DIESEL TECHNOLOGY FORUM

December 10, 2014

The Hon. Ed Whitfield
Chairman
Subcommittee on Energy and Power
Committee on Energy and Commerce
Rayburn House Office Building, Room 2184
Washington, DC 20515

The Hon. Bobby Rush
Ranking Member
Subcommittee on Energy and Power
Committee on Energy and Commerce
Rayburn House Office Building, Room 2188
Washington, DC 20515

Dear Chairman Whitfield and Ranking Member Rush:

Thank you for holding the hearing titled *The Energy Policy and Conservation Act of 1975: Are We Positioning America for Success in an Era of Energy Abundance?*

Diesel power is the lifeblood of the global economy. With its unmatched combination of energy density, fuel efficiency, power and performance, diesel engines are the primary technology driving 15 key sectors of the U.S. economy, from agriculture and construction to goods movement and warehousing.

The new generation of ultra-low sulfur clean diesel fuel and clean diesel engines and equipment are two of America's greatest success stories; ones that are not only delivering real-world benefits here at home today, but are leading export technologies helping to advance environmental improvements and energy efficiency gains in developing countries around the world.

While there is considerable attention being placed on the possibilities for export of natural gas from the U.S., you should know that ultra low sulfur diesel fuel is today America's number one petroleum export earning significant export revenues. Advanced clean diesel engines represented 4.4% of US exports in 2010, with an export-to-value ratio 5 times higher than the national average.[1] Clean diesel fuel is vital to help the U.S. achieve current and future clean air and climate goals. Demand for clean diesel fuel will only increase around the world as other countries' economies grow, driving demand for powerful modern diesel engines that will also improve air quality and reduce carbon emissions.

By way of background, the Diesel Technology Forum serves as a not-for-profit educational and advocacy organization raising awareness of the latest clean diesel innovations along with the importance of diesel fuel,

[1] Diesel Powers the US Economy (2011). Aspen Environmental and M-Cubed. http://www.dieselforum.org/about-clean-diesel/powering-the-u-s-economy

engines, vehicles and equipment to the economy. Our members represent the leaders in clean diesel technology including engine, vehicle and equipment manufacturers who have invested billions to develop the latest clean technologies.

Diesel Fuel is A Key Component of America's Energy Abundance and Puts Us on the Path to Energy Security

Newfound oil and gas reserves has helped the U.S. achieve energy abundance. The U.S. Energy Information Agency (EIA) recently announced that proven petroleum reserves in the U.S. exceeded 36 billion barrels for the first time since 1975.[2] While much attention has been focused on natural gas reserves, the U.S. is now a net exporter of petroleum products for the first time since 1949 thanks to these recent discoveries of petroleum reserves. Ultra Low Sulfur Diesel fuel (ULSD) with 15 part per million (ppm) or less sulfur content is the largest single petroleum products exported in 2013. U.S. refiners exported almost 319 million barrels of clean diesel fuel abroad representing 25% of all petroleum products exported. World wide demand for US clean diesel fuel earns significant export revenue.

International experts predict that diesel is on course to remain the number one global transportation fuel. The International Energy Agency recently stated that diesel is expected to overtake gasoline as the top transportation fuel used in passenger vehicles and in the freight transportation sector.[3] One of the largest global oil producers, ExxonMobil, recently confirmed diesel's expected dominance while also stating the much of the anticipated growth in diesel will come from emerging economies.[4]

Top 5 U.S. Petroleum Product Exports (2013)

Petroleum Products	Barrels	Share of Total Petroleum Product Exports
U.S. Exports of Distillate Fuel Oil, 0 to 15 ppm Sulfur	318,893,000	25.1%
U.S. Exports of Petroleum Coke	191,218,000	15.0%
U.S. Exports of Conventional Motor Gasoline	136,147,000	10.7%
U.S. Exports of Residual Fuel Oil	132,153,000	10.4%
U.S. Exports of Liquified Petroleum Gases	121,058,000	9.5%

SOURCE: U.S. Energy Information Agency. Total Crude Oil and Product Exports by Destination

The Clean Diesel System Depends on Clean Diesel Fuel to Deliver Climate and Clean Air Benefits

The benefits of clean diesel are not limited to clean fuel. A regulatory pathway established in 2000 by the U.S. Environmental Protection Agency (EPA) understood the enormous clean air and fuel savings benefits of a variety of clean diesel technologies. This regulatory pathway called for the production and distribution of ULSD beginning in

[2] http://www.eia.gov/naturalgas/crudeoilreserves/?src=home-b1
[3] "World Energy Outlook: 2014". International Energy Agency. November 2014.
[4] "Outlook for Energy: A View to 2040". ExxonMobil. December 2014. http://cdn.exxonmobil.com/~/media/Reports/Outlook%20For%20Energy/2015/2015-Outlook-for-Energy_print-resolution.pdf

2006 along with new engine emissions standards for heavy duty vehicles applied in 2007 and further tightened in 2010. Similar standards, the "tier 4" rules, were established for new off-road engines, such as those found in construction and agricultural equipment, beginning in 2014 and for high horsepower applications such as large marine, mining and stationary industrial engines beginning shortly in 2015.

