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FEDERAL EFFORTS TO PROTECT PUBLIC HEALTH BY REDUCING DIESEL EMISSIONS

HEARING

BEFORE THE

SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR SAFETY

OF THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

ONE HUNDRED TWELFTH CONGRESS

FIRST SESSION

MAY 12, 2011

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ONE HUNDRED TWELFTH CONGRESS
FIRST SESSION

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FEDERAL EFFORTS TO PROTECT PUBLIC HEALTH BY REDUCING DIESEL EMISSIONS

THURSDAY, MAY 12, 2011

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR SAFETY,
Washington, DC.

The subcommittee met, pursuant to notice, at 2:30 p.m. in room 406, Dirksen Senate Office Building, the Hon. Thomas Carper (chairman of the subcommittee) presiding.

Present: Senators Carper and Barrasso.

STATEMENT OF HON. THOMAS CARPER, U.S. SENATOR FROM THE STATE OF DELAWARE

Senator CARPER. This hearing will come to order.

I think this might be, I might be mistaken, but I think this might be the first time that we have sat side by side in open hearings. Am I mistaken?

Senator BARRASSO. It is a great day for America.

Senator CARPER. I would like to think so.

All right, welcome to our guests and those who are testifying and those who are not. But we appreciate the effort of all of you to join us here today.

Today's subcommittee hearing will review the Federal efforts, the ongoing Federal efforts to protect public health by reducing diesel emissions. Senator Barrasso and I have about 5 minutes for opening statements, give or take, and then I will recognize our panel of witnesses. You will have roughly 5 minutes for your opening statements. If you go a little beyond that, it is OK. If you go way beyond, that is not OK. But your entire statements will be made part of the record and we will have a couple of rounds of questions after that.

We just had our last vote of the day and I saw a number of Senators streaming for the exits, and I don't think they were coming here. They were probably smelling, what is it, aviation fuel. So a lot of them are probably heading home by now, but we are here and we are very much interested in what you have to say and so are the staffs. A lot of the staffs are actually watching on television.

But my colleagues and I were sent to Washington, as I am often reminded, to govern, to find common sense solutions to the challenges that face our Nation. I don't believe that Americans are especially interested in ideas that are Democrat or Republican. They want us to come up with ideas that will work and that we can all

agree on to make our country even better, like I like to say. I think I have heard Senator Barrasso say this. In the end, we are in this together. We need to figure out together how to get to a better place.

Cleaning up dirty diesel emissions provides us with an opportunity to walk across the aisle. That is something we don't do enough these days. I remember when George Voinovich sat in the seat now occupied by Senator Barrasso and when he sat in this seat chairing this subcommittee, one day he said to me, you know, we ought to work on reducing diesel emissions in our country. They talked about how we could get a payoff, I think for every dollar of investment, we would get about a $13 public benefit. He convinced me in about 5 minutes that this was a good thing to do. We have had I think great success for our country; a lot of bipartisan support for that. What we are doing today actually helps to build on that.

But our Nation relies heavily on diesel power to transport commuters, to harvest our crops and to build our infrastructure. One of the good things we always say about the diesel engines is that they last a long time. The bad thing about diesel engines is that they last a long time.

Clean diesel engines made today are reaching near zero emissions, but that does nothing for the millions of engines already in use. They are going to be with us for 20 years and more. Despite new engine standards, the EPA estimates that there are some 11 million diesel engines in America that are lacking the latest pollution control technology, 11 million.

These older diesel engines emit black carbon and toxic particles which we will hear today cause significant harm to the environment and to our health. Retrofitting or replacing older diesel engines with American-made technology can dramatically reduce diesel emissions.

Unfortunately, there are few direct economic incentives for vehicle and equipment owners to retrofit or replace their old engines. Programs like the Diesel Emission Reduction Act help provide the right incentives to clean up our existing diesel fleet.

An idea that came from my friend Senator Voinovich, as I said earlier, DERA is one of the most cost-effective clean air Federal programs and it does indeed provide an economic and health benefit of some $13 for every dollar of moneys that are spent.

Through voluntary grants and through loans, DERA has reduced deadly emissions, saved lives and employed thousands of workers who manufacture, sell or who repair diesel vehicles and their components in each State. It is really a win-win-win situation.

The other day, I was getting off the train in Delaware and trying to rush to get someplace on the riverfront for this big dinner we were having to honor outstanding school performers, superior superstar performance in some of our schools. I ran to my minivan trying to get to the event, and I was late and I didn't want it to end before I got there.

