

March 13, 2019

The Hon. John Barrasso  
Chair  
Senate Committee on Environment and Public  
Works  
410 Dirksen Senate Office Building  
Washington, D.C. 20510

The Hon. Tom Carper  
Ranking Member  
Senate Committee on Environment and Public  
Works  
456 Dirksen Senate Office Building  
Washington, D.C. 20510

Dear Chairman Barrasso and Ranking Member Carper:

On behalf of the Diesel Technology Forum, I would like to submit the following statement for the record and the hearing concerning the Diesel Emission Reduction Act (DERA).

In Summary

- DERA is an unquestioned and well documented bipartisan success story. Over 73,000 vehicles, engines and pieces of equipment have been replaced or retrofitted thanks to the DERA program. Substantial clean air benefits and greenhouse gas reductions have been achieved and documented.
- The program has delivered significant emission reduction benefits to communities across the country, largely through the use of advanced technology new diesel engines and retrofitted emissions control technology. Every dollar invested in diesel retrofits and replacements yields at least \$13 in environmental and public health benefits.
- While funding has been appropriated for DERA activities since 2008, there is still continuing need for the program, to address the many older vehicles, engines and equipment still operating today, and likely for years to come. In the trucking sector, 36 percent of all large trucks are of the newest generation of near-zero emissions performance, meaning that 64 percent are of an older generation of technology.
- Substantial opportunities for emissions improvements still exist in communities all around the country.

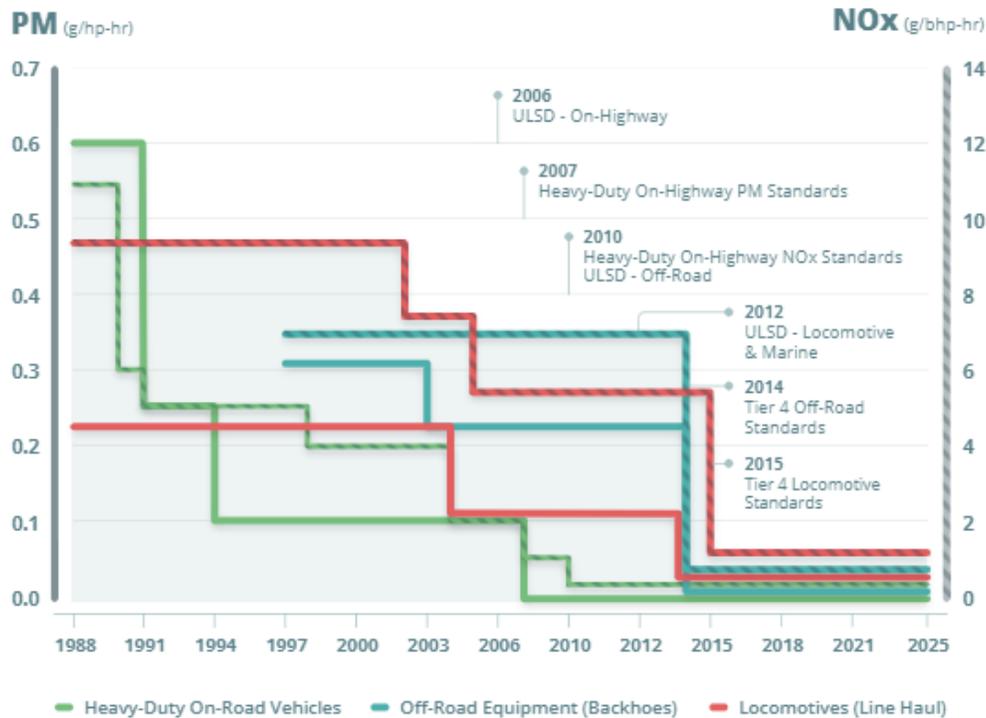
By way of background, the Diesel Technology Forum represents the manufacturers of diesel engines, vehicles and equipment, including passenger vehicles, larger commercial trucks and buses and even larger pieces of off-road equipment, locomotives and stationary engines. The Forum serves as a not-for-profit educational and advocacy organization dedicated to raising awareness of the clean air and economic benefits of diesel engines, vehicles and equipment, along with cleaner diesel fuel including biodiesel and renewable diesel fuel. More information is available at [www.dieselforum.org](http://www.dieselforum.org).

**I. NEW DIESEL ENGINES ARE NEAR-ZERO IN EMISSIONS**

These last ten years have been called the decade of clean diesel: a system of cleaner engines, cleaner fuels, and advanced emissions control technologies are now deployed across all ranges and types of diesel-powered vehicles, equipment and machines. The results are clear, new highway diesel truck engines have near-zero emissions of particulate matter and oxides of nitrogen (NOx), 98 percent less than 1988 models. It is noteworthy that truck and engine manufacturers are not only producing near-zero level emissions vehicles, but these vehicles are consuming less fuel. Due to the first ever fuel economy rules for commercial vehicles, EPA estimates that between 2014 and 2018, more fuel-efficient trucks will save 530 million barrels of crude oil, reduce 270 million tons of greenhouse gas emissions, while also saving vehicle owners millions in fuel costs.<sup>1</sup> These are advancements that allow the fuel sipping diesel engine to use even less fuel while reducing emissions.



