600.28 EST

A senior Volkswagen executive has apologised to German consumers and said that the German car maker is close to reaching an agreement with US regulators on how it will recall some half a million cars that have illegally exceeded emissions targets for years.

Dr Herbert Diess, Volkswagen's chief executive of passenger vehicles, told a packed audience at the Consumer Electronics Show in Las Vegas the company was "focused on ensuring something like this can never happen again".

"We disappointed our customers and the American people," he said, adding the incident "is certainly nothing to be proud of".

It is the first public appearance by a VW executive in the US since the public hearing in which the company admitted to Congressthat, for seven years, it had deliberately falsified the emission readings of 11m vehicles worldwide.

Diess said the company has reached an agreement with European regulators to update software on VW cars across the continent. "Most of them will be fixed in 2016," he said. Left unsettled is what advice to give half a million American VW owners still running vehicles that produce emissions that are as much as 40 times over the legal limit.

On Jan 5, 2016, at 2:20 PM, Allen, Laura <Allen.Laura@epa.gov> wrote:

Be sure to read the politico story below.

Clips #6 "Summary of Day Two"

Included: Reuters (updated), Politico, WSJ, Automotive News, AP Wire/Yahoo

VW faces billions in fines as U.S. sues for environmental violations

Online: http://uk.reuters.com/article/us-volkswagen-usa-idUKKBN0UI1QP20160105

BY JULIA EDWARDS AND GEORGINA PRODHAN, Reuters
1/5/16 - 8:00 am

The U.S. Justice Department has sued Volkswagen for up to $48 billion for allegedly violating environmental laws - a reminder of the carmaker's problems nearly four months after its emissions scandal broke.
Although such U.S. lawsuits are typically settled at a fraction of the theoretical maximum penalty, analysts said the size of the claim meant Volkswagen (VW) could face a larger bill than previously anticipated.
"The announcement serves as a reminder/reality check of VW's still unresolved emissions issues," Goldman Sachs analysts wrote in a note, maintaining their "sell" recommendation on the stock.
VW (VOWG_p.DE) shares fell as much as 6 percent to a six-week low in early Tuesday trade, the biggest drop on Germany's blue-chip DAX index.
The civil lawsuit, announced on Monday, reflects the growing number of allegations against VW since the German company admitted in September to installing devices to cheat emissions tests in several 2.0 liter diesel vehicle models.
According to a Reuters review of the U.S. complaint, VW could in theory face fines of as much as $37,500 per vehicle for each of two violations of the law; up to $3,750 per "defeat device"; and another $37,500 for each day of violation.

The complaint says illegal devices to impair emission control systems were installed in nearly 600,000 vehicles in the United States. (here)
In September, U.S. regulators initially said Europe's biggest carmaker could face fines in excess of $18 billion.
The lawsuit had been expected, and analysts believe any fine will be far below the theoretical maximum. Although U.S. authorities sued Toyota for up to $58 billion for environmental violations around the turn of the century, they agreed a settlement that cost the Japanese carmaker about $34 million.
Equinet analyst Holger Schmidt cut his rating on VW shares to "reduce" from "neutral".
"We continue to believe that no one is able to make anything else than a wild guess on potential fines," he said.
During December, VW's shares had been recovering as the carmaker announced incrementally positive news such as simple fixes for about 8.5 million affected cars in Europe.
The stock is now 22 percent below pre-scandal levels, with analysts particularly concerned about the impact on VW in the United States, where the firm has long struggled to make inroads and tougher regulations mean it faces bigger potential fines.
The lawsuit, filed on behalf of the U.S. Environmental Protection Agency (EPA), accuses VW of four counts of violating the U.S. Clean Air Act, including tampering with the emissions control system and failing to report violations.
"The United States will pursue all appropriate remedies against Volkswagen to redress the violations of our nation's clean air laws," said Assistant Attorney General John Cruden, head of the Justice Department's environment and natural resources division.
The lawsuit is being filed in the Eastern District of Michigan and then transferred to northern California, where class-action lawsuits against VW are pending.
"We're alleging that they knew what they were doing, they intentionally violated the law and that the consequences were significant to health," said a senior Justice Department official.
VW's cheating of diesel emissions tests allowed it to avoid a costly revamp of engines to meet new U.S. standards.
The Justice Department has also been investigating criminal fraud allegations against VW for misleading U.S. consumers and regulators. Criminal charges would require a higher burden of proof than the civil lawsuit.
The U.S. lawsuit also alleges VW gamed emissions controls in many of its 3.0 liter diesel models, including the Audi Q7, and the Porsche Cayenne.
VW's earlier admissions eliminate almost any possibility that the automaker could defend itself in court, Daniel Riesel of Sive, Paget & Riesel P.C, who defends companies accused of environmental crimes, said.
To win the civil case, the government does not need to prove the degree of intentional deception at VW – just that the cheating occurred, Riesel said. "I don't think there is any defense in a civil suit," he said.
Instead, the automaker will seek to negotiate a lower penalty by arguing that the maximum would be "crippling to the company and lead to massive layoffs", Riesel said.
Even after VW first admitted to using cheat devices in certain models, the automaker "failed to come forward and reveal" that other vehicles contained such devices, the government said.
To cheat the emissions controls, VW installed software that allowed the vehicles to detect when they were being tested on a flatbed. When the vehicles detected they were actually on the road, the software caused the emissions control systems to underperform or shutdown, the government said, allowing the cars to emit dangerous levels of air pollution.
The civil lawsuit does not preclude the Justice Department from pursuing criminal charges against VW, said the Justice Department official.
VW said in a statement: "Volkswagen will continue to work cooperatively with the EPA on developing remedies."
"We will continue to cooperate with all government agencies investigating these matters."
(This story corrects the maximum penalty from $90 billion to $48 billion in the first paragraph, and the terms of the penalties in the sixth paragraph)

Politico

EPA, DOJ civil suit could amp up Volkswagen's monetary pain

By Lauren Gardner

To view online:
https://www.politicopro.com/transportation/story/2016/01/epa-doj-civil-suit-could-amp-up-volkswagens-monetary-pain-086300

01/04/2016 07:33 PM EDT
Updated 01/04/2016 08:52 PM EDT

The EPA and Justice Department on Monday made sure Volkswagen knows they are serious about making the carmaker pay for its diesel emissions cheating scandal, filing a civil suit that could cost VW tens of billions of dollars.

The four counts under the Clean Air Act put the potential maximum penalty well above the $18 billion the EPA initially floated in September as the scandal broke.

The agencies allege that nearly 600,000 diesel-fueled vehicles were equipped with illegal devices that override emissions controls during normal driving conditions, causing the cars and SUVs to emit anywhere from nine to 40 times the legal limit of nitrogen oxide pollution, and that Volkswagen sold the vehicles despite their lack of proper certification. The federal government's complaint includes the 2-liter diesels that were the initial focus of the investigations by the EPA and the California Air Resources Board, plus approximately 80,000 larger 3-liter vehicles that EPA and California regulators discovered had defeat devices installed.

DOJ and car companies typically negotiate penalties downward and settle before trial on emissions issues. But Monday's move by the government was surprising because settlements and complaints are usually filed simultaneously - plus, the company has already admitted some fault and is the subject of a parallel criminal investigation, a former senior DOJ official told POLITICO.

"Typically in those contexts, companies try to make nice with DOJ on the civil side and get through the issues ... so this is a very aggressive move," the former official said. "They're a consumer company. They have a brand that's taken a huge hit."

The federal lawsuit comes as the EPA and CARB continue to negotiate a recall and remedy process for the nearly 500,000 2-liter diesels in the United States. California regulators plan to respond to VW's proposal by Jan. 14, and they've also ordered the company to develop a recall plan for the 3-liter vehicles.

Cynthia Giles, the EPA's assistant administrator for enforcement and compliance assurance, indicated in a statement that talks between regulators and VW officials have hit roadblocks. "So far, recall discussions with the company have not produced an acceptable way forward," she said. "These discussions will continue in parallel with the federal court action."

Volkswagen has admitted that company engineers knowingly installed defeat devices on the smaller engines but has denied that high-level executives directed the subterfuge. Meanwhile, the company has pushed back on the assertion by California and the EPA that the software in the 3-liter vehicles was included to skirt U.S. air pollution laws, though officials from Audi - which VW owns - later admitted to regulators that the cars in question did contain previously undisclosed emissions control devices.

"Volkswagen will continue to work cooperatively with the EPA on developing remedies to bring the [diesel] vehicles into full compliance with regulations as soon as possible," the company said in a statement. "In addition, we are working with Kenneth Feinberg to develop an independent, fair and swift process for resolving private consumer claims relating to these issues. We will continue to cooperate with all government agencies investigating these matters."

A House Energy and Commerce panel is conducting its own investigation of the scandal.

"This is another step in the process of holding Volkswagen accountable for its actions" a committee spokesman said. "These laws are in place for a reason and our investigation of VW's cheating continues."

VW and DOJ could still reach a settlement, the former Justice official said, though that probably means the company would end up with a heftier bill. "There's no doubt in my mind that they're going to want billions from VW," he said.

The automaker could also seek a stay on the civil case until the criminal probe ends.

Regardless of next steps, the former official said, the federal government's move this week indicates there's some bad blood.

"This signals to me that the government thinks VW is not working with them and continues to be obstructive," he said. "So the optics are very, very bad."

Volkswagen Shares Fall on Fears of Bigger U.S. Penalty

Investors worry German auto maker could face bigger fine than $18 billion first estimated
Mike Spector, The Wall Street Journal
Updated Jan. 5, 2016 10:35 a.m. ET
http://www.wsj.com/articles/volkswagen-shares-fall-on-fears-of-bigger-u-s-penalty-1452006491?mod=WSJ_article_EditorsPicks_0

FRANKFURT— Volkswagen AG **VLKAY -6.63 %** shares plunged Tuesday on speculation a U.S. Justice Department lawsuit could potentially cost the company tens of billions of dollars in penalties, significantly more than the $18 billion previously estimated.

The civil lawsuit reaffirms allegations environmental regulators made last year that Volkswagen installed "defeat" devices to dupe emissions tests in 580,000 diesel-powered vehicles sold in the U.S. It significantly ramps up pressure on the company by putting the case before a federal judge and formally seeking court-ordered penalties.

The speculation over the scale of the penalty hinges on wording in Justice Department's suit, filed on behalf of the Environmental Protection Agency. The Justice Department cites four violations, which could result in fines between $2,750 to $37,000 per vehicle per violation. Analysts speculated on Tuesday that the government could seek four separate fines, with a much higher total than previously expected.

"This could lead to an upper level of $80 billion," ING analysts said in a research note, but "the likelihood of the maximum fine being levied across each of the violations is unlikely."

Specific figures in the complaint, however, indicate the maximum penalty would be closer to $45 billion, based on the varying fines per violation.

Precedents show that courts usually don't stack fines on top of each other and levy the total amount that a party seeks. Ultimately the penalties will be decided by the federal judge.

VW sued by U.S. for environmental violations

Ryan Beene, Automotive News

January 4, 2016 - 1:06 pm ET -- UPDATED: 1/4/16 3:37 pm ET - adds details, copy of suit

http://www.autonews.com/article/20160104/OEM11/160109980/vw-sued-by-u.s.-for-environmental-violations

WASHINGTON (Reuters) -- The U.S. Justice Department today filed a civil suit against Volkswagen AG for allegedly violating the Clean Air Act by installing illegal devices to impair emission control systems in 600,000 vehicles.

The allegations in the lawsuit carry penalties that could cost Volkswagen billions of dollars, a senior Justice Department official said.

"The United States will pursue all appropriate remedies against Volkswagen to redress the violations of our nation's clean air laws," said Assistant Attorney General John Cruden, head of the departments environment and natural resources division.

The lawsuit will be filed in the Eastern District of Michigan and then transferred to Northern California, where class-action lawsuits against Volkswagen are pending.

The Justice Department lawsuit accuses Volkswagen of four counts of violating the U.S. Clean Air Act, including tampering with the emissions control system and failing to report violations.

"We're alleging that they knew what they were doing, they intentionally violated the law and that the consequences were significant to health," the senior Justice Department official said.

The Justice Department has also been investigating criminal fraud allegations against Volkswagen for misleading U.S. consumers and regulators. Criminal charges would require a higher burden of proof than the civil lawsuit.

The civil lawsuit does not preclude the Justice Department from pursuing criminal charges against Volkswagen, said the Justice Department official.

Material omissions

The suit details VW's environmental violations and alleges that VW tried to hide them from regulators.

"Volkswagen AG knowingly concealed facts that would have revealed" that about 500,000 2.0-liter diesels contained two emissions calibrations -- one for the road and another for the test lab, the complaint said. The government's efforts to "learn the truth" about the excess 2.0-liter emissions were "impeded and obstructed by material omissions and misleading information provided by VW entities including at least VWoA and Volkswagen AG."

The complaint also made similar charges against Volkswagen AG and Audi AG for their roles in the government's probe into "irregularities" in the 3.0-liter diesel used mainly in SUVs and larger sedans from Audi.

Volkswagen acknowledged the suit in a statement, but stopped short of responding to specific claims, which it noted were included in the EPA and California Air Resources Board violation notices issued last fall.

"Volkswagen will continue to work cooperatively with the EPA on developing remedies to bring the TDI vehicles into full compliance with regulations as soon as possible. In addition, we are working with Kenneth Feinberg to develop an independent, fair and swift process for resolving private consumer claims relating to these issues," VW said in its statement. "We will continue to cooperate with all government agencies investigating these matters."

Legal implications

Volkswagen's earlier admissions eliminate almost any possibility that the automaker could defend itself in court, said attorney Daniel Riesel of Sive, Paget & Riesel P.C, who defends companies accused of environmental crimes.

To win the civil case, the government does not need to prove the degree of intentional deception at Volkswagen -- just that the cheating occurred, Riesel said. "I don't think there is any defense in a civil suit," he said.

