

November 25, 2009

U.S. Environmental Protection Agency
EPA Docket Center (EPA/DC)
Air and Radiation Docket
Attention Docket ID No. EPA-HQ-OAR-2009-0472
Mail Code 2822T
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Dear Docket:

On behalf of the Northeast States for Coordinated Air Use Management (NESCAUM) I am providing comments regarding the U.S. Environmental Protection Agency (EPA) and U.S. Department of Transportation (DOT) joint *Proposed Rulemaking To Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards* (74 FR 49454-49789). NESCAUM is an association of the state air pollution control programs in the eight northeast states including: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont. NESCAUM supports the joint EPA and DOT proposal and commends the agencies for taking this critical step in controlling light duty vehicle greenhouse gas (GHG) emissions and fuel consumption.

The need for action on climate change is no longer in dispute: the international scientific community, under the auspices of the Intergovernmental Panel on Climate Change (IPCC), has concluded, "*Observational evidence from all continents and most oceans shows that many natural systems are being affected by regional climate changes, particularly temperature increases.*"¹ We believe the science reveals that the onset of climate change-related threats is already affecting our member states, this nation, and the globe.

We are faced with the need to reduce 80 percent of GHG emissions by 2050 if we are to stabilize the earth's climate at a 2.0 to 2.4 degree C global average temperature increase over today's average temperature.² It is a reasonable assumption that in order to reach the 80 percent goal, deep reductions will need to be made across all sectors – including both mobile and stationary sources. This goal cannot be achieved without major reductions from all mobile source sectors. Mobile source reductions must be achieved

¹ IPCC, Summary for Policymakers. 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 (2007).

² IPCC, *Climate Change 2007 Synthesis Report*, November, 2007

from today's emissions levels, and must be over and above increases that result from growth in mobile source fleets and activity.

According to EPA, mobile sources accounted for 29 percent of total U.S. GHG emissions in 2006. It is also the fastest growing source of U.S. GHGs, having increased by 47 percent since 1990. It is the largest collective end-use source of carbon dioxide emissions among U.S. source sectors, and its share is even higher when considering full lifecycle emissions associated with motor vehicles, such as extraction and refining of fuel, and vehicle manufacturing.³

Thus, NESCAUM applauds EPA for taking an extremely important step towards reducing transportation-related GHG emissions. The proposed rule, once implemented, will reduce light-duty vehicle GHG emissions 21 percent by 2030. The rule will also increase energy security — the U.S. currently consumes more than 18 million barrels of oil a day, and imports about 60 percent of total consumption. Of this, more than 8 million barrels a day are consumed in light-duty vehicles.⁴ The rule will reduce oil consumption by approximately 1.8 billion barrels over the lifetime of the vehicles that will be sold in model years 2012 to 2016.

As NESCAUM stated in our comments on EPA's "Regulating Greenhouse Gases Under the Clean Air Act - Advance Notice of Proposed Rulemaking" (73 FR 44354-44520), NESCAUM believes the Clean Air Act is an appropriate mechanism for regulating GHG emissions. The regulation of light-duty vehicle GHG emissions fits squarely in the purview of the agency's mission. And given the agency's decades-long experience in regulating motor vehicle emissions it is well suited to implement and enforce motor vehicle GHG standards.

Technical Feasibility of the Standards:

NESCAUM supports the proposed emissions standards as technically feasible and cost effective in the timeframe proposed. In 2004, NESCAUM's sister organization, NESCCAF, conducted a comprehensive study on the technical feasibility and costs of reducing light-duty vehicle GHG emissions.⁵ The study found that there are commercialized technologies such as turbocharging and downsizing, variable valve timing and lift, and gasoline direct injection which provide substantial GHG reductions while maintaining the performance of vehicles. Examples of performance measures are 0-60 mph acceleration and towing capacity. These and other available and cost effective technologies will likely be used by manufacturers to meet the standards proposed by EPA and DOT. The NESCCAF study also concluded that greater use of these commercially available technologies will save consumers money because lower monthly fuel costs will more than make up for the somewhat higher monthly car payment.

³ EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007*, April, 2009

⁴ Energy Information Agency Annual Energy Outlook 2009: [http://www.eia.doe.gov/oiaf/aeo/pdf/0383\(2009\).pdf](http://www.eia.doe.gov/oiaf/aeo/pdf/0383(2009).pdf)

⁵ NESCCAF, *Reducing Greenhouse Gas Emissions From Light-Duty Motor Vehicles*, 2004, <http://www.nescaum.org/focus-areas/mobile-sources/mobile-sources-documents>

Since the 2004 NESCCAF study, EPA has conducted several additional important technology and cost assessments that form part of the basis of the standards being proposed in the NPRM. The first was a study done by Ricardo and was entitled “A Study of Potential Effectiveness of Carbon Dioxide Reducing Vehicle Technologies.” In this analysis, EPA and Ricardo developed a comprehensive list of technologies to be modeled and then conducted simulation modeling to assess combinations of technologies. As part of this effort, EPA surveyed numerous powertrain and vehicle technologies and technology trends in order to assess their feasibility over the next ten years. The Ricardo study provides a robust, science-based analysis which characterizes the consequences of combining multiple technologies for efficiency gains. Importantly, an assessment of impacts on performance such as grade capability and passing performance was also included. The analysis was comprehensively done, yielded robust results, and the conclusions support the level of stringency being proposed in this NPRM.

With regard to additional cost assessments, EPA has contracted with FEV to do four or five complete systems tear downs to evaluate individual components for different technologies. The goal of the tear down evaluations is to develop very detailed estimates of costs associated with manufacturing the technologies. To date, FEV has completed one of the tear downs – on a turbocharged and downsized engine. This information has been included in the NPRM cost analysis. Other information – including additional engine and transmission data which became available shortly before the release of the NPRM but which was not included in the agency’s cost analysis -- is now becoming available. We urge the agency to include the additional transmission data discussed in the TSD, but not included in the agency’s analysis, as well as any other information from the tear down analyses in the final rule. These analyses provide very detailed and useful information that should be included in the final rule.

In addition, in order to address concerns about the inclusion of indirect costs in commonly used retail price equivalent (RPE) factors, EPA contracted with RTI International and the University of Michigan Transportation Research Institute to provide a current estimate of the RPE multiplier. The report also examines whether the indirect costs of new technologies are likely to vary across technologies. This analysis and its findings were peer reviewed and summarized in a report entitled “Automobile Industry Retail Price Equivalent and Indirect Cost Multipliers” which was published in 2009. This evaluation adds significantly to the literature on this subject and should be included in any future evaluation of GHG reducing technology costs. We urge the agency to include this study in its evaluation of costs associated with this rule.

Consumer Choice

EPA has crafted the proposal in a way that ensures consumers will continue to have the variety and choice in vehicle models they have come to expect. The size-based standard provides manufacturers with significant flexibility in meeting the proposed GHG reductions. Furthermore, as mentioned above, technologies to reduce vehicle GHG emissions exist in the market today. The phase-in of the standards between 2012 and 2016 allows manufacturers six years to incorporate these technologies into greater numbers of vehicles.

Safety

In its regulatory impact statement, EPA estimates that vehicle manufacturers will reduce the weight of their vehicles by approximately four percent on average between 2011 and 2016. The safety analysis presented by National Highway Traffic Safety Administration (NHTSA) in Section IV of the preamble was based on a thorough review of historical data regarding the relationship between mass reduction, wheel base, track width, and fatality risk published in 2003 by Dr. Charles Kahane. Dr. Kahane concluded that a heavier vehicle is safer than a lighter one based on the assumption that vehicle mass reductions are accompanied with vehicle size and footprint reductions. The study did not evaluate vehicle mass reductions that are not accompanied by vehicle size reductions.

A study conducted by Dynamic Research Incorporated (DRI) in 2005 did assess the independent effects of vehicle weight and size on safety in order to determine if there are tradeoffs between improving vehicle safety and fuel consumption.^{6,7} This study was published by the Society of Automotive Engineers and was peer reviewed prior to publication. The results of that study indicate that vehicle weight reduction tends to decrease fatalities, but vehicle wheelbase and track reduction tends to increase fatalities. The DRI analysis concluded that there would be small additional reductions in fatalities for cars and trucks if the weight reduction occurs without accompanying vehicle footprint or size changes.