I pulled up trying to get to the Chase Center on the riverfront, and I pulled up behind a bus that was just stuck in the road right in front of me. The place I needed to turn right was just ahead of the bus and the bus wasn't moving. On the back of the bus was

a sign, and it was one of these Chinese buses where you ride for $5 and go from Boston to Philadelphia or whatever. I got right behind this bus sitting there, and waiting for this bus to turn and hoping it will turn before the light turns red.

But I was sitting there behind the bus and it was a diesel bus. There is a sign on the back of the bus and the sign said, double happiness. When I think about what we are doing here with diesel emission reduction, it is really triple happiness. It is really triple happiness.

Because, one, we can use American technology, put Americans to work. We can end up by using something that is already an existing asset and diesels make it better. We can reduce emissions and make our American people healthy. That is a win-win-win. It is also triple happiness.

Last Congress, we reauthorized the DERA Program through 2016. We made some changes to try to improve DERA's effectiveness. Unfortunately, the President's budget for Fiscal Year 2012 zeroed out DERA funding. Although I appreciate dedication to reducing the Federal deficit, cutting such a successful program doesn't make sense. I like to say, if something is not working, then we ought to make it better. If it is not perfect, make it better. I would like to say as we allocate money to do certain things, we ought to ask the question: Can we get a better result for less money?

But in this case with $13 of benefit for every $1 of investment, that is a pretty good return and it is one that is hard for me to understand why the President would say, you know, we are going to zero that program out. It seems kind of counterintuitive.

But I will continue to work with my colleagues, with Senator Barrasso and others, to ensure that this program continues to be funded at reasonable levels. Although a great success, DERA has not been able to greatly reduce emissions from our Nation's construction equipment, the bulldozers, diggers, backhoes that build our Nation's infrastructure and produce some 25 percent of America's mobile diesel emissions.

At risk are children who live near construction sites, commuters stuck in traffic, and workers who operate construction equipment. In fact, heavy equipment operators who are exposed to diesel exhaust are 47 percent more likely to die from a heart attack, 47 percent.

To better address this problem, today I am introducing the Clean Construction Act of 2011. This common sense approach is simple. In areas of poor air quality, areas of nonattainment for 2.5 ppm, Federal transportation projects should reduce, not increase, deadly diesel emissions.

The Clean Construction Act accomplishes this goal by requiring just in those limited places where the nonattainment for ppm 2.5, but requires that 1 percent of the cost of the transportation project in a particulate matter nonattainment area be used to upgrade dirty diesel equipment.

The bill applies solely to particulate matter in nonattainment areas where significant air quality problems already exist.

Some will criticize this bill as diversion of transportation dollars. I understand that. However, I am going to ask my colleagues to recognize that 1 percent of the cost of a small set of projects is a

reasonable price to ensure that fewer Americans die from diesel soot, and this will do that.

In closing, we look forward to hearing from our witnesses today about the health impacts of diesel emissions and ways to get greater diesel emission reductions. I also look forward to working with Senator Barrasso, with other colleagues, to reduce diesel emissions that threaten our communities and our children.

[The prepared statement of Senator Carper follows:]

STATEMENT OF HON. TOM CARPER, U.S. SENATOR FROM THE STATE OF DELAWARE

My colleagues and I were sent to Washington to govern and to find common-sense solutions to the challenges facing our Nation. I don't believe Americans are especially interested in Democratic ideas or Republican ideas. They want us to come up with ideas that will work and we can all agree on to make our country even better.

Cleaning up dirty diesel emissions provides us an opportunity to work across the aisle, something we do too rarely these days. Our nation relies heavily on diesel power to transport commuters, harvest our crops, and build our infrastructure.

The good thing about diesel engines is that they last a long time, and the bad thing about diesel engines is that they last a long time. Clean diesel engines made today are reaching near zero emissions, but that does nothing for the millions of engines already in use and will be in use for the next 20 years.

Despite new engine standards, the EPA estimates there are 11 million diesel engines in America lacking the latest pollution control technology. These older diesel engines emit black carbon and toxic particles, which we will hear today, cause significant harm to the environment and to our health. Retrofitting or replacing older diesel engines with American made technology can dramatically reduce diesel emissions.

Unfortunately, there are few direct economic incentives for vehicle and equipment owners to retrofit or replace their old engines. Programs like the Diesel Emissions Reduction Act (DERA) help provide the right incentives to clean up our existing diesel fleet.