Instead, the automaker will seek to negotiate a lower penalty by arguing that the maximum would be "crippling to the company and lead to massive layoffs," Riesel said.

Ryan Beene of Automotive News contributed to this report.

Volkswagen shares slide after US government sues automaker

By AP – 1/5/16 8am

http://news.yahoo.com/volkswagen-shares-slide-us-government-sues-automaker-093822645--finance.html

FILE - In this Sept. 23, 2015 file photo Volkswagen ornaments sit in a box in a scrap yard in Berlin, Germany. Federal authorities are suing Volkswagen over emissions-cheating software found in nearly 600,000 vehicles sold in the United States. The Justice Department and the Environmental Protection Agency on Monday filed a civil complaint against the German automaker in U.S. District Court in Detroit. (AP Photo/Michael Sohn, file)

FRANKFURT, Germany (AP) — Shares in Volkswagen AG are sliding after the U.S. Justice Department sued the German automaker over emissions-cheating software fitted to diesel vehicles.

Volkswagen's shares were 3.1 percent lower at 122.45 euros ($133.05) in Frankfurt trading on Tuesday morning — easily the worst performer on the DAX index of blue chip stocks, which was 0.4 percent higher overall.

The Justice Department's move on Monday potentially exposes the company to billions in fines for clean air violations.

Volkswagen set aside 6.7 billion euros to deal with the costs of recalling and fixing cars after the scandal erupted in September, but the ultimate costs to the company are expected to be considerably higher. A raft of private class-action lawsuits filed by angry VW owners also is pending.

Clips #5

This is the statement VW America in Herndon is sending to reporters in response:

Today, the United States Department of Justice, on behalf of the U.S. Environmental Protection Agency (EPA) filed a civil lawsuit against Volkswagen, Audi and Porsche in the United States District Court for the Eastern District of Michigan. The claims in the Complaint pertain to the 2.0L and 3.0L TDI engine equipped vehicles

that have been the subject of EPA investigations and allege violations of the same provisions of the Clean Air Act as were noted in the EPA's September 18 and November 2 Notices of Violation.
Volkswagen will continue to work cooperatively with the EPA on developing remedies to bring the TDI vehicles into full compliance with regulations as soon as possible. In addition, we are working with Kenneth Feinberg to develop an independent, fair and swift process for resolving private consumer claims relating to these issues. We will continue to cooperate with all government agencies investigating these matters and will follow up with you as additional information becomes available.

Clips #4 (3:10 pm)

Included: AP (updated) CNN Money, The Atlantic, USA Today (updated), Consumer Affairs

Previous: WSJ, AP (updated), Bloomberg, NY Times, ABC, NPR, Reuters (via Business Insider), AP (via Yahoo/LA Times/Huffington Post)

U.S. Sues Volkswagen Over Diesels Designed to Cheat Emissions Tests

BY ASSOCIATED PRESS -- updated 1:55pm
http://www.nbcnews.com/business/autos/u-s-sues-volkswagen-over-diesels-designed-cheat-emissions-tests-n489926

WASHINGTON -- The Justice Department sued Volkswagen on Monday over emissions-cheating software found in nearly 600,000 diesel vehicles sold in the United States.

The civil complaint against the German automaker, filed on behalf of the Environmental Protection Agency in U.S. District Court in Detroit, alleges the company illegally installed software designed to make its diesel engines pass federal emissions standards while undergoing laboratory testing. The vehicles then switched off those measures to boost performance in real-world driving conditions, resulting in greenhouse gas emissions up to 40 times greater than federal environmental standards.

"Car manufacturers that fail to properly certify their cars and that defeat emission control systems breach the public trust, endanger public health and disadvantage competitors," said John C. Cruden, the assistant attorney general for the Justice Department's Environment and Natural Resources Division.

"The United States will pursue all appropriate remedies against Volkswagen to redress the violations of our nation's clean air laws alleged in the complaint," he said.

There was no immediate response to messages seeking comment Monday from Volkswagen's U.S. headquarters.

The company first admitted in September that the cheating software was included in its diesel cars and SUVs sold since the 2009 model year. The company is negotiating a massive mandatory recall with U.S. regulators and potentially faces more than $18 billion in fines for violations of the federal Clean Air Act.

The company could also still face separate criminal charges, while a raft of private class-action lawsuits filed by angry VW owners are pending.

"With today's filing, we take an important step to protect public health by seeking to hold Volkswagen accountable for any unlawful air pollution, setting us on a path to resolution," said Assistant Administrator Cynthia Giles for EPA's Office of Enforcement and Compliance Assurance. "So far, recall discussions with the company have not produced an acceptable way forward. These discussions will continue in parallel with the federal court action."

Volkswagen could be hit with $18 billion in U.S. fines
by Chris Isidore, CNN Money - January 4, 2016: 2:13 PM ET
http://money.cnn.com/2016/01/04/news/companies/volkswagen-emissions-cheating-suit-fine/index.html
Volkswagen could be hit with $18 billion in fines after the EPA and Justice Department sued the German auto maker over its emission cheating software.
The federal agencies filed a civil lawsuit in Detroit federal court Monday. It says EPA will seek fines of up to $37,500 per diesel car that violates U.S. environmental rules. It's also seeking up to $3,750 for each piece of equipment that was put there to cheat emissions tests.

There are about 500,000 diesel cars on the road from Volkswagen and its luxury brand Audi that violate the environmental rules, according to the suit. That means the fines could quickly top $18 billion if VW has to pay the full amount spelled out in the suit.
The suit is seeking only civil damages and not criminal penalties, although the EPA and Justice say they have not closed the door on a possible criminal action.
Volkswagen has already admitted its cars had illegal software installed to trick emissions tests into thinking they complied with regulations, when in fact they would dump up to 40 times the allowed level of pollutants into the air. It has said it is working with U.S. and California environmental regulators on a fix to the problem, but he EPA said Monday that it has yet to reach an agreement on how to fix the problem.
A Volkswagen (VLKAY) spokeswoman did not have an immediate comment on the suit Monday.

United States v. Volkswagen

The Justice Department is suing the automaker over illegal emissions-control software installed in thousands of diesel vehicles.

BY MARINA KOREN, 2:32 PM ET
HTTP://WWW.THEATLANTIC.COM/BUSINESS/ARCHIVE/2016/01/UNITED-STATES-SUES-VOLKSWAGEN/422508/

The United States is suing Volkswagen for allegedly violating U.S. federal environmental laws by installing illegal software in thousands of its diesel vehicles and cheating on emissions tests.

The U.S. Justice Department, on behalf of the Environmental Protection Agency, on Monday filed a civil complaint against the German automaker, as well as Porsche and Audi, both part of the Volkswagen Group.

The complaint, filed in Detroit, Michigan, alleges that Volkswagen breached the Clean Air Act, a major environmental law aimed at reducing air pollution, by selling nearly 600,000 diesel-engine vehicles in the U.S. that were equipped with devices that deliberately circumvented U.S. regulations on emissions, "resulting in harmful air pollution."

"Car manufacturers that fail to properly certify their cars and that defeat emission control systems breach the public trust, endanger public health and disadvantage competitors," said Assistant Attorney General John Cruden, head of the Justice Department's Environment and Natural Resources Division, in a statement. "The United States will pursue all appropriate remedies against Volkswagen to redress the violations of our nation's clean air laws alleged in the complaint."

The Justice Department says the software was able to detect when a given vehicle was being tested for compliance with EPA emissions standards, and would turn on acceptable emissions controls only during that time. On the road, the cars emitted nitrogen dioxide, an air pollutant, up to 40 times the levels allowed.

The fraud came to light last September when the Obama administration ordered Volkswagen to pull 500,000 of its diesel cars off the road. The administration said U.S. regulators had found that starting in 2009, the German automaker had installed illegal software in its "clean diesel" vehicles in order to dodge emissions standards set by the EPA for certain air pollutants, like smog.

Volkswagen quickly owned up to rigging the tests, and revealed it had installed the software in 11 million cars worldwide. Its CEO, Martin Winterkorn, resigned days after the U.S. announcement. The company's shares nosedived. Michael Horn, the company's top U.S. executive, admitted "we have totally screwed up," and was called to testify before the House Commerce and Energy Committee in October, where lawmakers heavily castigated him and the automaker.

A Justice Department official told Reuters on Monday the lawsuit could cost Volkswagen "billions of dollars." The automaker has already set aside billions of euros to handle the fallout from the scandal.

Justice Department alleges VW violated Clean Air Act

<image001.png>Chris Woodyard, USA TODAY 2:37 p.m. EST January 4, 2016
http://www.usatoday.com/story/money/cars/2016/01/04/justice-epa-vw-clean-air-act/78262392/

The Justice Department filed a civil complaint Monday against Volkswagen alleging nearly 600,000 cars with diesel engines in the U.S. violate emissions laws and that many were imported in violation of the Clean Air Act.

The lawsuit was filed in Detroit on behalf of the U.S. Environmental Protection Agency, which worked with the California Air Resources Board in exposing the violations last year. VW has admitted to rigging cars with 2-liter diesel engines, and the EPA found violations in vehicles with 3-liter diesels as well.

The complaint alleges that the nearly 600,000 diesel engine vehicles built since 2009 were equipped with illegal "defeat devices" installed to impair emission control systems. That resulted in higher emissions that allowed by law.

The suit also alleges that VW violated the Clean Air Act by importing vehicles into the U.S. that have far higher emissions than are allowed under their certification.

"Car manufacturers that fail to properly certify their cars and that defeat emission control systems breach the public trust, endanger public health and disadvantage competitors," said Assistant Attorney General John Cruden in a statement. "The United States will pursue all appropriate remedies against Volkswagen to redress the violations of our nation's clean air laws alleged in the complaint."

The suit was filed against Volkswagen corporate entities in Germany and the U.S. and its Audi and Porsche brands.

The EPA issued a statement saying the suit will hold Volkswagen accountable while it tries to reach a deal with the automaker on how to resolve the issue with recalls. However, EPA Assistant Administrator Cynthia Giles says the talks are not going well so far.

"With today's filing, we take an important step to protect public health by seeking to hold Volkswagen accountable for any unlawful air pollution, setting us on a path to resolution," she said in a statement.

The complaint says 499,000 cars equipped with the 2-liter, four-cylinder diesel engines were designed to exceed EPA clean-air standards for nitrogen oxides by up to 40 times the legal amount during normal driving. They were rigged with software to detect when they were being tested for emissions. Only then, while being tested, did their engines meet the standard.

In addition, it says Volkswagen Group equipped 85,000 vehicles with 3-liter six-cylinder diesel engines to also beat emissions tests by operating in a "temperature conditioning" mode. At other times in normal driving, the VW, Porsche and Audi vehicles spewed nitrogen emissions at up to nine times the EPA permitted level.

Feds sue Volkswagen for dirty diesel violations

Fines could cost VW billions; criminal charges also possible
ConsumerAffairs

By James R. Hood

http://www.consumeraffairs.com/news/feds-sue-volkswagen-for-dirty-diesel-violations-010416.html

ConsumerAffairs' founder and former editor, Jim Hood formerly headed Associated Press Broadcast News, directing coverage of major news events worldwide. He also served as Senior Vice President of United Press International and was the founder and editor of Zapnews, a newswire service for radio and television.

The Justice Department today hit Volkswagen with a lawsuit charging that the automaker violated the Clean Air Act by installing defeat devices on some VW, Audi, and Porsche diesel vehicles that would not otherwise have met federal emission standards.

Possible penalties could reach into the billions of dollars and criminal charges against VW are still possible, Justice Department officials said. The automaker also faces numerous class action lawsuits filed on behalf of consumers, as well as actions by regulators around the globe.

“Car manufacturers that fail to properly certify their cars and that defeat emission control systems breach the public trust, endanger public health and disadvantage competitors,” said Assistant Attorney General John C. Cruden.

Noting that it has been several months since the defeat devices were discovered, the government made clear its patience with VW is wearing thin.

“So far, recall discussions with the company have not produced an acceptable way forward. These discussions will continue in parallel with the federal court action,” said Cynthia Giles, assistant administrator of the Environmental Protection Agency.

“With today’s filing, we take an important step to protect public health by seeking to hold Volkswagen accountable for any unlawful air pollution, setting us on a path to resolution,” Giles said.

600,000 sold

<image002.png>Consumers rate Volkswagen

The complaint formally lists the allegations that have dribbled out over the last several months, charging that nearly 600,000 diesel engine vehicles had illegal defeat devices installed and that Volkswagen violated the Clean Air Act by selling cars that are designed differently from what Volkswagen had stated in applications for certification to EPA and the California Air Resources Board (CARB).

"The alleged misrepresentations allowed almost 600,000 diesel engines to emit excessive air pollution across the country, harming our health and cheating consumers,” said U.S. Attorney Barbara L. McQuade for the Eastern District of Michigan.

In particular, the complaint alleges that the deceptive software allowed the nearly 600,000 vehicles to emit up to 40 times the allowable level of nitrogen oxide (NOx), which the complaint said contributes to harmful ground-level ozone and fine particulate matter.

Health effects

"These pollutants are linked with asthma and other serious respiratory illnesses. Exposure to ozone and particulate matter is also associated with premature death due to respiratory-related or cardiovascular-related effects. Children, the elderly and people with pre-existing respiratory disease are particularly at risk of health effects from exposure to these pollutants," the Justice Department said in a prepared statement.

"Recent studies indicate that the direct health effects of NOx are worse than previously understood, including respiratory problems, damage to lung tissue and premature death."

