

**STATEMENT OF THE
ADVANCED ENGINE SYSTEMS INSTITUTE
ON THE PROPOSAL BY THE U.S. ENVIRONMENTAL PROTECTION
AGENCY AND THE NATIONAL HIGHWAY TRAFFIC SAFETY
ADMINISTRATION TO SET PERFORMANCE STANDARDS FOR
GREENHOUSE GAS EMISSIONS FROM MEDIUM- AND HEAVY-DUTY
VEHICLES - PHASE 2
DOCKET ID NO. EPA-HQ-OAR-2014-0827; NHTSA-2014-0132**

The Advanced Engine Systems Institute (AESI) is pleased to provide comments on the agencies' proposal to set more stringent greenhouse gas standards for medium- and heavy-duty vehicles.

AESI represents several emissions control manufacturers in an industry employing more than 65,000 people in the U.S. For more than 40 years, the emissions control industry has been working with vehicle manufacturers - our primary customers - and the regulators to develop technologies to reduce harmful criteria pollution in the most cost-effective ways possible. Increasingly, our members companies' and the industry's focus is on applying that track record of success and experience to increasing the energy efficiency of vehicles and reducing carbon pollution.

The industry's many innovations developed and deployed in the U.S., in response to science-driven air quality regulations, have reduced pollution from cars and trucks by more than 75% since 1975. This has occurred even while vehicle miles traveled increased 300%, driving economic growth forward and significantly enhancing mobility.

We would like to commend the Agency and the President for going beyond the public health and environmental impacts of criteria pollutants like particulate matter (PM) and nitrogen oxides (NO_x) to aggressively tackle the grave risks associated with greenhouse gas and black carbon emissions. Carbon pollution from the U.S. transportation sector, especially medium- and heavy-duty vehicles, is a very significant contributor to global atmospheric concentrations and the Phase 2 proposal will help reduce that pollution substantially and limit emissions growth from the sector that will otherwise rise through 2040.

AESI is pleased that the Agency has proposed to retain the basic regulatory structure used in Phase 1, including a separate engine standard and similar testing and certification procedures. Our industry has invested heavily in research and systems to deliver cost-effective greenhouse gas reductions to meet the Phase 1 schedule while meeting the 2010 standards for NO_x and PM. Retaining a separate engine standard with the appropriate compliance enforcement will help ensure the long term environmental integrity of the program.

AESI strongly supports setting a final Phase 2 greenhouse gas standard that will strongly encourage innovative companies to develop new technologies and systems that can help medium- and heavy-duty vehicle and engine makers to quickly, cost-effectively, and reliably reduce or eliminate carbon pollution and still overperform on criteria pollutants. We appreciate the delicate balance that the agencies must consider between setting an engine standard that appears feasible using technology available now or in the very near term and under current fuel price conditions versus setting a slightly more stringent technology driving standard that will prompt even faster evolution and greater consumer savings in the long run.

There appears to be ample evidence to indicate that, of the options considered by the agencies, Alternative 4's timeline comes closest to striking the right balance **though it does appear greater reductions than the 4.2% in the proposal could well be feasible now and still be quite cost-effective.** There are now a multitude of technologies, including waste heat recovery, turbo-compounding, advanced downspeeding, hybridization, etc. that can be ready to deploy in the Alternative 4 timeframe or sooner at still reasonable cost, provided the right policy or market signal and some combination of incentives or credits. EPA may want to consider whether such incentives or credits, particularly in an era of low fuel prices, might expedite the development and commercialization of these technologies and promote earlier and more cost-effective achievement of the program goals. If the Agency chooses not to adopt a technology-driving engine standard in this rulemaking cycle, it may make sense to have the final rule incorporate a Mid-term Review or evaluation of engine related technologies in the not too distant future so the standards can be adjusted and updated to keep pace with innovation and the growing need to reduce carbon emissions.

Our members have been working with the Department of Energy's Super Truck program to demonstrate the magnitude of carbon dioxide reductions that engine and vehicle technologies can deliver while improving criteria pollution control systems. From this advanced research and development program as well as the independent investment our companies are making with EPA and the California Air Resources Board at the Southwest Research Institute, we are increasingly confident that there is a fuel economy/greenhouse gas optimization "bonus" to be realized from integrating rapidly emerging and cost-effective NOx control strategies into heavy-duty manufacturers' engines and powertrain designs.

There no longer needs to be the once evident tradeoff between engine efficiency and tailpipe NOx emissions. The presentation attached (attachment 1) illustrates many of the newest NOx and GHG reducing technologies and the continually declining NOx emissions rates of the more recent and more efficient engine certifications. Basically, as engine manufacturers have been, with the able assistance of AESI companies, certifying their engines to tighter criteria pollutant standards and simultaneously integrating carbon emissions reduction as a design priority, both categories of pollution have been dropping. However, without the appropriate policy signal, the newest and most promising NOx control technologies may not manifest on the right timescale to comport with the Phase 2 proposal and thus could leave significant fuel economy gains until a future time.

Because California, as well as other states, continues and will continue to have very serious ozone nonattainment problems due mainly to NOx pollution from vehicles, that state is seriously considering an additional 90% reduction in NOx emissions beyond the 2010 standards for medium and heavy duty vehicles. Should that state, states in the Ozone Transport Commission region or the Northeast, or EPA, choose to formally adopt that standard, AESI members will work very hard with our customers to ensure that that standard can be achieved and to realize the optimization "bonus" that would make fuel economy/greenhouse gas targets easier to achieve.

AESI supports the Agency's efforts to tighten the nitrous oxide (N₂O) cap to ensure that efficiency enhancements made by engine manufacturers to reduce carbon dioxide pollution do not lead to unintended increases of this other potent greenhouse gas. The changes in engine technology to meet Phase 2 overall, particularly the great likelihood that the new more efficient engines will produce a higher volume of nitrogen oxides, will make meeting that new N₂O cap challenging. Our members are working now on the cutting edge materials necessary to limit N₂O formation.

Finally, though the agencies' proposal does not seek to place limits on black carbon emissions from medium- or heavy-duty vehicles or engines, it is worth noting that the global warming potential of this pollutant is very significant, particularly in the short term. According to EPA's 2012 report to Congress on black carbon, the pollutant's 20-year global warming potential could be around 4,470 times that of carbon dioxide. While existing EPA vehicle regulations are on track over the next two decades to gradually reduce particulate matter pollution, a sizable fraction of which is black carbon, EPA could shrink heavy-duty vehicles' and engines' carbon footprint almost immediately and very cost effectively by application of high-efficiency diesel particulate filters that eliminate 99.9% of black carbon emissions. The Agency may want to consider incentives in the final rule for the rapid installation of such filters on vehicles/engines not already required to have them.

AESI appreciates the opportunity to comment on the proposed rule and looks forward to working with the Agency, OMB and others to implement a final rule that maximizes vehicle efficiency as well as pollution reduction and drives the market for innovative technology development.