Significant resources were invested by engine, vehicle and equipment manufacturers to develop technologies to deliver these near-zero emissions benefits. These technologies reduce emissions of particulate matter, or soot, and oxides of nitrogen, a smog forming compound, over 90%. It takes 60 heavy duty trucks manufactured in 1988 to generate the same emissions as one clean diesel truck today. The clean diesel system of modern engine designs and advanced emissions controls, including filters and catalysts, may only operate properly when fueled with ULSD with a sulfur content of 15 ppm or less.

Clean Diesel is On the Road Today Saving Fuel for Truckers and Delivering Clean Air for Everyone

According to state vehicle registration data for 2013, almost 3 million of the roughly 8.8 million Class 3-8 heavy-duty vehicles on the road across the country are deployed with an engine that meets the first 2007 clean diesel standard. Another 1.2 million vehicles is deployed with an engine that meets the stricter 2010 standard. These vehicles range from Class 3 vocational pickups, to school and transit buses, delivery trucks, first responder vehicles, up to large Class 8 over-the-road tractors. By way of reference, there are only roughly 150,000 registered Class 3-8 natural gas powered vehicles on the road.

Clean diesel vehicles on the road today are delivering real-world benefits for communities and vehicle owners. According to research commissioned by the Diesel Technology Forum, the almost 3 million clean diesel trucks on the road today since 2007 have reduced NOx emissions by 27,000 tons and particulate matter by 1 million tons. Fuel savings technologies deployed as a part of the second 2010 emissions milestone results in a reduction of 5.7 million tons of carbon emissions while reducing petroleum consumption by 13.3 million barrels. This carbon reduction is equivalent to reducing 1.2 million passenger vehicles from the road for one year. While we all benefit from the clean air attributes of diesel technology on the road today, vehicle owners also benefit from these technologies. According to research commissioned by the Diesel Technology Forum, the owner of a typical Class 8 tractor on the road for about 130,000 miles per year will see fuel savings that total about $3,500 each year. This is substantial savings for vehicle owners.

Heavy duty clean diesel vehicles are delivering more than their required clean air benefits. According to the Advanced Combustion Engine Study (ACES): Phase 2 research conducted by the Southwest Research Institute and the Coordinating Research Council, heavy-duty clean diesel engines result in real world emissions below the regulated threshold.[5] This study analyzed the emissions from three heavy duty vehicle engines manufactured in 2010 and found that emissions of PM were more than 80% below the 2010 requirement and emissions of NOx 60% below the standard.

Clean Diesel Passenger Vehicles Provide More Clean Air Benefits and Promote Energy Security

Access to clean diesel fuel also engendered the introduction of similar technologies deployed on passenger vehicles to deliver significant fuel savings benefits to owners and clean air and climate benefits to everyone. Today, there are about 252 million registered diesel powered passenger vehicles representing about 2.8% of total passenger vehicles according to state registration data for 2013. According to the EPA, a diesel powered passenger vehicle delivers a 20% to 40% improvement in fuel economy along with a 10% to 20% reduction in emissions compared to a comparable gasoline powered vehicle.

[5] http://www.healtheffects.org/Slides/AnnConf2013/Khalek-TuesPM.pdf

Growing consumer interest in diesel passenger vehicles is providing significant clean air and fuel savings benefits today. According to research commissioned by the Diesel Technology Forum, the number of diesel passenger vehicles on the road since 2005 have reduced carbon emissions by over 7 million tons and reduced petroleum consumption by 29 billion barrels of crude oil. Baseline estimates take the share of diesel passenger vehicles from about 2.8% of the market today to 7% by 2020 providing another 7 million tons of carbon reduction and reducing petroleum consumption by 31 million barrels of crude oil.

Cleaner Fuel Also Helps Improve Emissions from Older Engines Still In Use

Many older diesel engines found in a wide variety of applications are also in-use thanks to the inherent longevity and durability of the diesel powertrain. With the widespread availability of ULSD, retrofit devices may be applied to these older engines to improve the emissions performance and provide clean air benefits. In certain applications, diesel particulate filters may be applied to significantly reduce particulate emissions while in other instances a series of catalysts and other technologies may be applied to reduce oxides of nitrogen. All of these technologies may only be applied when fueled with ULSD.