Models named

Affected 2.0 liter diesel models and model years include:

Jetta (2009-2015)
Jetta Sportwagen (2009-2014)
Beetle (2013-2015)
Beetle Convertible (2013-2015)
Audi A3 (2010-2015)
Golf (2010-2015)
Golf Sportwagen (2015)
Passat (2012-2015)

Affected 3.0 liter diesel models and model years include:

Volkswagen Touareg (2009-2016)
Porsche Cayenne (2013-2016)
Audi A6 Quattro (2014-2016)
Audi A7 Quattro (2014-2016)
Audi A8 (2014 – 2016)
Audi A8L (2014-2016)
Audi Q5 (2014-2016)
Audi Q7 (2009-2015)

Clips #3 (2:00 pm)

Included: WSJ, AP (updated), Bloomberg

Previous: NY Times, USA Today, ABC, NPR, Reuters (via Business Insider), AP (via Yahoo/LA Times/Huffington Post)

U.S. Sues Volkswagen Over Emissions Scandal

DOJ alleges VW installed illegal emissions defeat devices in nearly 600,000 diesel-engine vehicles

Anne Steele, The Wall Street Journal – updated 2:31pm
http://www.wsj.com/articles/u-s-sues-volkswagen-over-emissions-scandal-1451932799

The U.S. Department of Justice on Monday filed suit against Volkswagen AG **VLKAY -3.50 %** , alleging it installed illegal emissions defeat devices in nearly 600,000 diesel-engine vehicles.

The civil complaint, filed on behalf of the Environmental Protection Agency, alleges the German auto maker violated the Clean Air Act by making and selling vehicles that were designed differently from what Volkswagen had stated in applications for certification to the EPA and another regulator, the California Air Resources Board.

A spokesperson for Volkswagen wasn't immediately available for comment.

The defeat devices impair vehicle emission-control systems, causing vehicles to exceed the EPA's standards.

The civil complaint civil complaint was filed federal court in Detroit against Volkswagen AG, Audi AG **NSU -0.13 %** , Volkswagen Group of America Inc., Volkswagen Group of America Chattanooga Operations LLC, Porsche AG **POAHY -2.82 %** and Porsche Cars North America Inc.

The U.S. "will pursue all appropriate remedies against Volkswagen to redress the violations of our nation's clean air laws alleged in the complaint," said Assistant Attorney General for the Justice Department's Environment and Natural Resources Division, John Cruden.

US sues VW over emissions-cheating software in diesel cars

By Michael Biesecker and Eric Tucker, Associated Press

WASHINGTON (AP) -- The Justice Department sued Volkswagen on Monday over emissions-cheating software found in nearly 600,000 vehicles sold in the United States.

The civil complaint against the German automaker, filed on behalf of the Environmental Protection Agency in U.S. District Court in Detroit, alleges the company illegally installed software designed to make its diesel engines pass federal emissions standards while undergoing laboratory testing. The vehicles then switched off those measures to boost performance in real-world driving conditions, resulting in greenhouse gas emissions up to 40 times greater than federal environmental standards.

"Car manufacturers that fail to properly certify their cars and that defeat emission control systems breach the public trust, endanger public health and disadvantage competitors," said John C. Cruden, the assistant attorney general for the Justice Department's Environment and Natural Resources Division.

"The United States will pursue all appropriate remedies against Volkswagen to redress the violations of our nation's clean air laws alleged in the complaint," he said.

There was no immediate response to messages seeking comment Monday from Volkswagen's U.S. headquarters.

The company first admitted in September that the cheating software was included in its diesel cars and SUVs sold since the 2009 model year. The company is negotiating a massive mandatory recall with U.S. regulators and potentially faces more than $18 billion in fines for violations of the federal Clean Air Act.

The company could also still face separate criminal charges, while a raft of private class-action lawsuits filed by angry VW owners are pending.

"With today's filing, we take an important step to protect public health by seeking to hold Volkswagen accountable for any unlawful air pollution, setting us on a path to resolution," said Assistant Administrator Cynthia Giles for EPA's Office of Enforcement and Compliance Assurance. "So far, recall discussions with the company have not produced an acceptable way forward. These discussions will continue in parallel with the federal court action."

Volkswagen Sued by U.S. for Cheating on Emissions Standards

By Tom Schoenberg and Alan Katz, Bloomberg – 1:15pm
http://www.bloomberg.com/news/articles/2016-01-04/volkswagen-sued-by-u-s-for-cheating-on-emissions-standards

The Justice Department sued Volkswagen AG, accusing the German automaker of installing illegal devices meant to defeat emissions testing on nearly 600,000 vehicles.
The complaint filed Monday in federal court in Detroit is the first case against the company brought by the Justice Department, which is also investigating the car maker for possible criminal conduct related to the devices.
"Car manufacturers that fail to properly certify their cars and that defeat emission control systems breach the public trust, endanger public health and disadvantage competitors," Assistant Attorney General John Cruden said in a statement.
The Environmental Protection Agency, which in September announced Volkswagen violated federal law by using defeat devices in diesel engine vehicles, said that recall discussions with the company hadn't been resolved.
In addition to Volkswagen, the lawsuit also names company units Audi AG, Porsche AG and Porsche Cars North America as defendants.
The U.S. said the violations involved car models from 2009 to 2016 including some Volkswagen Jettas, Golfs and Passats, as well as the Audi A6 and A7 Quattro.

Complaint Filing Clips #2 (1:40pm)

Included: NY Times, USA Today, ABC, NPR

Previous: Reuters (via Business Insider), AP (via Yahoo/LA Times/Huffington Post)

VW Sued by U.S. in Diesel Emissions Scandal

By CORAL DAVENPORT and DANNY HAKIM, NY Times

WASHINGTON — The Justice Department challenged the German automaker Volkswagen in federal court Monday, saying that the company installed illegal devices in nearly 600,000 diesel engine systems to impair emissions controls, thereby increasing harmful air pollution.

The civil complaint, filed in Detroit, comes after Volkswagen admitted in September that it had installed software designed to cheat on emissions tests in 11 million of its diesel vehicles worldwide, setting off one of the largest corporate scandals in the auto industry's history.

Since then, the company's chief executive officer, Martin Winterkorn, has resigned, nine employees have been suspended, and the company has begun the twin tasks of designing fixes for the vehicles and containing consumer outrage and litigation.

Regulators across the globe, including in India, South Korea and Germany, are conducting investigations, as are attorneys general in all 50 states. The Justice Department has been seen as the only agency that might hold executives personally accountable.

But given the cascade of revelations, the civil complaint, which does not involve criminal charges or auto executives facing charges, is something of a blow to the Obama administration's highly promoted new strategy for getting tough on corporate crime. The Justice Department has gained a reputation in recent years for forcing companies to pay big fines, while sparing the executives involved. In September, Deputy Attorney General Sally Q. Yates said that impression had weakened public confidence and vowed to change it.

"With today's filing, we take an important step to protect public health by seeking to hold Volkswagen accountable for any unlawful air pollution, setting us on a path to resolution," said Cynthia Giles, assistant administrator for the Environmental Protection Agency's Office of Enforcement and Compliance Assurance. "So far, recall discussions with the company have not produced an acceptable way forward. These discussions will continue in parallel with the federal court action."

DOJ Seeking Billions From Volkswagen, Audi and Porsche in New Lawsuit

By Mike Levine, ABC – posted 1:09pm
http://abcnews.go.com/Politics/doj-seeking-billions-volkswagen-audi-porsche-lawsuit/story?id=36082971

The Justice Department is filing a federal lawsuit against Volkswagen, Audi and Porsche which seeks billions of dollars in penalties over claims that the car companies installed devices that deliberately misreported emissions, according to a senior Justice Department official. Nearly 600,000 vehicles were installed with these devices.

In some cases, the vehicles being sold in the United States with so-called "defeat devices" sent as much as 40 times the pollutants into the air as allowed under U.S. law, the official said.

U.S. Files Lawsuit Against Volkswagen Over Emissions Trickery

Bill Chappell, NPR – Updated 1:40 pm

http://www.npr.org/sections/thetwo-way/2016/01/04/461927119/u-s-files-lawsuit-against-volkswagen-over-emissions-trickery

Volkswagen's use of a "defeat device" to fool U.S. regulators has resulted in a federal lawsuit against the company. Volkswagen has acknowledged that millions of its diesel cars worldwide relied on a ruse to skirt emissions controls.

The civil complaint was filed in federal court in Detroit, with the Department of Justice acting on behalf of the Environmental Protection Agency.

NPR's Marilyn Geewax, a senior editor on the business desk, passes along this summary of the complaint:

"The DOJ alleges that nearly 600,000 diesel engine vehicles had illegal defeat devices installed that impair their emission control systems and cause emissions to exceed EPA's standards, resulting in harmful air pollution.

"The complaint further alleges that Volkswagen violated the Clean Air Act by selling vehicles that were designed differently from what Volkswagen had stated in applications for certification to EPA and the California Air Resources Board."

The EPA's claims shocked and angered many Volkswagen owners; the case also led a House committee to call Michael Horn, the CEO of Volkswagen's U.S. business, to testify on Capitol Hill.

As we wrote at the time, when he was asked whether software that turned off vehicles' emissions controls unless they were undergoing an official test was was installed "for the express purpose of beating tests," Horn said that to his knowledge, "It was installed for this purpose, yes."

Complaint Filing Clips #1 (1:20pm)

Included are: Reuters (via Business Insider), AP (via Yahoo/LA Times)

U.S. files civil suit against Volkswagen for environment violations

WASHINGTON (Reuters) - The U.S. Justice Department on Monday filed a civil suit against Volkswagen AG for allegedly violating the Clean Air Act by installing illegal devices to impair emission control systems in 600,000 vehicles.

The allegations in the lawsuit carry penalties that could cost Volkswagen billions of dollars, a senior Justice Department official said.

"The United States will pursue all appropriate remedies against Volkswagen to redress the violations of our nation's clean air laws," said Assistant Attorney General John Cruden, head of the departments environment and natural resources division.

The lawsuit will be filed in the Eastern District of Michigan and then transferred to Northern California, where class-action lawsuits against Volkswagen are pending.

It does not preclude the Justice Department from pursuing criminal charges against Volkswagen, said a senior Justice Department official.

(Reporting by Julia Edwards and David Shepardson; Editing by Susan Heavey)

Read the original article on Reuters.

Associated Press
http://www.latimes.com/business/la-fi-volkswagen-emissions-lawsuit-20160104-story.html
By AP - updated 10:40 am

Federal authorities are suing Volkswagen over emissions-cheating software found in nearly 600,000 vehicles sold in the United States.

The Justice Department and the Environmental Protection Agency on Monday filed a civil complaint against the German automaker in U.S. District Court in Detroit.

The lawsuit alleges the company illegally installed software designed to make its diesel engines pass federal emissions standards when undergoing laboratory testing. The vehicles then switched off those measures to boost performance in real-world driving conditions. That resulted in greenhouse gas emissions at up to 40 times federal environmental standards.

Volkswagen first admitted in September that the cheating software was included in its diesel cars sold since the 2009 model year. The company could still face separate criminal charges and is negotiating a massive recall with U.S. regulators.

Receive date	Requester	Description	Staff contact	Due Date	Comment/Status
5/18/2016	**Reuters** David Shepardson EPA-HQ-2016-006783	all letters, emails and communications between EPA and General Motors, Daimler AG and its Mercedes-Benz USA unit, Mitsubishi Motors Inc and any other automakers involving questions about errors in fuel economy labels or emissions testing from Jan. 1, 2016 through the present.	CD Linc Wehrly	6/17/2016	An initial set of responsive documents was sent on February 8th relating to GM. Staff continues to process remaining records for Daimler/Mercedes and Mitsubishi.

Receive date	Requester	Description	Staff contact	Due Date	Comment/Status
3/8/2017	**DIE ZEIT** Simon Kerbusk [HYPERLINK "mailto:Jeffrey.a.cook@abc.com"] EPA-HQ-2017-004434	copies of the following documents, which are filed with, retained by, or prepared by (EPA): Emission test results for light vehicles with diesel engines by manufacturer Daimler/Mercedes Benz from 2015 to the present. This especially includes testing for nitrogen oxides NOx and carbon dioxide CO2 emissions. It may also include tests under the supervision of the California Air Resources Board (CARB). I request results from (a) emission testing of in-use cars and (b) emission testing for EPA certification of new car models for the model years 2016 and 2017. In addition, I request any documents of communication between the EPA (or CARB) and manufacturer Daimler/Mercedes Benz about the above specified emission test results.	CD Linc Wehrly	4/19/2017	10 day unusual circumstances extension.