An idea that came from my friend Sen. Voinovich, DERA is one of the most cost-effective clean air Federal programs, averaging more than $13 in health and economic benefits for every $1 in funding. Through voluntary grants and loans, DERA has reduced deadly emissions, saved lives and employed thousands of workers who manufacture, sell or repair diesel vehicles and their components in each state. It is a true win-win-win.

Last Congress, we reauthorized the DERA program through 2016 and made some changes to try to improve DERA's effectiveness. Unfortunately, the President's budget for fiscal year 2012 zeroed out DERA funding.

Although I appreciate dedication to reducing the Federal deficit, cutting such a successful program doesn't make sense. I will continue to work with my colleagues to ensure this program continues to be funded.

Although a great success, DERA has not been able to greatly reduce emissions from our nation's construction equipment. The bulldozers, diggers, and backhoes that build our nation's infrastructure produce 25 percent of America's mobile diesel emissions.

At risk are children who live near construction sites, commuters stuck in traffic, and workers who operate construction machinery. In fact, heavy equipment operators who are exposed to diesel exhaust are 47 percent more likely to die from a heart attack.

To better address this problem, today I am introducing the Clean Construction Act of 2011. This common-sense approach is simple: in areas of poor air quality, Federal transportation projects should reduce, not increase, deadly diesel emissions.

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Some will criticize this bill as a diversion of transportation dollars. However, I ask my colleagues to recognize that 1 percent of the cost of a small set of projects is a reasonable price to ensure fewer Americans die from diesel soot.

In closing, I look forward to hearing from our witnesses today about the health impacts of diesel emissions and ways to get greater diesel emission reductions. I also look forward to working with my colleagues to reduce toxic diesel emissions that threaten our communities and our children.

Senator CARPER. Senator Barrasso.

STATEMENT OF HON. JOHN BARRASSO, U.S. SENATOR FROM THE STATE OF WYOMING

Senator BARRASSO. Thank you very much, Mr. Chairman.

I welcome all the witnesses who have joined us this afternoon.

It is a pleasure to work with you, Mr. Chairman. Mr. Chairman, in particular though, I want to recognize two constituents of mine from Wyoming, Mr. Todd Parfitt who is testifying today, as well as Ms. Jennifer Frazier. Mr. Parfitt is the deputy director of Wyoming's Department of Environmental Quality, and Ms. Frazier is an air quality engineer with the Department. So I want to thank them for traveling all the way from Cheyenne, WY.

Senator CARPER. I don't see her. Where is she?

Welcome. Looks pretty young. So does Mr. Parfitt.

Senator BARRASSO. You should spend more time in Wyoming, Mr. Chairman.

Senator CARPER. Maybe I will. I have been there before.

Senator BARRASSO. We would love to have you.

Senator CARPER. I will come back.

Senator BARRASSO. I know of the time commitments both of them have made to be here to discuss reducing diesel emissions in Wyoming and across the country, so I want to thank them for being here.

I want to thank all of our guests.

Today's hearing is on the efforts to protect the public health by reducing diesel emissions. I didn't have some of the statistics that you cited about the increased risk of heart attack and for every dollar spent, $13 saved. But obviously, the Diesel Emission Reduction Act, or DERA, has been instrumental in making those type of efforts successful.

The program has awarded hundreds of thousands of dollars to States like Wyoming to retrofit, and you mentioned the specific word retrofit in your comments, retrofit school buses, trucks and heavy equipment. The program has our support and has bipartisan support. This program to me is a model of how environmental progress can be achieved through providing States the flexibility that they need to achieve environmental goals.

This type of flexibility is not found in many of the new regulations that are coming out of the EPA these days. Let's look at what the Diesel Emission Reduction Act has achieved in Wyoming.

In 2008, DERA awarded Wyoming $196,000 from the EPA through the DERA State Grant Program to implement a unique diesel emission reduction project. The funds provided for purchasing one new hybrid electric diesel-powered school bus for the Wyoming Department of Education, which is behind you. That bus was delivered and was put into use in Pinedale, WY. It is now being used in Green River, WY. It is scheduled to move to either Cheyenne or Casper to determine its best uses.

Emissions and cost savings in fuel use are being tracked and the new hybrid electric diesel engine is expected to reduce fine particulate material emissions by 90 percent, NOx by 70 percent, increase fuel mileage by 70 percent, and reduce operational costs by at least 50 percent to comparable diesel-powered school buses.