There are a variety of federal programs to help the owners purchase these retrofit devices to improve the emissions profile and provide clean air benefits to communities. The Diesel Emission Reduction Act (DERA) program, managed by the EPA, is one of the most successful federal programs providing incentive funding for owners to make these retrofit purchase decisions. Since implementation, DERA has become one of the most cost-effective clean air federal programs. Every $1 in federal assistance is met with another $3 in non-federal matching funds, including significant investment from the private sector to provide $7 to $18 in clean air and economic benefits. The program has helped retrofit a wide variety of engines, vehicles and equipment from a large number of school buses across the country to ferry boats in New York City, switch locomotives in Chicago railyards and almost 200 pieces of construction equipment in Kentucky.[6]

Federal retrofit activities have not kept pace with need. Applications for DERA assistance has exceeded available funds by 7 to 1 suggesting that there is still a large population of older vehicle and equipment in use. While need for retrofit assistance continues, funding for the DERA program has diminished since 2009. The current year appropriation at $20 million is a fraction of the level authorized for the program established at $100 million. The Department of Transportation also manages a retrofit program to improve the emission profile of older construction equipment in use on federal aid transportation projects located in areas of poor air quality. However, the Federal Highway Administration has not issued any policy guidance concerning that program contained within the *Congestion Mitigation and Air Quality Program* (CMAQ) that would help interested state Departments of Transportation retrofit construction equipment and improve air quality for communities surrounding public works projects.

U.S. Exports of Clean Diesel Fuel Can Help Mitigate the Impact of a Warming Planet

One of the enormous benefits of the clean diesel system rests on its virtual elimination of black carbon emissions. Black carbon has been identified as a *short lived climate pollutant* that acts much as a greenhouse gas by trapping heat in polar and glacial ice. While carbon emissions may stay in the atmosphere for decades, black carbon emissions reside for only a few days. Unlike carbon dioxide emissions, existing and proven technologies exist to nearly eliminate black carbon emissions. Globally, forest fires, charcoal cookstoves and other biomass sources are the largest contributor to black carbon. However, transportation sources of black carbon from light- and heavy-duty diesel engines are one of the larger sources of black carbon from industrialized and emerging economies.

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[6] "Second Report Top Congress: Highlights of the Diesel Emission Reduction Program". U.S. EPA. March 2012. http://www.epa.gov/cleandiesel/documents/420r12031.pdf

Thankfully, a cadre of leading climate scientists and international organizations including the United Nations recognize that the clean diesel system can significantly reduce black carbon quickly. Industrialized economies including the U.S., the European Union, Japan, Australia and others have introduced cleaner diesel fuel requirements along with modern engine standards and programs to retrofit older equipment. Industrialized economies have typically adopted a close variation of either the U.S. emissions standards for on- and off-road engines or the European standards. In the U.S., the EPA predicts that particulate matter emissions (a close proxy for black carbon) from diesel sources is expected to fall 70% between 2005 and 2030 due to the further adoption of the clean diesel system. [7]

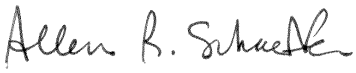
A growing number of emerging and less developed economies are getting on the clean diesel pathway.[8] Efforts to introduce modern engine emissions standards and retrofit programs for older engines have been hampered by the lack of clean diesel fuel. Growing U.S. exports of clean diesel fuel will go a long way to help these countries adopt clean diesel programs to improve air quality and generate significant climate benefits. The largest market for U.S. clean diesel fuel is Latin America. Even with large petroleum industries throughout Latin America, over 60% of U.S. ULSD exports reach Latin American markets and can help put many of these countries on the clean diesel pathway to improve air quality and help mitigate a warming planet.

Conclusion

We hope that you recognize the important role of diesel fuel in the energy abundance and energy security debate. U.S. exports of clean diesel fuel have tripled in five years from about 85 million barrels in 2009 to 319 million in 2013. Here in the U.S., ULSD has been the cornerstone of the clean diesel system that brought to the market place next generation diesel engines and aftertreatment technologies that reduced to near zero emissions of particulate matter and oxides of nitrogen. These technologies have proven themselves in the market place as well. The clean diesel system is deployed in one-in-three heavy duty vehicles and have reduced NOx emissions by an estimated 1 million tons and particulate matter emissions by 27,000 tons. Further clean air benefits will accrue as more of the heavy-duty fleet transitions to new technology deployed with clean diesel systems. Clean diesel fuel is also playing an important role in improving emissions from older diesel engines still in use by allowing owners to install retrofit devices that provide significant air quality benefits. Growing U.S. clean diesel fuel exports, particularly to Latin America, will enable emerging economies adopt the clean diesel system that includes modern engine standards and programs to improve emissions from older engines. One of the important benefits from the continued global adoption of the clean diesel system will be significant reduction in black carbon emissions. One leading climate researcher estimates that reducing 1 ton of black carbon emissions is equivalent to removing 1,000 to 2,000 tons of carbon dioxide.[9] Thanks to the clean diesel system, black carbon emission reductions are achievable.