Receive date	Requester	Description	Staff contact	Due Date	Comment/Status
3/8/2017	**ALL Counsel P.C.** Andrew Lee [HYPERLINK "mailto:Jeffrey.a.cook@abc.com"] EPA-HQ-2017-004515	Records consisting of or relating to the "Enviroflash of July 5, 2011" published by the EPA on or about July 5, 2011 (the "Enviroflash"), including without limitation all drafts of the Enviroflash, documents concerning internal EPA approval of the Enviroflash, documents concerning the drafting of the Enviroflash, and all "ex parte" communications (as 5 U.S.C. Section 551 defines that term)…etc……	CD Madison Le	4/19/2017	Lotus Notes search has been conducted. An update was sent on Sept. 25th via FOIA online…..
3/21/2017	**Von Briesen & Roper** Mark Schmidt [HYPERLINK "mailto:Jeffrey.a.cook@abc.com"] EPA-HQ-2017-005016	Communication between Jan. 1, 2010 and the present with Kolmar Petrochemicals Americas that relate to Renewable Identification Numbers (RIN)	CD Madison Le	4/20/2017	

Receive date	Requester	Description	Staff contact	Due Date	Comment/Status
6/9/2017	**J.K. Technologies** Jonathan Weisheit [HYPERLINK "mailto:Jeffrey.a.cook@abc.com"] EPA-HQ-2017-008240	Referral for Release Determination from DOT regarding display applications for listed vehicles	CD Cleo Jackson		Waiting for Joan Kaminer to provide guidance on closing out…

Receive date	Requester	Description	Staff contact	Due Date	Comment/Status
6/20/2017	**Chevron Corporation** April Rutter [HYPERLINK "mailto:Jeffrey.a.cook@abc.com"] EPA-HQ-2017-008627	Requesting information regarding additive used by Chevron and AFCO.	CD Madison Le		Jim provided some information to requester. Waiting for requester to review and get back. (timeframe is August 23rd)
8/1/2017	Ricardas Cepas [HYPERLINK "mailto:Jeffrey.a.cook@abc.com"] EPA-HQ-2017-009954	disclosure of "conditional fuel economy label" issued to Tesla, Inc. and its affiliates to start sales for Model 3 car without official Monroney sticker. Also of manufacturer's test data for Model 3 submitted to EPA if any, and EPA's own test data in electronic format.	CD Linc Wehrly	8/28/2017	

Receive date	Requester	Description	Staff contact	Due Date	Comment/Status
8/31/2017	**Motley Rice Attorneys At Law** Ann Ritter EPA-HQ-2017-011009	Communication between EPA and General Motors relating to alleged defeat devices	CD Linc Wehrly David Wright	9/29/2017	

Receive date	Requester	Description	Staff contact	Due Date	Comment/Status
	Mr. Benjamin Park [HYPERLINK "mailto:Jeffrey.a.cook@abc.com"] EPA-HQ-2017-011156	This request concerns the Hyundai Motor Company, Hyundai Group, its affiliates, subsidiaries, and designees for the period of January 1985 through and including December 1986. Please produce all documents concerning the EPA (including the EPA Certification Lab in Ann Arbor, MI) and a Mr. John Park. Mr. Park may also be referred to as John K. Park, John Kwansuh Park, John Kwan-Suh Park, and any derivation thereof. In the absence of documents relating to Hyundai, the EPA, and Mr. Park, please produce all retained documents relating to Mr. John Park in the above date range.	CD Linc Wehrly		

Receive date	Requester	Description	Staff contact	Due Date	Comment/Status
9/18/2017	**Power Solutions International Inc.** Ms. Christine Ueno [HYPERLINK "mailto:Jeffrey.a.cook@abc.com"] EPA-HQ-2017-011566	Manufacturer IMPCO Test Group GZ9XD06.0DCA Certification Application Manufacturer IMPCO Test Group GZ9XD06.0DC2 Certification Application	CD Linc Wehrly		
9/20/2017	**Parallel Products** Mr. Mark Sutton [HYPERLINK "mailto:Jeffrey.a.cook@abc.com"] EPA-HQ-2017-011609	Pursuant to 40 CFR § 80.1450(d)(3) Renewable fuel producers must submit a new engineering review by January 31st every three years for each renewable fuel production facility. Pursuant to 40 CFR § 80.1464 Renewable fuel producers must submit a new annual attest by June 1 of the year following the compliance year, except as provided in paragraph (g), for each renewable fuel production facility. May I have copies of engineering reviews and attestations for MXI Environmental Services 26319 Old Trail Rd, Abingdon, VA 24201 for the previous ten (10) years?	CD Madison Le	10/19/2017	

Message

From: Brusstar, Matt [brusstar.matt@epa.gov]
Sent: 1/26/2018 7:08:04 PM
To: Watkins, Erica [Watkins.Erica@epa.gov]; Cook, Leila [cook.leila@epa.gov]; Hengst, Benjamin [Hengst.Benjamin@epa.gov]; Haley, Mike [Haley.Mike@epa.gov]; Bunker, Byron [bunker.byron@epa.gov]; Charmley, William [charmley.william@epa.gov]; Simon, Karl [Simon.Karl@epa.gov]; Grundler, Christopher [grundler.christopher@epa.gov]; Haugen, David [haugen.david@epa.gov]
CC: Moskalik, Andrew [Moskalik.Andrew@epa.gov]; Barba, Daniel [Barba.Daniel@epa.gov]; Snapp, Lisa [snapp.lisa@epa.gov]
Subject: Whitepaper: A Future Vision of Vehicle Testing (Part II)
Attachments: Future-Vision-Vehicle-Testing-Whitepaper-final.docx

Attached is the whitepaper, "A Future Vision of Vehicle Tesing, Part II", that was developed out of an inter-divisional discussion, focusing on the key questions facing OTAQ with regard to lab testing of future technologies. Lisa Snapp and I initiated this effort in response to Chris' request a few months ago arising from our Thought Salon discussion of Part I of the "Future Vision". This "Part II" material is being provided in advance of our follow-up discussion, scheduled tentatively for this Wednesday's SLT meeting (1/31).
Thanks,
Matt

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 3/31/2017 4:43:35 PM
To: Wehrly, Linc [wehrly.linc@epa.gov]; Zaremski, Sara [zaremski.sara@epa.gov]; Pugliese, Holly [pugliese.holly@epa.gov]
CC: Kenausis, Kristin [Kenausis.Kristin@epa.gov]
Subject: FW: Minor change to www.fueleconomy.gov - Search by "base" Model name; Please send Janet your comments
Attachments: EPAModelSpreadsheetComparison.xlsx

Linc, Sara, Holly, Kristin,

FYI---I just noticed you weren't on the original distribution list from Janet.

Dave

From: Hopson, Janet L. [mailto:hopsonjl@ornl.gov]
Sent: Friday, March 31, 2017 10:13 AM
To: Hula, Aaron <Hula.Aaron@epa.gov>; Good, David <good.david@epa.gov>
Cc: French, Roberts <french.roberts@epa.gov>; Bunker, Amy <Bunker.Amy@epa.gov>; Boundy, Robert Gary <boundyrg@ornl.gov>; Saulsbury, Bo <saulsburyjw@ornl.gov>
Subject: RE: Minor change to www.fueleconomy.gov - Search by "base" Model name; Please send Janet your comments

Hi Aaron, Dave:

We installed the Base Model update on fueleconomy.gov yesterday.

Thanks for sending the Trends spreadsheet – very helpful! I think our Base Model agrees pretty well with the Trends Report Model – particularly given the subjective nature of assigning the model names. We made some changes to our base model based on comments from Dave and based on your spreadsheet (listing BMW by series, combining Porsche 911 models, etc). Most remaining differences are minor, but there are a few more significant differences. For example:

- We separated cargo and passenger vans because they are fundamentally different from the perspective of the consumer
- We combined 1500, 2500, 3500 vans into a single group
- Based on Dave's comments, we combined the BMW models into series. However, we kept grouped the M series separately as these are marketed separately by BMW
- We grouped the MINI models differently

I've attached a spreadsheet comparing the Trends name to our base model. Column F will allow you to filter records that are different vs. same. In column G, I've put some notes about the difference. Many of the differences are insignificant (e.g. CRV vs CR-V); these are noted as "minor", in column G.

Let me know if you have any further comments/questions. I anticipate we may make changes in the future based on comments from our users. (Dave – we do intend to change the default number of vehicles displayed, but that change has not yet been implemented).

Thank you,

Janet

From: Hula, Aaron [mailto:Hula.Aaron@epa.gov]
Sent: Tuesday, March 21, 2017 8:47 AM
To: Hopson, Janet L.
Cc: Good, David; French, Roberts; Bunker, Amy; Boundy, Robert Gary; Saulsbury, Bo
Subject: RE: Minor change to www.fueleconomy.gov - Search by "base" Model name; Please send Janet your comments

Janet,

Attached is a spreadsheet that shows how we coded vehicles for the MY 2013-2016. There are a lot of subjective decisions we made so I'm not committed to this as the "correct" way to do this, but it's what we did. If nothing else we did try to put some thought into at least being as consistent as possible.

Feel free to let us know if you have any thoughts or questions.

Aaron

From: Hopson, Janet L. [mailto:hopsonjl@ornl.gov]
Sent: Friday, March 17, 2017 3:02 PM
To: Hula, Aaron <Hula.Aaron@epa.gov>
Cc: Good, David <good.david@epa.gov>; French, Roberts <french.roberts@epa.gov>; Bunker, Amy <Bunker.Amy@epa.gov>; Boundy, Robert Gary <boundyrg@ornl.gov>; Saulsbury, Bo <saulsburyjw@ornl.gov>
Subject: RE: Minor change to www.fueleconomy.gov - Search by "base" Model name; Please send Janet your comments

Hi Aaron:

I had forgotten that you provide analysis by model in the Trends report. At a glance, the methodology described in the trends report is quite similar to what we did so I'm encouraged by that! Do you have a spreadsheet or document mapping the EPA carline names to the "trend models"? That might help us if we need to coordinate methodologies in the future.

Thanks!

Janet

From: Hula, Aaron [mailto:Hula.Aaron@epa.gov]
Sent: Friday, March 17, 2017 12:25 PM
To: Hopson, Janet L.
Cc: Good, David; French, Roberts; Bunker, Amy; Boundy, Robert Gary; Saulsbury, Bo
Subject: RE: Minor change to www.fueleconomy.gov - Search by "base" Model name; Please send Janet your comments

Janet,

We've done some similar model grouping as part of the Trends report the last several years. The idea was to present some basic analysis of consumer choice options in high fuel economy vehicles. This is something that was requested by our management and has picked up some press so people are certainly interested.

Our methodology and results are described in Chapter 8, page 112 of the Trends report (attached). The figures are also part of the executive summary highlights. We did group the BMWs together by series, but also chose to keep the Prius versions separate. **Ex. 5 Deliberative Process (DP)**

Ex. 5 Deliberative Process (DP)

Ex. 5 Deliberative Process (DP)

I don't have any objections to fe.gov moving forward, but I did want to flag this as something we'll have to think about.

Aaron

From: Hopson, Janet L. [mailto:hopsonjl@ornl.gov]
Sent: Wednesday, March 15, 2017 5:06 PM
To: Good, David <good.david@epa.gov>; French, Roberts <french.roberts@epa.gov>; Bunker, Amy <Bunker.Amy@epa.gov>
Cc: Boundy, Robert Gary <boundyrg@ornl.gov>; Saulsbury, Bo <saulsburyjw@ornl.gov>
Subject: RE: Minor change to www.fueleconomy.gov - Search by "base" Model name; Please send Janet your comments

Thank you for your quick and thorough review!

We tried to do what we thought made the most sense, but happy to consider other options. It's quite a large data set (34 years/ 38000+ records!!). Just let us know if you want us to do something differently. Also, we can easily update the data in the future based on feedback from users/manufacturers.

See a few notes on your suggestions below.

Thanks!

Janet

From: Good, David [mailto:good.david@epa.gov]
Sent: Wednesday, March 15, 2017 1:05 PM
To: French, Roberts; Bunker, Amy
Cc: Kenausis, Kristin; Burke, Susan; Pugliese, Holly; Wehrly, Linc; Zaremski, Sara; Hopson, Janet L.
Subject: FW: Minor change to www.fueleconomy.gov - Search by "base" Model name; Please send Janet your comments

Rob, Amy & all,

See Janet's email message and the test server URL below. She wants to make the website more user friendly by using a "base" model name/carline name to look up vehicles.

I think it's a big improvement---because currently, some of the carline names (F150s and others) are getting to be so specific that it's hard to see the big picture.

My comments outlined below.

Please send Janet your comments when you get a chance. I'll cc Janet, so you can just reply to all (or whatever).

Dave

From: Good, David
Sent: Wednesday, March 15, 2017 12:07 PM
To: 'Hopson, Janet L.' <hopsonjl@ornl.gov>
Cc: Saulsbury, Bo <saulsburyjw@ornl.gov>; Boundy, Robert Gary <boundyrg@ornl.gov>
Subject: RE: Search by Model on fe.gov

Janet,

I played around with the new website for 30-40 minutes and I like it. Here are some suggestions (or food for thought):

1. The "View" defaults to 10 model types. [View choices are 10, 25, 50, 100 or 200 model types.] I think the display should default to 50 or 100 (or all of them). [Defaulting to 10 was confusing for me when I tried to view F150 models (or Silverado models)---until I figured out only 10 models were being displayed.]
We'll fix this. The main reason for setting the default to 10 was to reduce the size of the download for mobile users that may have a slower cellular connection. Also, this same page supports power search and we don't want users to return all 38000 + records in a single page ;-)

2. If possible, I think you should add a button for "2WD" or "4WD" or Both." This would be helpful for comparing trucks and SUVs----where the customer pretty-much knows if they want to purchase (or compare) 2WD or 4WD models. If they don't care, they can select "Both" or "All."

Ex. 5 Deliberative Process (DP)

3. It would be nice to be able to compare 2 or 3 base models (without going to a power search). For example, it would be nice to compare F150s to Silverado and GMC Sierra (full size) pickups.
This is a great idea, but our current drop-down menu won't support more than one model. BTW - We're looking at another type of menu (another project) which might allow us to do this. If that works out we'll try to implement it here.

4. I don't have a strong opinion on this-----but you might want to combine all the Prius models, e.g. the 2017 Prius, Prius c, Prius Prime, Prius v) into one base "Prius" model. Rob may have an opinion---I think he owns one.

Ex. 5 Deliberative Process (DP)

4. For EVs and PHEVs, when you initially display all base models (e.g. Ford Focus base models), it would be nice to use the normal EV or PHEV display-----which is easier for users to know that the vehicle is an EV or PHEV.
Not sure I understand this – I think you mean keep the Focus EV separate from the gasoline version? We can split them out if you prefer. We waffled back and forth about whether to separate the EVs and PHEVs or lump them with the other models.

5. For the Viper, it was labeled as a "Dodge" Viper in pre-2013 model years, 2015-2017 model years and as an "SRT" Viper in 2013-2014. You might want to think about how to fix this.
We currently don't have a fix for this – the change from Dodge to Ram for the Chrysler pickups is also a problem. This effort only addresses the model names. Note: We also have issues with combined models that we could not fix, e.g. Somerset/Skylark. Fortunately this is less common in more recent model years.

7. What are 2008 Tecstar LP Foose models? They look like normal F150 models----Should they be Ford models? The fuel is listed as gasoline----is that correct?