Vehicle mass can be reduced without reducing the size, footprint, or structural integrity of the vehicle. A number of approaches such as material substitution – the substitution of higher strength steel, aluminum, magnesium, or composite materials in components currently fabricated from steel -- can decrease weight and maintain structural integrity and crashworthiness relative to previous designs while providing a net decrease in component weight. The DOT and EPA have taken two measures to help ensure that the proposed rule provide no incentive for mass reduction to be accompanied by a corresponding decrease in the footprint of the vehicle – which can decrease crush and crumple zones. One of these measures includes the establishment of the footprint-based standard. In fact, EPA projects that automakers will not reduce vehicle footprints in order to meet the proposed CO₂ standards.

NESCAUM requests that DOT include the DRI study in its evaluation of safety issues associated with this rule.

Form of the Standard:

NESCAUM concurs with and supports the EPA and DOT decision to use an attribute-based standard rather than an industry-wide average standard.

⁶ M. Van Auken and J. Zellner, Dynamic Research, Inc. *An Assessment of the Effects of Vehicle Weight and Size on Fatality Risk in 1985 to 1998 Model Year Passenger Cars and 1985 to 1997 Model Year* Society of Automotive Engineers Technical Paper 2005-01-1354

⁷ Dynamic Research, Inc. *Supplemental Results on the Independent Effects of Curb Weight, Wheelbase and Track on Fatality Risk*, DRI-TR-05-01, May 2005

Footprint-based standard: NESCAUM agrees with EPA's approach to regulate vehicle footprint. Consistent with the model year 2011 CAFE standards, EPA and DOT are proposing to use footprint as the attribute for the model year 2012-2016 CAFE standards and CO₂ emissions standards. Footprint-based standards provide an incentive to use new and advanced lightweight materials and structures that could otherwise be discouraged by weight-based standards. Manufacturers can use them to improve a vehicle's fuel economy without necessarily resulting in a change in the vehicle's target level of fuel economy or CO₂ emissions and without a substantial impact on the safety (in terms of crashworthiness) of that vehicle.

Separate footprint curves for cars and light trucks: NESCAUM encourages EPA and DOT to maintain a single footprint curve for cars and light trucks in the final regulation. By establishing two curves as EPA and DOT have proposed, there is a significant risk that automobile manufacturers will "game" the standard. This can be done, for example, by making four wheel drive small SUVs rather than two wheel drive small SUVs so that cars become classified as trucks. If manufacturers reclassify cars as light trucks as has happened before, GHG emissions and fuel consumption could increase significantly.

Establishing a Backstop for the GHG Standards:

NESCAUM urges EPA and DOT to include a backstop mechanism for the standards. The shift in the market away from cars towards light trucks in the 1990s resulted in a decrease in the U.S. fleet average fuel economy. More recently, there has been a dramatic shift in the market towards 4 and 6 cylinder engines and away from 8 cylinder engines. This has been accompanied by a shift away from larger trucks and towards smaller trucks and cars. The technical analysis conducted for this proposal by EPA and DOT assumes that this trend will continue. Should there be a shift back toward higher CO₂ emitting vehicles (as was the case in the 1990s) the emissions reductions projected by the agency could be greatly overestimated. A backstop which sets a floor for reductions would address this potential problem. NESCAUM also urges the agencies to revisit the GHG standards and incorporate changes in the light-duty vehicle fleet into baseline assumptions. NESCAUM believes this is an important element to include in the final rule. We encourage the agencies to revisit and revise the light-duty GHG standards to correct for mistaken future projections.

Advanced Technology Vehicle Credits:

EPA has proposed to allow manufacturers to receive additional credits for the placement of advanced technology vehicles, including pure electric vehicles, fuel cell vehicles, and plug-in hybrid electric vehicles. NESCAUM is concerned that the preferential crediting proposed by EPA may be too generous by assuming a zero (0) grams per mile CO₂ equivalent for vehicles powered by electricity. While we strongly support incentives for the introduction of advanced technology vehicles, we are concerned that the magnitude of credits being offered for these vehicles may unnecessarily weaken the overall effectiveness of the proposed standards. We encourage EPA to re-evaluate its advanced technology vehicle credits to ensure an appropriate level of credit is provided by considering the whole vehicle, e.g., vehicle technology and fuel system. A number of studies are available to assist the agency in developing assumptions for the

CO₂ resulting from electricity generation as are models (such as GREET) to estimate upstream emissions.