Please feel free to contact me or Ezra Finkin our Director of Policy with any questions or concerns at (301) 668-7230.

Sincerely,



Allen Schaeffer
Executive Director

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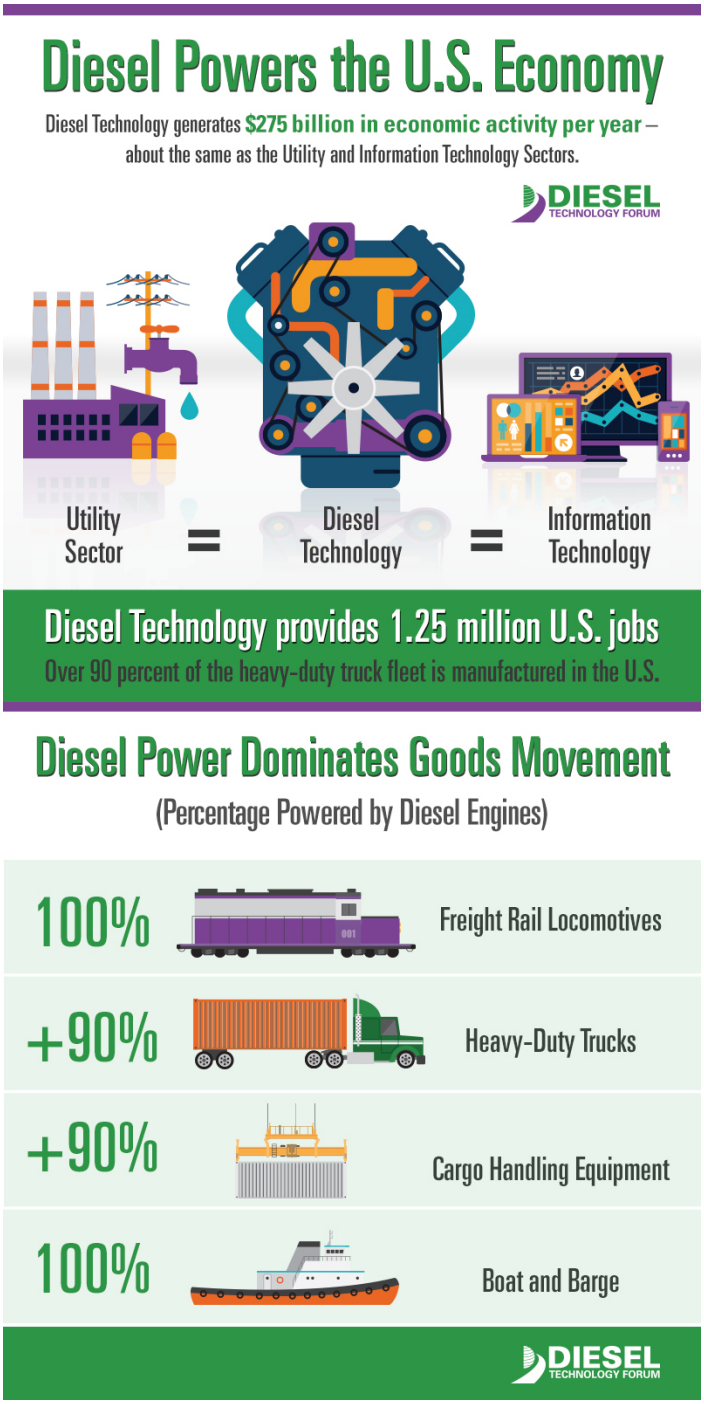
[7] "Report to Congress on Black Carbon", U.S. EPA. March 2012. http://www.epa.gov/blackcarbon/2012report/fullreport.pdf
[8] Global Engine Emissions Standards. http://transportpolicy.net/index.php?title=Category:Emissions_Standards
[9] Prof. Ramanathan. Remarks to the India California Air Pollution Mitigation Program. 2013.

APPENDIX


Diesel Powers the U.S. Economy
Diesel Technology generates $275 billion in economic activity per year – about the same as the Utility and Information Technology Sectors.
DIESEL TECHNOLOGY FORUM
Utility Sector
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Diesel Technology
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Information Technology
Diesel Technology provides 1.25 million U.S. jobs
Over 90 percent of the heavy-duty truck fleet is manufactured in the U.S.
Diesel Power Dominates Goods Movement
(Percentage Powered by Diesel Engines)
100%
Freight Rail Locomotives
+90%
Heavy-Duty Trucks
+90%
Cargo Handling Equipment
100%
Boat and Barge
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