These records came from Bob Peavyhouse during the CASH FOR CLUNKERS scramble. They match the data Bob provided, but we're happy to edit the make/model if you want us to list them differently. The fuel is listed as premium in the data Bob provided.

I like the way you can search on several model years. It's quite useful during the 2-3 months during the model year "change-over" time period, e.g. when both 2017 and 2018 vehicles are on the lot. I like the way it makes some sense out of the F150 carline names. It also works well for Ferrari models (with and without stop-start), Camry models (displaying both conventional and hybrid Camrys). I like the way when selecting specific model years, it only displays vehicles which were labeled in those model years (and not old Pontiac, Suzuki vehicles, etc

>>). I'd like to get an opinion from the Mercedes folks, regarding the way their models are broken down into C-class, S-class, etc. Why didn't you break out BMWs into similar classes, e.g. 2-series, 3-series....7-series, etc, M-class, X-class vehicles?
Bob says...

Ex. 5 Deliberative Process (DP)

I'll circulate it around to Rob, Amy and others to get their feedback.

When do you want to go live?
We've tentatively scheduled release for end of next week.

Dave

From: Hopson, Janet L. [mailto:hopsonjl@ornl.gov]
Sent: Wednesday, March 15, 2017 9:54 AM
To: Good, David <good.david@epa.gov>
Cc: Saulsbury, Bo <saulsburyjw@ornl.gov>; Boundy, Robert Gary <boundyrg@ornl.gov>
Subject: Search by Model on fe.gov

Good Morning Dave:

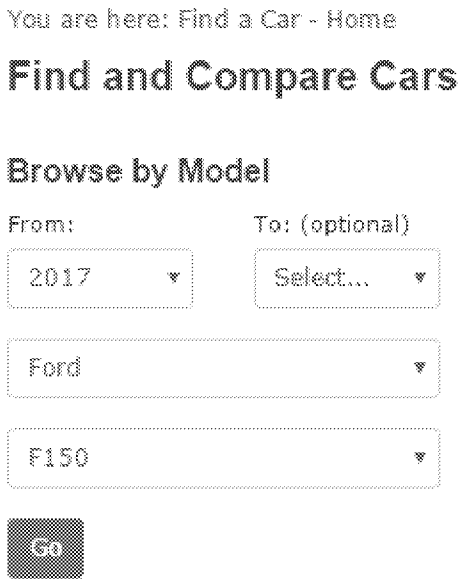
In order to improve the functionality of our Browse by Model vehicle selection, we have added a column to our database called "Base Model". This addresses two issues: 1) variations in model names from year-to-year and 2) complicated EPA carline names (e.g. F150). **There is NO CHANGE to how the vehicle is listed on fueleconomy.gov – we will still use the official EPA carline name when we display the vehicle. Also there is no change at all to "Compare Side-by-Side" where vehicles are selected one by one.**

If you look up the Ford F150 currently on fueleconomy.gov, you have to select 13 different carlines to display all of the different varieties of F150. With the new system, the user can select F150, retrieving all 20 records at the same time. Below are some screen captures. Also we have the base model data installed on our test server. The new menus will "appear" if you use the Browse by Model feature on the page below:
http://fegtest.ornl.gov/feg/findacar.shtml

I think it offers a big improvement to our multi-year model search. Please let me know if you have any comments/suggestions. This is not yet installed on fe.gov, but we hope to install it once internal testing is complete.

Thanks,

Janet



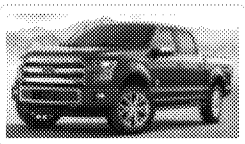
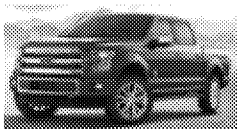
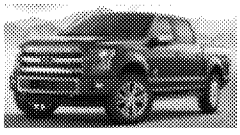
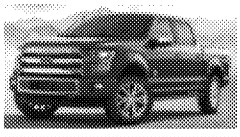
Screen capture of “part” of F150 results.

2017 Ford F150

Sorting is based on EPA Combined City/Hwy MPG.

Sort ▾ | Personalize | View 50 ▾ | Page 1

MPG | Energy & Environment | Costs

Vehicle	EPA Fuel Economy↓	Driver MPG	Annual Fuel Cost
2017 Ford F150 Pickup 2WD 2.7 L, 6 cyl, Automatic (S6), Turbo, Regular Gasoline			
Compare 	22 combined city/hwy; MPG 19 city 26 hwy; 4.5 gal/100 mi	NA	$1,550
2017 Ford F150 2WD BASE PAYLOAD LT TIRE 2.7 L, 6 cyl, Automatic (S6), Turbo, Regular Gasoline			
Compare 	21 combined city/hwy; MPG 19 city 24 hwy; 4.8 gal/100 mi	NA	$1,650
2017 Ford F150 Pickup 2WD 3.5 L, 6 cyl, Automatic (S10), Turbo, Regular Gasoline			
Compare 	21 combined city/hwy; MPG 18 city 25 hwy; 4.8 gal/100 mi	NA	$1,650
2017 Ford F150 2.7L 2WD GVWR>6649 LBS 2.7 L, 6 cyl, Automatic (S6), Turbo, Regular Gasoline			
Compare 	21 combined city/hwy; MPG 18 city 24 hwy; 4.8 gal/100 mi	NA	$1,650

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 8/15/2017 5:54:14 PM
To: Bluestein, Linda [Linda.Bluestein@ee.doe.gov]; Gibson, Robert C. [gibsonrc@ornl.gov]; Bunker, Amy [Bunker.Amy@epa.gov]; Dafoe, Wendy (NREL) [wendy.dafoe@nrel.gov]; Deitchel, Judi (NREL) [judi.deitchel@nrel.gov]; French, Roberts [french.roberts@epa.gov]; Hopson, Janet L. [hopsonjl@ornl.gov]; Pugliese, Holly [pugliese.holly@epa.gov]; Smith, Dennis A [Dennis.A.Smith@ee.doe.gov]; Wehrly, Linc [wehrly.linc@epa.gov]; Zaremski, Sara [zaremski.sara@epa.gov]; jhopson@utk.edu
Subject: RE: EV Charging Write-up for 2018 FE Guide
Attachments: EVs & PHEVs- EVs & PHEVs-level 2 charging specs.417.xlsx

Robert & all,

I may be missing something, but doesn't EPA have the best set of data for level 2 charging? See attached. Here is the summary of the level 2 recharge data in EPA's database for 2016 & 2017 EVs & PHEVs from EPA's database (which is also on the web in the datafiles at http://www.fueleconomy.gov/feg/download.shtml). There is quite a difference between EVs and PHEVs.

Level 2 charging data (miles/hour of 220V charge)

Based on EPA data as of 8/15/2017 — D.Good

	Model Year	n	Average	Min	Max	Units
EVs	2016	30	19.8	8.9	24.9	all electric driving range (miles) per hour of 220V (level 2) time to recharge battery
	2017	26	21.4	9.7	31.0	all electric driving range (miles) per hour of 220V (level 2) time to recharge battery
PHEVs	2016	18	7.6	4.7	18.0	all electric driving range (miles) per hour of 220V (level 2) time to recharge battery
	2017	19	8.6	4.7	19.4	all electric driving range (miles) per hour of 220V (level 2) time to recharge battery

Also, Here are the comments from David Wright, one of our EV and PHEV technical engineers, here at EPA:

The summary write-up in your e-mail seems reasonable to me Dave. I would just add a reference to your owner's manual or other information about your vehicle. The only time when a level 3 (high power DC) EVSE would be encountered is when an EV is on a long journey – i.e. the Tesla supercharger network.

As noted in a previous meeting you and I attended with GM, many of their Volt owners can use the 120 V Level 1 EVSE for most all of their charging needs. For most homes this provides around 1 kW of charging power which is well below the maximum power of chargers on most EVs. My EV, which probably has one of the smaller on-board AC chargers is rated at 3.3 kW. Tesla's on-board AC chargers can be up around 10 kW.

The primary factor determining the charge time is the battery capacity and the power of the on-board AC charger, which is why I would focus on referencing the owner's manual for the vehicle of interest.

Regards,

David

From: Bluestein, Linda [mailto:Linda.Bluestein@ee.doe.gov]
Sent: Monday, August 14, 2017 4:36 PM
To: Gibson, Robert C. <gibsonrc@ornl.gov>; Bunker, Amy <Bunker.Amy@epa.gov>; Dafoe, Wendy (NREL) <wendy.dafoe@nrel.gov>; Deitchel, Judi (NREL) <judi.deitchel@nrel.gov>; French, Roberts <french.roberts@epa.gov>; Good, David <good.david@epa.gov>; Hopson, Janet L. <hopsonjl@ornl.gov>; Pugliese, Holly <pugliese.holly@epa.gov>; Smith, Dennis A <Dennis.A.Smith@ee.doe.gov>; Wehrly, Linc <wehrly.linc@epa.gov>; Zaremski, Sara <zaremski.sara@epa.gov>; jhopson@utk.edu
Subject: RE: EV Charging Write-up for 2018 FE Guide

Hi Robert—My input is that the date on the EERE website would take under consideration all technologies as of January 2017 while the handbooks are 2013 and 2015 and the AFDC website information is older as well. I would go with the EERE website since it is the newest information—updated the most recently.

From: Gibson, Robert C. [mailto:gibsonrc@ornl.gov]
Sent: Monday, August 14, 2017 4:03 PM
To: Bluestein, Linda <Linda.Bluestein@ee.doe.gov>; Bunker, Amy <bunker.amy@epa.gov>; Dafoe, Wendy (NREL) <wendy.dafoe@nrel.gov>; Deitchel, Judi (NREL) <judi.deitchel@nrel.gov>; French, Rob <french.roberts@epa.gov>; Gibson, Robert C. <gibsonrc@ornl.gov>; Good, David <good.david@epa.gov>; Hopson, Janet L. <hopsonjl@ornl.gov>; Pugliese, Holly <pugliese.holly@epa.gov>; Smith, Dennis A <Dennis.A.Smith@ee.doe.gov>; Wehrly, Linc <wehrly.linc@epa.gov>; Zaremski, Sara <zaremski.sara@epa.gov>; jhopson@utk.edu
Subject: EV Charging Write-up for 2018 FE Guide

Hello Everyone,

You may remember that during our last teleconference Amy Bunker pointed out that the charging rate estimates that we used in our write-up were different from those of other DOE website pages and publications. She followed up by sending me links to those web pages/publications. (Thanks, Amy!)

I've compiled a Word table (attached) that contains the estimates from the sources Amy cited (the first three in the table) along with those from the source I was using (the last one).

The estimates for Level 1 charging are the same for all four sources, but the estimates for Level 2 and 3 vary.

I'd like for the team to discuss this during tomorrow's telecon and, if possible, come to a decision about which estimates we should use.

If anyone has insight they'd like to share ahead of tomorrow's telecon, that would be great also.

Thanks.

Robert C. Gibson
Center for Transportation Research
University of Tennessee
National Transportation Research Center, Room I-17
2360 Cherahala Blvd.
Knoxville, Tennessee 37932
TEL: 865-946-1481
FAX: 865-946-1314
gibsonrc@ornl.gov
www.fueleconomy.gov

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 8/11/2017 8:51:45 PM
To: laura.l.parker@gm.com
CC: deborah.a.zielesch@gm.com
Subject: FW: GM request for 2018 test car list data for 2018 Ford F-150 data, etc
Attachments: 17tstcar-2017-08-11.csv; 18tstcar-2017-08-11.csv

Laura,

Here are the releasable test car list data for 2017 and 2018. [They are releasable if both the Introduction to commerce date and the FE Label release date are on or before today's date.]

We decided not to post the 2018 test car list on the web until mid to late September (similar to previous years) because posting too early only leads to more questions from the web about the missing data.

Regards,

Dave

From: Danzeisen, Karen
Sent: Friday, August 11, 2017 4:40 PM
To: Good, David <good.david@epa.gov>
Subject: RE: GM request for 2018 test car list data for 2018 Ford F-150 data, etc

Dave,

Here are both the 2017 and 2018 Test Car List datasets that are releasable today. Judging by the file sizes, 2018 is only half complete.

I will send the 2017 file to the web people for posting to the webpage.

Karen E. Danzeisen
Information Technology Specialist
Office of Transportation and Air Quality
U.S. Environmental Protection Agency

danzeisen.karen@epa.gov
(734)214-4444

https://www.epa.gov/vehicle-and-engine-certification

From: Good, David
Sent: Friday, August 11, 2017 3:46 PM
To: Danzeisen, Karen <Danzeisen.Karen@epa.gov>
Cc: Cullen, Daniel <Cullen.Daniel@epa.gov>; laura.l.parker@gm.com
Subject: FW: GM request for 2018 test car list data for 2018 Ford F-150 data, etc

Karen,

When you get a chance, can you run the 2018 test car list query and either post it on the web, or email it to Laura Parker at GM?

The last update on the web for the 2017 test car list was March, 2017. There is no 2018 TCL on the web.

The 2018 Ford F150 labels are posted on www.fueleconomy.gov (so the test car list data should be releasable).

Thanks

Dave

From: Laura L. Parker [mailto:laura.l.parker@gm.com]
Sent: Friday, August 11, 2017 7:30 AM
To: Good, David <good.david@epa.gov>
Subject: FW: 2018 Ford F-150 Data Request

Dave, that time of year again . . .

From: Lynn R Gantt
Sent: Friday, August 11, 2017 7:25 AM
To: Laura L. Parker <laura.l.parker@gm.com>
Cc: Nathan MacPherson <nathan.macpherson@gm.com>; Nick Smith <nick.smith@gm.com>
Subject: 2018 Ford F-150 Data Request

Laura,

Next time you are talking to EPA – can you get the 2018 Ford Fuel Economy test data for the new powertrain combos? 2.7T, 5.0L, and 3.3L V6.

Please & Thank you.

Lynn R. Gantt
Energy & Powertrain Integration
Light Duty Full Size Truck & SUV
C: 586-335-7748

Nothing in this message is intended to constitute an electronic signature unless a specific statement to the contrary is included in this message.

