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Air and Radiation Docket
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Washington, DC 20460

To Whom It May Concern:

The National Association of Clean Air Agencies (NACAA) appreciates this opportunity to comment on the U.S. Environmental Protection Agency's (EPA's) and the National Highway Transportation Safety Administration's (NHTSA's) proposal entitled, *Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles*, as published in the *Federal Register* on November 30, 2010 (75 FR 74152). NACAA is the association of air pollution control agencies in 52 states and territories and over 165 metropolitan areas across the nation.

Global warming is one of the most pressing global environmental issues facing our generation. The Intergovernmental Panel on Climate Change (IPCC) stated in 2007 that the evidence that global warming is already affecting our planet is "unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level." And since the IPCC report was released, even more compelling research and evidence have accumulated demonstrating that we need to act now to reduce greenhouse gas (GHG) emissions.

EPA and NHTSA report that in 2007 31 percent of all U.S. greenhouse gas (GHG) emissions were emitted by mobile sources, which, since 1990, have been the fastest-growing source of U.S. GHG emissions. The heavy-duty sector in particular (which, per EPA's definition, applies to "all highway vehicles and engines that are not within the range of light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles covered by the GHG and Corporate Average Fuel Economy standards issued for MY 2012-2016") is the fastest-growing mobile source sector contributor to GHG emissions and was responsible for about 20 percent of all mobile source GHG emissions in 2007 and almost 6 percent of total U.S. GHG emissions. Further, the trucks and buses that comprise this sector – which consume nearly 5 million barrels (over 10 million gallons) of petroleum a day – account for about 17 percent of mobile source petroleum use and 12 percent of all U.S. petroleum consumption.

NACAA, therefore, applauds EPA's and NHTSA's action to propose the first-ever federal program to reduce GHGs from, and improve the fuel economy of, heavy-duty vehicles. This proposal, when added to the federal GHG emissions standards already in place for light-duty vehicles in MYs 2012 to 2016, marks another very commendable step forward in what must be an ongoing effort to make our nation's entire mobile source fleet and fuels as clean and "green" as possible. Moreover, we cannot overstate the critical importance of EPA's role in ensuring the success of the development and adoption of fuel efficiency technologies. The ability of the heavy-duty sector to achieve its full potential in terms of fuel efficiency is directly proportional to progress in meeting rigorous emissions standards. Thus, it is very appropriate that EPA and NHTSA have carefully coordinated this rulemaking to ensure that consumers are able to choose from among the most fuel-efficient and low-polluting heavy-duty vehicles and engines.

The agencies estimate the benefits of this rule over the lifetime of the affected vehicles to include a reduction in oil consumption of more than 500 million barrels or 20 billion gallons, a reduction in carbon dioxide (CO₂) equivalent emissions of 250 million metric tons and total net cost savings for industry as high as \$41 billion. But these are not the only benefits to result from this action. The co-benefits to be derived from such a program extend far beyond climate change and fuel savings, and include the following:

- reduced hydrocarbon emissions due to lower fuel throughput at retail distribution outlets;
- reduced PM_{2.5} and NO_x emissions due to reduced gasoline distribution emissions associated with tanker trucks;
- reduced toxic emissions due to proportional reduction in petroleum refining;
- reduced risk of accidental spills of volatile crude oil due to proportional reduction in oil imports via marine tankers; and
- increased incentives to utilize electric drive train components that provide onroad criteria emissions benefits associated with engine downsizing, combined with zero emission performance for portions of the heavy-duty vehicle duty cycle.

NACAA would like to take this opportunity to offer comments on several issues related to this proposal, including recommendations for several important enhancements that should be included in the final rulemaking.

I. The Stringency of the Emissions Standards for All Three Vehicle Categories Should Be Improved

First and foremost, NACAA strongly supports EPA's proposal to establish GHG emissions standards for three categories of vehicles: 1) Class 2b and 3 vehicles (pick-ups and vans), 2) tractor trailers and 3) vocational vehicles.