# PROGRESS TO NEAR-ZERO PM & NOx EMISSIONS



<sup>1</sup> <https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-phase-1-greenhouse-gas-emissions-standards-and>

The new generation of clean diesel technology is not only meeting its emissions reduction targets but is also exceeding them. A jointly funded government and industry research effort known as the Advanced Combustion Emissions Study (ACES), carried out through the Health Effects Institute and Coordinating Research Council, evaluated the performance of large diesel engines that power a Class 8 truck that come with technology to meet the model year 2010 emissions standard. Phase 1 of that study determined that fine particle emissions generated from these truck engines were lower than the standard required of them, while the second phase of the research determined that there were no adverse health outcomes due to exposure from the exhaust from these engines.<sup>2</sup>

Similar reductions in emissions of particulates and oxides of nitrogen are now required of the wide range of off-road engines that power everything from small construction equipment and farm machinery to freight locomotives, marine vessels and work boats. Beginning in 2014, newly manufactured off-road equipment must meet the Tier 4 emissions standards while larger engines that power marine vessels, locomotives and other large applications must meet these standards beginning in 2015.

## **II. MODERNIZING AND UPGRADING EXISTING ENGINES AND EQUIPMENT**

Diesel engines are known for their durability and reliability. Customers who purchase these technologies value these traits, and it is not unusual to see 10 or 15-year-old construction machines, agricultural equipment or commercial trucks. In the course of developing cleaner diesel engines and fuels, it became clear that some technologies could be deployed on existing vehicles and equipment which would enable current truck, bus or machine owners to improve the environmental footprint of their equipment while enhancing its overall value.

DERA is an important tool to help incentivize the introduction of the latest clean diesel technologies across all applications to help meet the needs of vehicle and equipment owners, while delivering real emission reduction benefits for the communities in which they serve. According to the latest report to Congress, EPA estimates that between 2008 and 2013 the program has retrofitted or replaced over 73,000 vehicles, equipment and engines to deliver over 335,000 tons of NOx emission reductions and 14,700 tons of fine particle emission reductions. The program, which requires non-federal matching funds, generates on average \$13 in clean air benefits for every \$1 provided through it.<sup>3</sup>

Every dollar invested in diesel retrofits and replacements yields at least \$13 in environmental and public health benefits. Plus, DERA has provided federal funds in a competitive process that encourages state, local, or private funding matches. By doing so, DERA has been able to leverage roughly \$3 in state, local, or private funding for every federal dollar. It is hard to find a better

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<sup>2</sup> <https://www.healtheffects.org/publication/executive-summary-advanced-collaborative-emissions-study-aces>

<sup>3</sup> <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockkey=P100OHMK.pdf>

investment in public health. The DERA program has benefitted every state including those represented on the Committee. For example, in Delaware, DERA funds have gone to upgrading equipment at the Port of Wilmington, local school bus fleets and municipal vehicles, as well as off-road and construction equipment. In Sublette County Wyoming, the Wyoming Department of Environmental Quality used a combination of funds, including a \$1.1 million EPA grant, as part of a \$2.3 million project that involved 11 non-road construction companies and 34 pieces of equipment. The project involved machine repowers and engine upgrades in construction equipment in the infrastructure serving the Pinedale natural gas fields.

### **III. THE IMPORTANCE OF RETAINING THE DIESEL EMISSIONS REDUCTION ACT (DERA)**

While new clean technologies including clean diesel are ready and available today, introducing these technologies in the fleet of heavy-duty on and off-road equipment is a lengthy process. The DERA program is a necessary tool to introduce these technologies sooner than they would occur under normal attrition rates.

#### **Commercial Vehicles and Buses**

America's fleet of trucks, school buses and transit buses are relatively old and do not come with the latest near-zero emissions technology. Today, diesel is the predominant powertrain found under the hood of America's fleet of commercial vehicles, transit buses and school buses. Seventy-five percent of commercial vehicles, 95 percent of school buses and 85 percent of transit buses are powered by diesel technology. According to vehicle in operation data compiled through 2017, about two out of every three trucks and buses on the road does not come with the latest near-zero emissions technology developed to meet the latest tailpipe emissions standard established for model year 2010. The DERA program is an effective and needed tool to provide incentive funds to encourage the owners of commercial trucks, school buses and transit buses to replace older equipment with new.

#### **Support for a New Engine Standard**

Commercial vehicles will be getting cleaner and the DERA program will help introduce these new technologies to benefit communities. Engine manufacturers and other stakeholders are working with EPA concerning a new heavy-duty engine standard that will take near-zero emissions for fine particles and NOx closer to zero while still working within stringent fuel economy standards. That program, the *Cleaner Trucks Initiative*, is ongoing and will see further reductions in emissions. If the past is any indication of the future, introducing these closer-to-zero innovations will take time and the DERA program is an important tool to deliver emission reduction benefits to communities across the country.