Confidentiality Note: This message is intended only for the person or entity to which it is addressed. It may contain confidential and/or privileged material. Any review, transmission, dissemination or other use, or taking of any action in reliance upon this message by persons or entities other than the intended recipient is prohibited and may be unlawful. If you received this message in error, please contact the sender and delete it from your computer.

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 8/25/2017 9:51:24 PM
To: Hopson, Janet L. [hopsonjl@ornl.gov]
CC: lij1@ornl.gov
Subject: RE: data questions - Corrected datasets attached for Volvo PHEVs
Attachments: 2017 FE Guide for DOE-rev1-release dates before 8-24-2017-no-sales-8-23-2017.xlsx; 2018 FE Guide for DOE-rev1-release dates before 8-24-2017-no-sales-8-23-2017.xlsx

Janet,

Volvo 2017 & 2018 PHEVs:

Thanks for catching the Volvo errors. [Sorry about that.] Attached are revised 2017 & 2018 PHEV datasets which should clear up these errors.

The 2017 dataset only revised the 2017 Volvo XC90 AWD (PHEV) dataset---it contained the same errors as outlined in the third bullet below.

The 2018 data set revised the three 2018 Volvo PHEVs to correct the errors in the three bullets below---and added two new PHEVs (2018 Ford Fusion Energi PHEV and the 2018 Karma Revero PHEV) . The 2018 Karma PHEV is similar to the 2012 Fisker PHEV with an upgraded battery, etc.

You don't have to post these two new ones if you don't want to. I'll include them with my next dataset which I'll send you on Wed (8/30).

FFV GHG ratings on Ethanol: Regarding the 2018 Ethanol GHG values, I'll send you a complete 2018 dataset next week with the E85 GHG values. The 2017 data sets seemed to be OK (and included them)---but something happened with the macro when it tried to calculate the 2018 values. I'll fix the macro for 2018 (and make sure the 2017 values were calculated correctly).

Dave

From: Hopson, Janet L. [mailto:hopsonjl@ornl.gov]
Sent: Friday, August 25, 2017 1:37 PM
To: Good, David <good.david@epa.gov>
Subject: data questions

Hi Dave:

We are struggling with the Volvo PHEVs:

- 2018 Volvo S90 AWD (PHEV) data shows an all-electric range of 12. CD range of 21. This seems wrong and doesn't match the labels.
- CD electricity consumption in kW-hrs/100 miles for all three vehicles is shown as 60kW-hr/100 miles in the data (city/hwy/cmb). This doesn't match the labels.
- CD unrounded values (both MPG and KW-hr/100miles) are inconsistent with the rounded values. (There is a note about voluntarily lowering, but shouldn't they be consistent?)

We just realized that none of the 2018 FFVs have GHG ratings on Ethanol? This value is used in the FEG.

Thanks!

Janet

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 10/12/2017 6:55:56 PM
To: Anderson, Tom [Anderson.Tom@epa.gov]
CC: Gordinier, Terry [Gordinier.Terry@epa.gov]
Subject: 2016 EVs, PHEVs & Fuel Cell Vehicles attached
Attachments: 2016 EVs-FCVs & PHEVs.xlsx

Tom,

You can use this file to determine the advanced technology vehicles when reviewing 2016 CAFEGHG reports. It has tabs for EVs, PHEVs & FCVs.

Dave

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 10/10/2017 9:41:32 PM
To: hopsonjl@ornl.gov
CC: Hula, Aaron [Hula.Aaron@epa.gov]; Danzeisen, Karen [Danzeisen.Karen@epa.gov]; French, Roberts [french.roberts@epa.gov]; Zaremski, Sara [zaremski.sara@epa.gov]; Bunker, Amy [Bunker.Amy@epa.gov]; lij1@ornl.gov; flukerjf@ornl.gov; Wehrly, Linc [wehrly.linc@epa.gov]; baindt@ornl.gov; Kenausis, Kristin [Kenausis.Kristin@epa.gov]; Brian West [westbh@ornl.gov]
Subject: RE: 2018 FE Guide - Updated datasets attached for the web and Printed Guide;
Attachments: 2018 FE Guide for DOE-release dates before 10-11-2017-no-sales-10-10-2017.xlsx; 2017 FE Guide for DOE-EVs only-release dates before 10-11-2017-no-sales-10-10-2017.xlsx

Janet & all,

Thanks for posting the 2018 Audi A3 e-tron PHEV.

2017 Web:

There was one new EV (Mercedes Smart Fortwo Convertible). Attached is a dataset with all 28 2017 EVs to date. There were no new 2017 conventional vehicles or PHEVs.

2018 Web:

Attached is an updated 2018 FE Guide dataset for posting on the web. It is sorted by carline class (as usual). It includes 985 conventional model types increased from 972 conventional model types which I sent on Oct 3, 2017. There were no new 2018 EVs, PHEVs or FCVs.

2018 Printed Guide:

I didn't include an updated dataset for the 2018 Printed Guide----I'm assuming we are well past the "drop-dead" date. Debbie, please let me know if you need it.

As usual, please let us know if you find any errors in the attached datasets.

Dave

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 11/1/2017 10:28:55 PM
To: hopsonjl@ornl.gov
CC: Hula, Aaron [Hula.Aaron@epa.gov]; Danzeisen, Karen [Danzeisen.Karen@epa.gov]; French, Roberts [french.roberts@epa.gov]; Zaremski, Sara [zaremski.sara@epa.gov]; Bunker, Amy [Bunker.Amy@epa.gov]; lij1@ornl.gov; flukerjf@ornl.gov; Wehrly, Linc [wehrly.linc@epa.gov]; baindt@ornl.gov; Kenausis, Kristin [Kenausis.Kristin@epa.gov]; Brian West [westbh@ornl.gov]
Subject: RE: 2018 FE Guide - Updated dataset attached for the web;
Attachments: 2017 FE Guide for DOE---PHEVs-EVs-FCVs only-release dates before-11-2-2017-no-sales-11-1-2017.xlsx; 2018 FE Guide for DOE-release dates before-11-2-2017-no-sales-11-1-2017.xlsx

Janet & all,

Thanks for posting the 2018 Ford Focus EV and the 2018 Hyundai Ioniq EV.

2017 Web:

There were no new 2017 labels. As we discussed, attached is a dataset with all the 2017 EVs, PHEVs & FCVs to date. It has the corrected CD gasoline fuel consumption (0/0/0 for city/hwy/combined operation) for the 2017 BMW X5 xDrive40e PHEV.

2018 Web:

Attached is an updated 2018 FE Guide dataset for posting on the web. It is sorted by carline class (as usual). It includes 1077 conventional model types increased from 1020 conventional model types which I sent on Oct 20, 2017. There were no new 2018 EVs, PHEVs or FCVs.

As usual, please let us know if you find any errors in the attached datasets.

Dave

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 11/7/2017 8:51:56 PM
To: Ott, William [ott.william@epa.gov]
Subject: RE: Results from Tesla Model 3 MCT test
Attachments: EPA TATD Final EV MCT Calculator_Tesla_Model3_110117-from Will-11-7-2017(djg).xlsx

Will,

I added a few fields to calculate the mpge values and the percent difference from the Tesla mpge & range values.

Here's my doctored up spreadsheet.

Dave

From: Ott, William
Sent: Tuesday, November 07, 2017 2:42 PM
To: Good, David <good.david@epa.gov>
Subject: FW: Results from Tesla Model 3 MCT test

Here is the Tesla Model 3 test data from Nov 1st.

William Ott
Mechanical Engineer, Light-Duty Vehicle Center
Compliance Division
United States Environmental Protection Agency
734 214-4964
ott.william@epa.gov

From: Smithson, Arlene
Sent: Tuesday, November 07, 2017 2:01 PM
To: Ott, William <ott.william@epa.gov>
Subject: Results from Tesla Model 3 MCT test

Hi, Will:

Attached is the summary of the MCT test for the Tesla Vehicle. Please share it with them once you are satisfied with the data since we can not enter the test in Verify and they have to do it themselves. Also want to point out to you that the vehicle trickle charges while plug. According to the SAE guidelines we monitor for 12hrs. the charge and report that number as the energy used for the test. Just for your information the energy without the trickle charge is shown just for your reference. You can let me know if you need additional information. I assume Tesla is interested in getting the vehicle released soon, so from the labs' perspective this was a successful test and no need for retest. If you have further questions let me know.

Yours, Arlene

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 11/22/2017 10:05:35 PM
To: hopsonjl@ornl.gov
CC: Hula, Aaron [Hula.Aaron@epa.gov]; Danzeisen, Karen [Danzeisen.Karen@epa.gov]; French, Roberts [french.roberts@epa.gov]; Zaremski, Sara [zaremski.sara@epa.gov]; Bunker, Amy [Bunker.Amy@epa.gov]; lij1@ornl.gov; flukerjf@ornl.gov; Wehrly, Linc [wehrly.linc@epa.gov]; baindt@ornl.gov; Kenausis, Kristin [Kenausis.Kristin@epa.gov]; Brian West [westbh@ornl.gov]
Subject: RE: 2017 & 2018 FE Guide - Updated datasets attached for the web;
Attachments: 2018 FE Guide for DOE-release dates before 11-23-2017-no-sales-11-22-2017.xlsx; 2018 CT6 Plugin Label Image-rev1-from DebbieZ-10-23-2017.pdf; 2018 Hyundai Ioniq PHEV Monroney Label Draft 20171106-from Brogan B-11-6-2017.pdf; 2017 FE Guide for DOE (EVs only)-release dates before 11-23-2017-no-sales-11-22-2017.xlsx

Janet & all,

Happy Thanksgiving to all.

2017 Web:

There was one new 2017 label (the long-awaited Tesla Model 3 Long Range model) so I attached a file that contains only 2017 EVs----all of the 29 2017 EVs which have been labeled to date. [EPA tested it.]

2018 Web:

Attached is an updated 2018 FE Guide dataset for posting on the web. It is sorted by carline class (as usual). It includes 1143 conventional model types increased from 1127 conventional model types which I sent on Nov 15, 2017. There were two new PHEVs (Cadillac CT6 PHEV and the Hyundai Ioniq PHEV) and so I included a tab for all 17 PHEVs to date. There were no new EVs or FCVs. Also attached are copies of the FE Labels (window stickers) for the two new PHEVs. [Note that there are two label images in the CT6 file but they are identical.]

As usual, please let us know if you find any errors in the attached datasets.

Dave

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 1/10/2017 11:33:32 PM
To: hopsonjl@ornl.gov
CC: Hula, Aaron [Hula.Aaron@epa.gov]; Danzeisen, Karen [Danzeisen.Karen@epa.gov]; French, Roberts [french.roberts@epa.gov]; Zaremski, Sara [zaremski.sara@epa.gov]; Bunker, Amy [Bunker.Amy@epa.gov]; lij1@ornl.gov; flukerjf@ornl.gov; Wehrly, Linc [wehrly.linc@epa.gov]; goeltzrt@ornl.gov; saulsburyjw@ornl.gov; baindt@ornl.gov; Kenausis, Kristin [Kenausis.Kristin@epa.gov]
Subject: RE: 2017 FE Guide - Updated dataset attached for the web;
Attachments: 2017 FE Guide for DOE-release dates before 1-11-2017-no-sales-1-10-2017.xlsx

Janet & all,

2017 Web:

Attached is an updated 2017 FE Guide dataset for posting on the web. It is sorted by carline class (as usual). It includes 1182 conventional model types, increased from 1180 which I sent you on Jan 3, 2016. There were 8 new Tesla EVs and one new PHEV (Prius Prime) so I includes tabs for EVs & PHEVs. [There are still 4 more 2017 Teslas, but they had errors. Hopefully I'll send them next time.

2018 Web:

There are no 2018 vehicles in the EPA database.

As usual, please let us know if you find any errors in the attached datasets.

Thanks

Dave

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 1/3/2018 5:16:15 PM
To: hopsonjl@ornl.gov
CC: Hula, Aaron [Hula.Aaron@epa.gov]; Danzeisen, Karen [Danzeisen.Karen@epa.gov]; French, Roberts [french.roberts@epa.gov]; Zaremski, Sara [zaremski.sara@epa.gov]; Bunker, Amy [Bunker.Amy@epa.gov]; lij1@ornl.gov; flukerjf@ornl.gov; Wehrly, Linc [wehrly.linc@epa.gov]; baindt@ornl.gov; Kenausis, Kristin [Kenausis.Kristin@epa.gov]; Brian West [westbh@ornl.gov]
Subject: RE: 2018 & 2019 FE Guide - Updated datasets attached for the web;
Attachments: 2018 FE Guide for DOE-release dates before 1-4-2018-no-sales-1-2-2018.xlsx; 2017 FE Guide-for DOE (EVs only)-OK to release-no-sales-1-2-2018.xlsx

Janet & all,

Happy New Year to all.

2017 Web:

There were no new 2017 labels, except for one new Tesla EV (Model X 100D AWD) so I included a dataset with 2017 EVs only. There shouldn't be any more 2017 labels (except possibly some corrections and maybe some small volume manufacturers who "forgot" to enter data in EPA's database during the 2017 model year-----like this Tesla model).

2018 Web:

Attached is an updated 2018 FE Guide dataset for posting on the web. It is sorted by carline class (as usual). It includes 1193 conventional model types increased from 1174 conventional model types which I sent on Dec 20, 2017. There was one new PHEV (Mitsubishi Outlander) so I included a tab for all 21 PHEVs to date. There were no new 2018 EVs or FCVs. We'll likely have 7 or 8 new 2018 Tesla models next time, but there is nothing in the EPA database yet.

2019 Web:

There were no 2019 labels in EPA's database.

As usual, please let us know if you find any errors in the attached datasets.