One of the most significant aspects of the agencies' proposal is that it is predicated on the application of existing technologies rather than a systematic wide-scale adoption of hybrid technology. While the proposed rulemaking provides an appropriate regulatory baseline for the near term, the second phase of the standards, starting with MY2017, should emphasize the application of hybrid technologies such as electric drive, hydraulic systems, regenerative braking, engine downsizing and the use of batteries and/or ultra-capacitors. A wide range of architectures for electric drive systems is under intense and very competitive development. Electric drive hybridization technology is the most significant opportunity for emission reductions since the introduction of catalysts, unleaded gasoline and low-sulfur diesel fuel. For example, the only means of "recycling" the lost kinetic energy from braking is to utilize regenerative braking systems, which are at the core of virtually all hybridization options. Such "regen" technology represents the equivalent of finding an additional one-half to 1.5 million barrels per day of additional national energy supply, compared to our daily import requirements of over 10 million barrels per day. The use of regenerative braking in heavy-duty applications provides especially significant fuel saving benefits.

Virtually all major truck makers and Tier I system suppliers are developing hybrid electric drive technologies, including Paccar, Peterbilt, Navistar, Volvo, Eaton, Cummins, Siemens, GM, Caterpillar, UQM, Alison, Rexroth Bosch Group, Custom Chassis, Maxwell, Parker, BAE, Cobasys, GE and ISE. The rate of progress in this area is nothing short of stunning: Navistar now has at least six engine/horsepower/torque configurations; Peterbilt has applied such technology to dump trucks, cargo and utility body packages; Freightliner has demonstrated delivery and beverage, buses

and RV platforms; Kenworth has class 7 and 8 hybrid tractors which handle loads up to 55,000 GVW; Eaton has innovative hydraulic system designs, and is applying them cooperatively with the Electric Power Research Institute in Class 5, 6 and 7 applications; and Bosch Rexworth and Parker have parallel and series hydraulic architectures under development. The scope and breadth of hybrid technology innovation is so vast that it cannot be ignored as a foundation for the second phase of the proposed standards for all classes of vehicles and engines. Accordingly, NACAA recommends that EPA enhance the stringency of the standards as follows, based on recent findings from the National Academy of Sciences related to hybrid systems:¹

	EPA Proposal <i>Average Per-Vehicle Reduction</i>	NACAA Proposal
Class 2b and 3 Vehicles	<ul style="list-style-type: none"> • Diesel – 15% (by 2018) • Gasoline – 10% (by 2018) 	<ul style="list-style-type: none"> • 2018 standards by 2016 • 30% reduction by 2018 for gasoline and diesel
Vocational Vehicles	<ul style="list-style-type: none"> • 7–10% (by 2017) 	<ul style="list-style-type: none"> • 13% reduction for entire category
HD Combination Tractors	<ul style="list-style-type: none"> • 20% (by 2017) 	<ul style="list-style-type: none"> • 40% reduction for tractor/trailer combinations by 2018

II. Other Programmatic Recommendations:

a. *Class 2b and 3 Vehicle Certification*

EPA proposes a grams-per-mile (g/mile) fleet average for a manufacturer’s combined fleet of both Class 2b and Class 3 vehicles. NACAA recommends that such fleet standards be bifurcated such that separate fleet average g/mile standards are established for each of these categories.² With respect to certification of vehicles between 8,501 and 14,000 GVW (i.e., both Class 2b and Class 3), NACAA recommends that diesel and gasoline vehicles be subject to full chassis certification, rather than requiring such testing only for gasoline vehicles.³

b. *Standards for Trailers (as part of the tractor trailer combinations proposal)*