With regard to the multiplier EPA has proposed for advanced technology vehicles, NESCAUM urges the agencies to establish a multiplier at the lower end of the range proposed in this rulemaking. A multiplier of 2.0 could result in erosion of the GHG standards and fleet average GHG emissions significantly greater than 250 grams per mile. A multiplier on the low end of what EPA has proposed and ramping down to 1 by 2016 could provide incentives for manufacturers to place electric vehicles but would pose less of a risk of eroding the overall standards than will the higher multiplier.

Pollutants included in Proposal:

NESCAUM commends EPA for proposing to regulate nitrous oxide, methane, and hydrofluorocarbons in addition to CO₂. These gases have very high global warming potential and as such should be regulated in addition to CO₂. Carbon dioxide represents 95 percent of global warming emissions from light-duty vehicles, but nitrous oxide, hydrofluorocarbons, and methane are potent greenhouse gases, and thus it is appropriate that these gases should be controlled in addition to CO₂. EPA's ability to regulate GHG emissions from all aspects of vehicle operation and all vehicle-related pollutants will maximize reductions from the national program. We ask, however, that the agency include other pollutants in the final rule such as black carbon which is a potent greenhouse forcing agent. Ozone is also a greenhouse gas, and while the pollutants that contribute to ozone are regulated under the Tier 2 program, there should be a mechanism to quantify the impact of ozone on global warming and to require more stringent standards if it is deemed necessary. At a minimum, we ask the agency to establish a mechanism to evaluate and include additional pollutants as scientific understanding of climate forcing agents evolves.

Cost of Carbon:

We find that EPA's treatment of the economic benefits of avoided CO₂ emissions in this proposal to be inadequate. Specifically, the use in this proposal of a social cost of carbon of \$20 per metric ton and a 3-percent discount rate requires both further explanation of this value and a presentation of alternative values. Best practices in economic analysis for federal regulatory programs require full transparency and explicit treatment of uncertainties surrounding estimates of costs and benefits. EPA's choice of the \$20 per metric ton value from the stated range of \$5 to \$56 without further discussion of the rationale for this choice, and for rejection of alternative values in the literature, appears to violate both of these principles. For example, some published studies (e.g., Stern 2006) suggest that the economic value of damages associated with GHG emissions (or conversely, the benefits of avoided GHG emissions) are significantly higher than this estimate, and may in fact be orders of magnitude higher than \$20 per metric ton. Moreover, the use of such an estimate ignores recent scientific literature indicating the potential for climate change to result in severe, non-linear impacts on ecological systems and services. Given the high level of uncertainty associated with the range of potential damages to ecological and human health as well the challenges associated with quantifying and modifying the benefits of avoided

climate change, we urge EPA to provide a much fuller treatment of these issues and their effect on estimates of avoided CO2 emissions, and to present a broader range of benefit estimates that reflect these uncertainties.

Establishment of Future More Stringent GHG Standards Beyond 2016:

NESCAUM is very supportive of the proposed federal vehicle control program as a powerful first step in addressing GHG emissions from motor vehicles. However, additional reductions will be needed for vehicles beyond model year 2016. NESCAUM is committed to working with the EPA, NHTSA, the California Air Resources Board, and other stakeholders to address global climate change and the need to reduce oil consumption by developing strong motor vehicle GHG standards for model years after 2016. These additional reductions will be critical for the states in the Northeast to achieve their 2020 and 2050 GHG goals.

Through the Clean Air Act, Congress wisely allowed California's authority to control motor vehicle emissions to remain in place. And as an alternative to multiple independent programs, Congress also allowed other states to adopt California's regulatory program under Section 177 of the Act. This combination of California's ability and willingness to address the threat posed by motor vehicle GHG emissions and the market pressure exerted by Section 177 states has now led us to the beginnings of a comprehensive federal program to control the GHG emissions from motor vehicles. This proposal provides a clear indication of the extraordinary value of the authority given California in Section 209 of the Clean Air Act to adopt more protective motor vehicle emissions standards, and the authority given other states by section 177 of the Act to adopt those standards. As in previous cases that have come before, the states have acted as a laboratory in the development of emissions reduction programs that could then be applied on a broader scale. In light of this successful track record, future federal programs should not preempt the states from establishing appropriate GHG reduction programs, including additional motor vehicle programs as they are provided for by federal law.

We thank the agencies for the opportunity to comment on this proposal.

Very truly yours,



Arthur N. Marin
Executive Director

Cc: NESCAUM Directors
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