#### **Off-Road Equipment**

Unlike commercial vehicles, owners of off-road equipment are often not required to register equipment like the owner of a truck or car. Off-road equipment, including construction and agricultural tractors, are understood to be of a later generation of technology. These are expensive assets that owners will continue to maintain to ensure they are in the field and on job

sites. Like commercial vehicles, the DERA program is an effective tool to help incentivize the replacement of equipment with new clean diesel Tier 4 technologies.

### **Large Engines that Power Marine Vessels and Switch Locomotives**

The fleet of marine vessels and switch locomotives are powered by very large engines, which are often in service around the clock and operate in localized regions. Switch locomotives, for example, rarely leave a narrowly defined geographical region. Recent research commissioned jointly by the Diesel Technology Forum and the Environmental Defense Fund determined that these engines are older and live longer.<sup>4</sup>

Replacing these engines, with help from the DERA program, can introduce the latest clean diesel innovations and generate substantial emission reductions. Research confirms that marine engines remain in service upwards of 50 years as opposed to the 23 years estimated by EPA. Older uncontrolled engines may operate in sensitive communities for generations. The DERA program is a necessary tool to encourage the owners of these much larger marine vessels to replace older engines with new cleaner models. A single engine replacement, when replacing an older uncontrolled engine, can eliminate 30 tons of NOx emissions in a single year. This is equivalent to replacing 96 older Class 8 trucks. Without DERA funding, many of these older marine vessels may be in operation for many years.

Much like marine vessels, switch locomotives remain in service for about 50 years. Replacing the oldest engines that power switch locomotives, including those that were manufactured before emission controls were required of them, can reduce NOx emissions on average of nine tons per year. This is similar to replacing 29 large Class 8 trucks.

New clean diesel engines may also generate co-benefits in terms of greenhouse gas reductions and fuel savings. While Tier 4 clean diesel technologies are developed to reduce emissions of fine particles and NOx, some owners report additional benefits. One marine vessel operating in Puget Sound reported reducing 1,000 tons of greenhouse gas emissions from upgrading older engines with new clean diesel models, while a rail operator in the region reported saving 19,000 gallons of fuel per year when replacing an older engine with a new Tier 4 clean diesel model.<sup>5</sup>

#### **IV. DERA IS A PROGRAM THAT WORKS BECAUSE:**

1. Enjoys bipartisan support in Congress and a uniquely broad-based coalition of followers and supporters numbering over 500 organizations;
2. Is voluntary and incentive based, offering carrots – instead of sticks – to interested parties to participate;

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<sup>4</sup> <https://www.dieselforum.org/largeengineupgrades>

<sup>5</sup> <https://www.dieselforum.org/policyinsider/work-boats-working-for-clean-air>  
<https://www.dieselforum.org/policyinsider/switch-the-switcher-from-old-to-new-clean-diesel-locomotive-power>

3. Allows owners to choose verified technology that works best for their circumstances; not all technologies work on all equipment;
4. Gives states the flexibility to apply DERA funding based on local emissions inventories to improve air quality;
5. Provides for a results oriented, competitive process to ensure the greatest level of success;
6. Gives greater understanding of the practical issues at the intersection of environmental goals and real-world business decisions; making distinctions between what is technologically possible and economically practical;
7. Encourages private and local investment through the provision of matching funds to leverage the federal incentive dollars by as much as 3 to 1; and
8. Rewards the American public with a substantial return on its investment, as much as \$13 in benefits for every dollar invested.

### **CONCLUSIONS**

Diesel engines are the workhorse of our economy for today, tomorrow and the foreseeable future. The new generation of clean diesel technology – cleaner fuel, advanced engines and emissions control systems – is now at near-zero levels of emissions. End users that have acquired the new technology are finding it to meet or exceed their expectations with performance, fuel economy and low emissions. Every category of stationary and mobile diesel engines, with the exception of ocean-going container vessels, is now on a regulatory path to near-zero emissions diesel engine technology.

There is a clearly identified need for DERA, a voluntary incentive-based program to modernize and upgrade existing engines and equipment. Congress played a visionary role in establishing and funding this voluntary incentive-based program to encourage these activities. Although DERA funds have leveraged other dollars, there is no question that the number of engines retrofitted or replaced to date represents only the tip of the iceberg. Older generations of technology still power everything from commercial trucks and buses to much larger marine vessels and switch locomotives. It is even more important to help fund programs to retrofit and replace these older engines, vehicles and equipment, as even cleaner technologies are on the drawing board. If ever a program made sense and had the support of environmental, labor, public health and industry groups, this is the one.

We thank you for the opportunity to provide these comments to you as you consider efforts to promote American leadership in reducing emissions through innovation. Please feel free to contact me with any questions or concerns. I can be reached at (301) 668-7230.

Very truly yours,



Allen R. Schaeffer  
Executive Director