Dave

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 1/10/2017 11:40:08 PM
To: hopsonjl@ornl.gov
CC: Hula, Aaron [Hula.Aaron@epa.gov]; Danzeisen, Karen [Danzeisen.Karen@epa.gov]; French, Roberts [french.roberts@epa.gov]; Zaremski, Sara [zaremski.sara@epa.gov]; Bunker, Amy [Bunker.Amy@epa.gov]; lij1@ornl.gov; flukerjf@ornl.gov; Wehrly, Linc [wehrly.linc@epa.gov]; goeltzrt@ornl.gov; saulsburyjw@ornl.gov; baindt@ornl.gov; Kenausis, Kristin [Kenausis.Kristin@epa.gov]
Subject: RE: 2017 FE Guide - Updated dataset attached for the web; [Resending with Prius Prime FE Label]
Attachments: 2017 Prius Prime Sample Label-from Toyota-10-6-2016.pdf; 2017 FE Guide for DOE-release dates before 1-11-2017-no-sales-1-10-2017.xlsx

Resending with a copy of the 2017 Prius Prime Label.

Dave

From: Good, David
Sent: Tuesday, January 10, 2017 6:33 PM
To: 'hopsonjl@ornl.gov' <hopsonjl@ornl.gov>
Cc: Hula, Aaron <Hula.Aaron@epa.gov>; Danzeisen, Karen <Danzeisen.Karen@epa.gov>; French, Roberts <french.roberts@epa.gov>; Zaremski, Sara <zaremski.sara@epa.gov>; Bunker, Amy <Bunker.Amy@epa.gov>; 'lij1@ornl.gov' <lij1@ornl.gov>; 'flukerjf@ornl.gov' <flukerjf@ornl.gov>; Wehrly, Linc <wehrly.linc@epa.gov>; 'goeltzrt@ornl.gov' <goeltzrt@ornl.gov>; 'saulsburyjw@ornl.gov' <saulsburyjw@ornl.gov>; 'baindt@ornl.gov' <baindt@ornl.gov>; Kenausis, Kristin <Kenausis.Kristin@epa.gov>
Subject: RE: 2017 FE Guide - Updated dataset attached for the web;

Janet & all,

2017 Web:

Attached is an updated 2017 FE Guide dataset for posting on the web. It is sorted by carline class (as usual). It includes 1182 conventional model types, increased from 1180 which I sent you on Jan 3, 2016. There were 8 new Tesla EVs and one new PHEV (Prius Prime) so I includes tabs for EVs & PHEVs. [There are still 4 more 2017 Teslas, but they had errors. Hopefully I'll send them next time.

2018 Web:

There are no 2018 vehicles in the EPA database.

As usual, please let us know if you find any errors in the attached datasets.

Thanks

Dave

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 1/11/2018 9:21:01 PM
To: hopsonjl@ornl.gov
CC: Hula, Aaron [Hula.Aaron@epa.gov]; lij1@ornl.gov; flukerjf@ornl.gov; Brian West [westbh@ornl.gov]; boundyrg@ornl.gov
Subject: RE: 2015, 2016 & 2017 FE Guide Corrections - Updated datasets attached for the web;
Attachments: 2017 FE Guide-corrections for DOE-OK to release-no-sales-1-11-2018.xlsx; 2015 FE Guide-corrections for DOE-OK to release-no-sales-1-11-2018.xlsx; 2016 FE Guide correction for DOE-OK to release-no-sales-1-11-2018.xlsx

Janet,

When you get a chance, please make the attached corrections on the web:

Models	Correction
2015-2017 Mercedes GLA 250	revise carline class from small station wagon to small SUV 2WD
2017 Cadillac XT5 and XT5 AWD	revised to indicate they are equipped with stop-start

I attached 2015, 2016 and 2017 datasets.

Thanks

Dave

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 1/11/2018 12:25:13 AM
To: hopsonjl@ornl.gov
CC: Hula, Aaron [Hula.Aaron@epa.gov]; Danzeisen, Karen [Danzeisen.Karen@epa.gov]; French, Roberts [french.roberts@epa.gov]; Zaremski, Sara [zaremski.sara@epa.gov]; Bunker, Amy [Bunker.Amy@epa.gov]; lij1@ornl.gov; flukerjf@ornl.gov; Wehrly, Linc [wehrly.linc@epa.gov]; baindt@ornl.gov; Kenausis, Kristin [Kenausis.Kristin@epa.gov]; Brian West [westbh@ornl.gov]
Subject: RE: 2018 & 2019 FE Guide - Updated datasets attached for the web;
Attachments: 2018 BMW i3 REX Label-from JohnsonW-1-8-2018.JPG; 2018 BMW i3S REX Label-from JohnsonW-1-8-2018.JPG; 2018 FE Guide-for DOE-release dates before 1-12-2018-no-sales-1-9-2018.xlsx

Janet & all,

2017 Web:

There were no new 2017 labels or corrections.

2018 Web:

Attached is an updated 2018 FE Guide dataset for posting on the web. It is sorted by carline class (as usual). It includes 1195 conventional model types increased from 1193 conventional model types which I sent on Jan 3, 2018. There were two new PHEVs (BMW i3 and i3s PHEVs) so I included a tab for all 23 PHEVs to date. There were 8 new 2018 Teslas, including one Model 3, 4 Model S variants and 3 Model X variants). There were no new FCVs.

I included copies of the FE Labels for the two BMW i3 PHEVs. The Label values are identical for the BMW i3 and the i3s PHEVs. The i3s is a sportier version of the i3 with the following highlights:

- Peak output of the electric motor is 181 HP vs 168 HP; continuous output remains the same
- Wider wheel/tires resulting in higher TRLHP
- Same battery configuration and capacity
- Unique badging

2019 Web:

There were no 2019 labels in EPA's database.

As usual, please let us know if you find any errors in the attached datasets.

Dave

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 1/16/2018 11:01:34 PM
To: hopsonjl@ornl.gov
CC: Hula, Aaron [Hula.Aaron@epa.gov]; Danzeisen, Karen [Danzeisen.Karen@epa.gov]; French, Roberts [french.roberts@epa.gov]; Zaremski, Sara [zaremski.sara@epa.gov]; Bunker, Amy [Bunker.Amy@epa.gov]; lij1@ornl.gov; flukerjf@ornl.gov; Wehrly, Linc [wehrly.linc@epa.gov]; baindt@ornl.gov; Kenausis, Kristin [Kenausis.Kristin@epa.gov]; Brian West [westbh@ornl.gov]
Subject: RE: 2018 & 2019 FE Guide - Updated datasets attached for the web;
Attachments: 2018 FE Guide for DOE-release dates before 1-17-2018-no-sales-1-16-2018.xlsx

Janet & all,

Thanks for posting the eight 2018 Teslas and the two BMW i3 PHEVs.

2018 Web:

Attached is an updated 2018 FE Guide dataset for posting on the web. It is sorted by carline class (as usual). It includes 1204 conventional model types increased from 1195 conventional model types which I sent on Jan 10, 2018. There was one new PHEV (Mercedes C350e) so I included a tab for all 24 PHEVs to date. There were 2 new EVs (BMW i3 and i3s) so I included a tab for all 16 EVs to date. [I should be able to send the 2018 Leaf next time.] There were no new FCVs.

I don't have a copy of the FE Label for the Mercedes C350e PHEV. I forgot to request a copy form Mercedes until 5 minutes ago. I'll send it to you when I get it (likely tomorrow). Sorry about that.

2019 Web:

There were no releasable 2019 labels in EPA's database. [I should have 4 or more 2019s next time.]

Possible Furlough: As you have been reading about in the press, there is a chance that EPA and most U.S. government workers may be furloughed next Monday (1/22/2018) unless Congress passes a continuing resolution for the 2018 budget before then. If we are furloughed, you won't hear from me for a while. Hopefully Congress will work something out. Stay tuned.

As usual, please let us know if you find any errors in the attached datasets.

Dave

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 1/23/2018 6:21:50 PM
To: Yang, Ching-Shih [Yang.Ching-Shih@epa.gov]
Subject: file attached
Attachments: 2018-2019 FE Guide-all rel dates-w-sales-1-23-2018-Portal.csv

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 1/23/2018 9:27:56 PM
To: hopsonjl@ornl.gov
CC: Hula, Aaron [Hula.Aaron@epa.gov]; Danzeisen, Karen [Danzeisen.Karen@epa.gov]; French, Roberts [french.roberts@epa.gov]; Zaremski, Sara [zaremski.sara@epa.gov]; Bunker, Amy [Bunker.Amy@epa.gov]; lij1@ornl.gov; flukerjf@ornl.gov; Wehrly, Linc [wehrly.linc@epa.gov]; baindt@ornl.gov; Kenausis, Kristin [Kenausis.Kristin@epa.gov]; Brian West [westbh@ornl.gov]
Subject: RE: 2018 & 2019 FE Guide - Updated datasets attached for the web;
Attachments: 2018 FE Guide for DOE-release dates before 1-24-2018-no-sales-1-23-2018.xlsx; 2018 Nissan Leaf FE Label-from Farrukh-1-23-2018.pdf; 2019 FE Guide for DOE-release dates before 1-24-2018-no-sales-1-23-2018.xlsx

Janet & all,

Thanks for posting the 2018 Mercedes C350e PHEV and the two 2018 BMW i3 & i3s EVs.

2018 Web:

Attached is an updated 2018 FE Guide dataset for posting on the web. It is sorted by carline class (as usual). It includes 1208 conventional model types increased from 1204 conventional model types which I sent on Jan 16, 2018. There was one new EV (Nissan Leaf) so I included a tab for all 17 EVs to date. There were no new EVs of FCVs.

Attached is a copy of the FE Label for the 2018 Leaf---in case you need it. [The range increased from 107 miles for the 2017 Leaf to 151 miles for the 2018 Leaf.]

2019 Web:

Attached is an updated 2019 FE Guide dataset for posting on the web. It is sorted by carline class (as usual). It includes 4 conventional model types (Jeeps).

As usual, please let us know if you find any errors in the attached datasets.

Dave

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 1/23/2018 5:56:20 PM
To: Yang, Ching-Shih [Yang.Ching-Shih@epa.gov]
Subject: RE: FE Guide Macro 1_23_18 (for 2018 and 19 data).xls
Attachments: 2018-2019 FE Guide-all rel dates-w-sales-1-23-2018-Ann-Fuel cost error.xlsx

Ching-shih,

There's an error in all the 2018 5-year fuel costs.

Dave

From: Yang, Ching-Shih
Sent: Tuesday, January 23, 2018 11:36 AM
To: Good, David <good.david@epa.gov>
Subject: FE Guide Macro 1_23_18 (for 2018 and 19 data).xls

Attached.

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 1/13/2017 8:41:18 PM
To: Schayowitz, Alexis [Alexis.Schayowitz@icf.com]
CC: Kirschner, Lindsay [Lindsay.Kirschner@icf.com]
Subject: RE: Checking In: ILEV Vehicle List
Attachments: 2010-2017 ILEV certificates in EPA database-1-13-2017.xlsx

Alexis,

Attached are all the ILEV certificates from 2010 to 2017 model year as of 1/13/2017.

This list doesn't include all the light-duty vehicle (passenger car) and light-duty truck pure electric vehicles, fuel cell vehicles or dedicated CNG vehicles---because the ILEV standards are out-of-date and not very many manufacturers continue to certify to ILEV emission standards. Some of the missing pure electric, fuel cell and dedicated CNG vehicles (which would likely meet ILEV standards) can be found in the datafiles for each model year at http://www.fueleconomy.gov/feg/download.shtml.

Dave

From: Schayowitz, Alexis [mailto:Alexis.Schayowitz@icf.com]
Sent: Thursday, January 12, 2017 9:29 AM
To: Good, David <good.david@epa.gov>
Cc: Kirschner, Lindsay <Lindsay.Kirschner@icf.com>
Subject: RE: Checking In: ILEV Vehicle List

Hi David,

We had another request for EPA's certified ILEV 2017 MY vehicles. Per your email below, we understand that this is antiquated terminology, but it continues to be an issue for the Florida HOV lane exemption (http://www.afdc.energy.gov/laws/5733), which uses the term "ILEV."

I appreciate your assistance.

Thanks,
Alexis

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From: Good, David [mailto:good.david@epa.gov]
Sent: Tuesday, July 12, 2016 12:37 PM
To: Schayowitz, Alexis
Cc: Jamis, Alex
Subject: RE: Checking In: ILEV Vehicle List

Alexis,

Attached is a list of 2016 model year vehicles which were certified to ILEV standards. As I have discussed with you in the past (when I sent you previous model year ILEV lists), the ILEV standards are meaningless with today's vehicles. For

example Tier 2 and Tier 3 vehicles are much cleaner than vehicles certified to the (obsolete) ILEV emission standards. Most manufacturers don't bother to check the box that their vehicles also meet the (obsolete) ILEV standards. EPA can't delete the (obsolete) ILEV regulations because they are required by the CAA (and until Congress acts, we must keep them on the books).

Never the less, here is the 2016 model year ILEV list. [All of the IMPCO vehicles on the list are alt fuel conversions---not OEM certificates]

Dave

From: Schayowitz, Alexis [mailto:Alexis.Schayowitz@icfi.com]
Sent: Wednesday, July 06, 2016 10:18 AM
To: Good, David <good.david@epa.gov>
Cc: Jamis, Alex <Alex.Jamis@icfi.com>
Subject: Checking In: ILEV Vehicle List

Hi Dave,

I hope you had a nice 4th of July!

I wanted to check to make sure you received my email below. Can you provide an updated list?

Thanks,
Alexis

ALEXIS SCHAYOWITZ | Manager | 617.250.4281 (o) | 203.536.4773 (m) | alexis.schayowitz@icfi.com
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From: Schayowitz, Alexis
Sent: Thursday, June 30, 2016 3:39 PM
To: 'good.david@epa.gov' <good.david@epa.gov>
Cc: Jamis, Alex <Alex.Jamis@icfi.com>
Subject: FW: ILEV Vehicle List

Hi Dave,

It's been a while, but I'm hoping you can provide an updated list of vehicles certified as ILEVs, specifically 2016 models. We received another question to the Clean Cities Technical Response Service on this topic.