NACAA respectfully disagrees with the proposal to forego any standards for trailers. There is a wide range of feasible technologies that can be employed to reduce the energy consumption associated with trailer operation, including improved aerodynamic drag, light-weight materials and low-rolling-resistance tires. EPA’s SmartWay program has extensively documented the wide range of benefits associated with more efficient trailer design.⁴ There are significant aerodynamic benefits of such systems as trailer fairings, side-skirts, nose cones and trailer tails. Single wide tires and aluminum wheels have been demonstrated to reduce weight and rolling resistance. While additional lead time may be required to fully implement such GHG and fuel savings technology options, it is crucial that EPA and NHTSA provide a strong signal to the industry that more efficient trailer design benchmarks are feasible and cost effective. It is also noteworthy that significant industry leadership is already being demonstrated by a wide range of trailer manufacturers, including Great Dane, Trailmobile, Utility, Wabash, Hyundai, Manac, Stoughton and Vanguard. California now requires SmartWay technology certification on all 2011 and subsequent MY sleeper cab tractors if they pull 53-foot or longer box van trailers, while day cab tractors must have SmartWay-approved low-rolling-resistance tires. For trailers,

¹ National Academy of Sciences, “Technologies and Approaches to Reducing the Fuel Consumption of Medium and Heavy Duty Vehicles”, 2010. Also see “Factors and Considerations for Establishing a Fuel Efficiency Regulatory Program for Commercial Medium- and Heavy-Duty Vehicles,” October, 2010, Table II C 5, p. 30, http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/NHTSA_Study_Trucks.pdf

² See p. 74259

³ See footnote 197, p. 74260

⁴ U.S. EPA SmartWay Program, Cheryl Bynum, Annual Tire Industry Conference, April 9, 2010.

http://webcache.googleusercontent.com/search?q=cache:zZ_UpgPe0OsJ:https://odce.clemson.edu/Tire%25202010%2520-%2520Copy/Tire%2520PPTs/r_%2520Bynum%2520SmartWay.ppt+%22smartway+trailers+ppt%22&cd=3&hl=en&ct=clnk&gl=us

California now requires 53-foot or longer van trailers (whether new or in-service) to be SmartWay-certified, or retrofitted with SmartWay-verified aerodynamic and tire technologies, although a phase-in is permitted for 2010 and older MY larger fleets from 2010 to 2015 and for smaller fleets from 2013 to 2016. NACAA therefore recommends that the federal agencies, at a minimum, consider a requirement similar to this California mandate and that rulemaking focused on setting trailer standards should be initiated as soon as possible.

c. Full Chassis Certification for All Vehicles

NACAA agrees with the agencies that full chassis certification is a superior method in principle. However, due to agency resource constraints and current industry capabilities, such full chassis certification is not proposed as part of the rulemaking. NACAA recommends that EPA and NHTSA expedite the development and refinement of full chassis test procedures and require full chassis certification testing for all heavy-duty truck-trailer combinations no later than the 2018 MY, and sooner if feasible.

d. Useful Life Requirements

EPA proposes that Class 7 useful life requirements be substantially shorter than those for Class 8 tractors.⁵ Given the disproportionate impact that highly aged vehicles have on emissions inventories, it is essential that such useful life requirements reflect the latest in-use experience. NACAA therefore recommends that the useful life for Class 7 trucks be increased from 185,000 miles to 250,000 miles (although this is still substantially less than the Class 8 useful life of 435,000 miles).

e. Maximum Speeds Reflected in GEM Model

The GHG Emissions Model (GEM) that the agencies propose for certification should be updated to reflect speeds above 65 miles per hour (mph), up to at least 75 mph. Such speeds are routinely experienced in nonattainment areas in off-peak hours, and contribute to significant NO_x and PM_{2.5} emissions. Raising the maximum steady-state speed parameter in the GEM will provide GHG and fuel savings benefits – by requiring that standards be met over a wider range of speeds – along with important co-benefits associated with criteria pollutant and toxic emissions reductions.

f. Refrigerant Leak-Air Conditioning System Efficiency Standards

The agencies propose a refrigerant leakage standard in terms of percent of total refrigerant leakage per year, in contrast to the credit approach used for light-duty vehicles in which the standard is expressed in terms of absolute grams per year.⁶ An absolute gram-per-year refrigerant leakage standard, at least as stringent as that applicable to light-duty vehicles, is warranted for heavy-duty vehicles and we encourage EPA to take this approach in the final rule. NACAA also recommends that an additional standard be applied for overall air conditioning system efficiency.

g. Fuel Economy-GHG Emissions Labels

NACAA encourages EPA to include provisions for more labeling than is currently required, including some system for providing information and guidance to consumers to enable informed purchase decisions (e.g., OEMs buying engines and chassis to produce complete vehicles). EPA needs to further explore the possibilities for more informative labeling.