Thank you!
Alexis

ALEXIS SCHAYOWITZ | Supporting the U.S. Department of Energy and National Renewable Energy Laboratory
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From: Good, David [mailto:good.david@epa.gov]
Sent: Friday, May 29, 2015 11:00 AM
To: Schayowitz, Alexis <Alexis.Schayowitz@icfi.com>
Cc: Ryder, Carrie <Carrie.Ryder@icfi.com>
Subject: RE: ILEV Vehicle List

Alexis,

Attached is a spreadsheet with all the 2013-2015 certified as ILEVs as of 5/28/2015.

This list doesn't include all the light-duty vehicle (passenger car) and light-duty truck pure electric vehicles, fuel cell vehicles or dedicated CNG vehicles---because the ILEV standards are out-of-date and not very many manufacturers continue to certify to ILEV emission standards. Some of the missing pure electric, fuel cell and dedicated CNG vehicles (which would likely meet ILEV standards) can be found in the datafiles for each model year at http://www.fueleconomy.gov/feg/download.shtml.

Hope this helps.

Dave

From: Good, David
Sent: Thursday, May 28, 2015 1:14 PM
To: 'Schayowitz, Alexis'
Cc: Ryder, Carrie
Subject: RE: ILEV Vehicle List

Alexis,

We'll do an updated query for 2014-2016 ILEV certificates. I'll send it to you in a day or so.

Thanks for including your contact in Florida. After someone from our IT staff does the query I'll try to give him a call---to tell him that ILEV standards are very antique (a very poor way to evaluate a vehicle's emission performance) and that Florida should change their HOV law. Any LEV-II, LEV-III, Tier 2 or Tier 3 light duty vehicle is very much greener than an ILEV vehicle.

Dave

From: Schayowitz, Alexis [mailto:Alexis.Schayowitz@icfi.com]
Sent: Thursday, May 28, 2015 11:46 AM
To: Good, David
Cc: Ryder, Carrie
Subject: ILEV Vehicle List

Hi Dave,

We received an inquiry from Kevin Jacobs, Florida Department of Highway Safety and Motor Vehicles (DHSMV), about the ILEV list we discussed last year (see below and attached). He is wondering if there is any way for Florida DHSMV to access the "back-end" of the EPA Transportation and Air Quality Document Index System and generate updated lists similar to the one you provided attached. If not, can you generate a current list with MY 2016 vehicles? As a reminder, Florida uses this information for their HOV lane program.

We are happy to continue to be the go-between with Mr. Jacobs, but I have included his contact information below in case you would like to reach out directly.
Kevin Jacobs
Florida Highway Safety and Motor Vehicles
850-617-2553
kevinjacobs@flhsmv.gov

Thanks,
Alexis

ALEXIS SCHAYOWITZ | Supporting the U.S. Department of Energy and National Renewable Energy Laboratory
ICF INTERNATIONAL | 617.250.4281 (o) | alexis.schayowitz@icfi.com | 100 Cambridgepark Drive, Cambridge, MA 02140

From: Good, David [mailto:good.david@epa.gov]
Sent: Monday, July 07, 2014 4:46 PM
To: Schayowitz, Alexis
Cc: Jamis, Alex
Subject: RE: Checking In: List of ILEV Vehicles - What model year?

Alexis,

Attached is a spreadsheet containing 2013-15 vehicles certified as ILEVs as of 4/2/2015.

As I've probably explained to you in my emails over the past several years, the ILEV was quite useful in the 1990s (when Congress revised to CAA to adopted them). However, the ILEV program is not very useful today as the ILEV exhaust emission standards are quite obsolete.

We don't have the resources (or see a pressing need) to post a list of ILEV vehicles on line. We post applications for certification and EPA emission certificates on line at http://iaspub.epa.gov/otaqpub/ so consumers can look up their vehicle and determine whether it was certified to ILEV standards or not-----ILEV standards would be listed on the certificate.

Let me know if you would like an updated 2013-2015 ILEV list-----although our IT person who does the query is in vacation this week.

Dave

From: Schayowitz, Alexis [mailto:Alexis.Schayowitz@icfi.com]
Sent: Monday, July 07, 2014 2:40 PM
To: Good, David
Cc: Jamis, Alex
Subject: RE: Checking In: List of ILEV Vehicles - What model year?

Hi Dave,

We continue to get questions about which vehicles qualify as an ILEV under the federal standards. Most of the confusions seems to stem from the Florida High Occupancy Vehicle Decal website (http://www.flhsmv.gov/dmv/hov.html), which directs people to EPA for a list of ILEVs. We have shared the list you provided to us in April with a few Technical Response Service clients, but I was wondering if EPA has any way of posting this information online for public consumption?

Thanks,
Alexis

ALEXIS SCHAYOWITZ | Manager | 617.250.4281 (o) | alexis.schayowitz@icfi.com
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From: Good, David [mailto:good.david@epa.gov]
Sent: Thursday, April 03, 2014 11:10 AM
To: Good, David; Schayowitz, Alexis
Cc: Forni, Sara
Subject: RE: Checking In: List of ILEV Vehicles - What model year?

Alexis,

Attached is a list of the 2013-2015 vehicles which were certified to ILEV emission standards. Emission standards are in column Q. Fuel type is in columns S and W---2013-15 ILEV fuels are only Electricity, CNG, Hydrogen (for hydrogen fuel cell vehicles only).

Hope this helps.

From: Good, David
Sent: Monday, March 31, 2014 5:28 PM
To: 'Schayowitz, Alexis'
Cc: Forni, Sara
Subject: RE: Checking In: List of ILEV Vehicles - What model year?

Alexis,

For 2013 and 2014, for now you can tell the customer that the vehicle must be a dedicated CNG vehicle, such as the Honda CNG vehicles---or a pure electric vehicle.

I'll have our IT person run a query---but she has been on vacation for about 10 days and won't return to work until Wed---so it may take a few days.

No the data isn't really available on the web.

Dave

From: Schayowitz, Alexis [mailto:Alexis.Schayowitz@icfi.com]
Sent: Monday, March 31, 2014 4:49 PM
To: Good, David
Cc: Forni, Sara
Subject: RE: Checking In: List of ILEV Vehicles - What model year?

Thanks, Dave!

I believe the client is looking at purchasing a new vehicle. Can you pull 2013 and 2014 for now? Is the data available to the public anywhere if he wanted other model years?

Thanks,
Alexis

ALEXIS SCHAYOWITZ | Manager | 617.250.4281 (o) | alexis.schayowitz@icfi.com
ICF INTERNATIONAL | 100 Cambridgepark Drive, Cambridge, MA 02140 | icfi.com

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From: Good, David [mailto:good.david@epa.gov]
Sent: Monday, March 31, 2014 4:09 PM
To: Schayowitz, Alexis
Cc: Forni, Sara
Subject: RE: Checking In: List of ILEV Vehicles - What model year?

Alexis,

What model year vehicles do you need? We'll have to do a query to find them.

Thanks

Dave

From: Schayowitz, Alexis [mailto:Alexis.Schayowitz@icfi.com]
Sent: Friday, March 28, 2014 3:05 PM
To: Good, David
Cc: Forni, Sara
Subject: Checking In: List of ILEV Vehicles

Hi David,

I wanted to check in to see if you have any insight into the question below.

Thanks,
Alexis

ALEXIS SCHAYOWITZ | Manager | 617.250.4281 (o) | alexis.schayowitz@icfi.com
ICF INTERNATIONAL | 100 Cambridgepark Drive, Cambridge, MA 02140 | icfi.com

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From: Schayowitz, Alexis
Sent: Friday, March 14, 2014 10:31 AM
To: 'Good, David'
Cc: Forni, Sara
Subject: List of ILEV Vehicles

Hi Dave,

We received a question to the Clean Cities Technical Response Service asking for a list of inherently low-emission vehicle (ILEV)-qualified models. Is this something that you have easily accessible? Looking at the EPA website (http://www.epa.gov/greenvehicle/you/smog.htm), it appears that the current federal (Tier 2) standards use "bin" designations, rather than the ILEV and other categories. I see that you can find the vehicle's bin rating through FuelEconomy.gov. That said, I wanted to make sure we have not missed something here, assuming this gentleman is looking at current vehicles on the market.

It does appear that EPA used the ILEV designation under the Tier 0/1 standards. Do you have a list of vehicles that met that standard when it was applicable?

Thanks in advance your help. Please let me know if I should reach out to someone else within EPA to answer this question.

Thanks,
Alexis

ALEXIS SCHAYOWITZ | Senior Associate | 617.250.4281 (o) | alexis.schayowitz@icfi.com
ICF INTERNATIONAL | 100 Cambridgepark Drive, Cambridge, MA 02140 | icfi.com

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 2/2/2018 12:31:36 AM
To: hopsonjl@ornl.gov
CC: Hula, Aaron [Hula.Aaron@epa.gov]; Danzeisen, Karen [Danzeisen.Karen@epa.gov]; French, Roberts [french.roberts@epa.gov]; Zaremski, Sara [zaremski.sara@epa.gov]; Bunker, Amy [Bunker.Amy@epa.gov]; lij1@ornl.gov; flukerjf@ornl.gov; Wehrly, Linc [wehrly.linc@epa.gov]; baindt@ornl.gov; Kenausis, Kristin [Kenausis.Kristin@epa.gov]; Brian West [westbh@ornl.gov]
Subject: RE: 2018 & 2019 FE Guide - Updated datasets attached for the web;
Attachments: 2019 FEGuide for DOE-release dates before 2-2-2018-no-sales-2-1-2018.xlsx; 2018 FEGuide for DOE-release dates before 2-2-2018-no-sales-2-1-2018.xlsx

Janet & all,

Thanks for posting the 2019 Jeep Cherokees and the 2018 Nissan Leaf.

2018 Web:

Attached is an updated 2018 FE Guide dataset for posting on the web. It is sorted by carline class (as usual). It includes 1214 conventional model types increased from 1208 conventional model types which I sent on Jan 23, 2018. There was one new EV (Volkswagen e-Golf) so I included a tab for all 18 EVs to date. There was one new FCV (Toyota Mirai) but no new PHEVs.

Hopefully, I can include the 2018 Prius Prime PHEV next time.

2019 Web:

Attached is an updated 2019 FE Guide dataset for posting on the web. It is sorted by carline class (as usual). It includes 10 conventional model types increased from 4 conventional model types which I sent on Jan 23, 2018. There were no new 2019 PHEVs, EVs or FCVs.

As usual, please let us know if you find any errors in the attached datasets.

Dave

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 1/17/2017 11:05:44 PM
To: hopsonjl@ornl.gov
CC: Hula, Aaron [Hula.Aaron@epa.gov]; Danzeisen, Karen [Danzeisen.Karen@epa.gov]; French, Roberts [french.roberts@epa.gov]; Zaremski, Sara [zaremski.sara@epa.gov]; Bunker, Amy [Bunker.Amy@epa.gov]; lij1@ornl.gov; flukerjf@ornl.gov; Wehrly, Linc [wehrly.linc@epa.gov]; goeltzrt@ornl.gov; saulsburyjw@ornl.gov; baindt@ornl.gov; Kenausis, Kristin [Kenausis.Kristin@epa.gov]
Subject: RE: 2017 FE Guide - Updated dataset attached for the web; [Resending with Prius Prime FE Label]
Attachments: 2017 FE Guide for DOE-release dates before 1-18-2017-no-sales-1-17-2017.xlsx

Janet & all,

2017 Web:

Attached is an updated 2017 FE Guide dataset for posting on the web. It is sorted by carline class (as usual). It includes 1187 conventional model types, increased from 1182 which I sent you on Jan 10, 2017. There was one new EV (Tesla Model S P90D) so I included a tab for EVs. There were no new PHEVs.

There are still 3 more 2017 Tesla Model S vehicles in the database, but they had errors. Hopefully I'll send them next time.

2018 Web:

There are no 2018 vehicles in the EPA database.

As usual, please let us know if you find any errors in the attached datasets.

Thanks

Dave

Message

From: Good, David [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=6A0A212FAB8644B89798966A2FFF3AB8-GOOD, DAVID]
Sent: 2/1/2017 11:02:47 PM
To: hopsonjl@ornl.gov
CC: Hula, Aaron [Hula.Aaron@epa.gov]; Danzeisen, Karen [Danzeisen.Karen@epa.gov]; French, Roberts [french.roberts@epa.gov]; Zaremski, Sara [zaremski.sara@epa.gov]; Bunker, Amy [Bunker.Amy@epa.gov]; lij1@ornl.gov; flukerjf@ornl.gov; Wehrly, Linc [wehrly.linc@epa.gov]; goeltzrt@ornl.gov; saulsburyjw@ornl.gov; baindt@ornl.gov; Kenausis, Kristin [Kenausis.Kristin@epa.gov]
Subject: RE: 2017 FE Guide - Updated dataset attached for the web;
Attachments: 2017 FE Guide for DOE-release dates before 2-2-2017-no-sales-2-1-2017.xlsx

Janet & all,

2017 Web:

Attached is an updated 2017 FE Guide dataset for posting on the web. It is sorted by carline class (as usual). It includes 1194 conventional model types, increased from 1190 which I sent you on Jan 24, 2017. There was one new EV (2017 Volkswagen e-Golf) so I included a tab for EVs. There were no new PHEVs so I didn't include a tab for them.

The attached dataset doesn't include Mercedes Indexes 435 and 436 (apparent duplicates) which I sent last time----I should be able send them next time (with a descriptor for the G50 4x4 model) along with a different photo for the G50 4x4 model.

2018 Web:

There are no 2018 vehicles in the EPA database which are ready to post on the web.

As usual, please let us know if you find any errors in the attached datasets.

Thanks

Dave