⁵ 185,000 miles compared to 435,000; see p. 74270.

⁶ See p. 74163.

h. Credits for Advanced Fuels

NACAA supports the targeted Advanced Technology Credits being proposed for heavy-duty vehicles and engines.⁷ NACAA believes that these credits should be expanded to include a wider range of important technology and alternative fuel options, such as the following:

- Plug-in electric hybrid designs;
- Advanced electric drive hybrid designs without energy storage;
- Hydraulic hybrid systems;
- Compressed natural gas;
- Liquefied natural gas;
- Bio-methane;
- 2nd generation ethanol;
- Other bio-alcohols such as methanol;
- CO₂-based liquid fuels produced from renewable feed stocks;
- Advanced bio-butanol;
- 2nd generation renewable (i.e., non-oxygenated) diesel fuels; and
- Atkinson cycle engines.

The use of all of these advanced technology and alternative fuel options, as well as the list of currently proposed technologies, could result in significant reductions in petroleum fuel use as well as GHG, criteria and toxic emissions. It is therefore appropriate that we provide incentives for their development and commercialization. An expansion of such credits is directly consistent with – and indeed flows directly from – the vision expressed by President Obama in his January 25, 2011, State of the Union address regarding the nation’s “Sputnik Moment” and the need to expedite renewable and clean energy options.

i. Final Rule by July 2011

NACAA urges that EPA and NHTSA ensure that this final rule is promulgated by July 2011, as planned. Numerous states across the nation have developed climate action plans with GHG reduction targets of 80 percent by 2050 and interim goals for 2020, and have adopted an array of measures to achieve these goals, including programs to reduce power plant emissions, California’s light-duty vehicle GHG standards and the Zero Emissions Vehicle (ZEV) program. States are also working to reduce truck, locomotive and passenger car idling and vehicle miles traveled and to establish an infrastructure and incentives for ZEVs, as they continue to evaluate further strategies to reduce GHG emissions from mobile and stationary sources. The benefits that will result from final adoption of effective federal standards for heavy- and medium-duty GHG emissions are critically important to states and localities.

In November 26, 2009, comments to EPA and NHTSA on the agencies’ joint proposal to establish light-duty vehicle GHG emissions standards and corporate average fuel economy standards for light-duty vehicles, NACAA encouraged EPA to develop and enforce GHG standards for all key vehicle, engine and equipment subsectors within the overall transportation sector. We placed special emphasis on onroad heavy-duty engines, and advocated for the development of federal regulations, in close cooperation with the states, without delay. As noted above, states are keenly aware of the pressing environmental need to garner GHG emissions reductions from onroad heavy-duty engines. In the absence of federal action, states will be pressed to move ahead using other authorities under the Clean Air Act so that emissions reductions from this sector can be achieved as soon as possible.

⁷ See p. 74255. The proposed credits are limited to the following: hybrid powertrain designs that include energy storage systems, Rankine cycle engines, all-electric vehicles and fuel cell vehicles.

We recognize that several states are currently involved in litigation concerning the federal regulation of GHG emissions. NACAA is pleased to provide these technical comments on EPA's proposed *Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles* to ensure that the final rule is appropriately rigorous and will best achieve our nation's long-term mobile source goals.

Thank you for the opportunity to comment. If you have any questions, please feel free to contact either of us or Nancy Kruger, NACAA's Deputy Director, at 202-624-7864.

Sincerely,



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