In 2009, there was an award of $235,000 to the Wyoming Department of Environmental Quality through the DERA State Program to purchase a second hybrid electrical diesel-powered school bus for the Wyoming Department of Education. This time, the bus used a different technology to generate hybrid power. This bus is currently being used in Pinedale to compare its use to the previous hybrid technology that was tested in 2008. The bus is expected to be moved to either Casper or Cheyenne at the end of the current school year to gather more urban collection of data.

According to the Wyoming Department of Environmental Quality, similar emission reductions and cost savings as the first bus are expected and are being tracked for a final report.

Then in 2010, there was a grant of $588,000 to through the DERA State Grant Program to match funds with Fremont County to purchase a new 2010 emission-compliant bulldozer, an excavator, and the picture is behind us. This project was designed to show that new diesel engine technology could be applicable for use in normally nonregulated off-road diesel engine applications.

Both pieces of equipment replaced very old equipment and had essentially no emissions controls on them, what they replaced. The engines were required to be scrapped by the State in an effort to get that type of engine out of service. So the two pieces of equipment have been delivered and are in use in Fremont County today.

The emission data being collected are expected to show an increased fuel efficiency of 25 percent, reductions in NOx by 20 percent, particulate matter by 51 percent.

So these are just a couple of examples in Wyoming, by no means all of the examples, and I think we will hear from all of our people testifying today. Additional funds have been used to retrofit dozens of buses, trucks and other heavy equipment around our State.

So I look forward to working with you, Mr. Chairman, and the Members of this Committee in a bipartisan way to see that programs like this continue to have the support to succeed. I thank you, Mr. Chairman, for your interest and commitment to this program.

Senator CARPER. Thank you. Thanks for that statement, and I look forward to working with you on this and a lot of other stuff, too.

Let me go ahead and introduce or reintroduce our panel, starting off with Mr. Robert O'Keefe, vice president of the Health Effects Institute. Where is that located? In Boston, OK.

Next, Mr. Todd Parfitt. Again, as Senator Barrasso said, Mr. Parfitt serves as the Deputy Director of the Wyoming Department of Environmental Quality.

Next, Mr. Robert Lanham, vice president of Williams Brothers Construction Company, recently awarded the National Clean Diesel Camping Pioneer Award by EPA for all his leadership to reduce diesel emissions.

Where are you all from, Texas did you say? Houston. OK.

Next, Allen Schaeffer. Mr. Schaeffer serves as executive director of the Diesel Technology Forum.

Where are you all located? OK, Frederick, MD.

Finally, we have Mr. Conrad Schneider, no stranger to this subcommittee or this committee, the advocacy director of the Clean Air Task Force.

Very nice to see you, Mr. Schneider.

Again, roughly 5 minutes for your statements and then the full context of your statements will be part of the record, and we will get started on the questions.

Mr. O'Keefe, please proceed.

STATEMENT OF ROBERT O'KEEFE, VICE PRESIDENT, HEALTH EFFECTS INSTITUTE

Mr. O'KEEFE. Thank you very much.

Chairman Carper, Ranking Member Barrasso and other Members of the committee who will be reading this testimony later, thank you for the opportunity to testify before you today on the health effects of exposure to diesel exhaust.

I am Robert O'Keefe, vice president of the Health Effects Institute. We are a nonprofit, independent research institute uniquely funded equally by EPA and industry to carry out independent research on the health effects of air pollution, including diesel exhaust.

Sources of diesel, as you point out, are pervasive on the Nation's highways, and include trucks, buses, and in agriculture and construction, as well as rail and shipping. Given the numerous sources of diesel exhaust, population exposure can be widespread. HEI's 2010 review, Traffic-Related Air Pollution and Health, found that those living within 300 to 500 meters of a major roadway are most likely to be exposed to traffic air pollution.

The review found, remarkably, that 38 percent to 45 percent of the population in cities studied in the United States lived within this high-exposure zone. Urban industrial areas, including truck and bus depots, ports and constructionsites, can often have even higher concentrations.

Diesel exhaust from older engines, as you pointed out, is a complex mixture of fine particles, including black carbon, thousands of organic and inorganic components and some 40 hazardous air pollutants. It has been associated with health effects, including a range of respiratory symptoms, premature mortality, and potential links to lung cancer.

HEI's traffic review expert panel found a causal connection between exposure to traffic-related pollution and asthma exacerbation in children and adults. For example, HEI Review Committee Member Dr. Bert Brunekreef found in his study that children attending schools near roadways with heavy diesel truck traffic had significantly higher incidence of wheeze and other respiratory ailments than those schools with lower diesel exposure.

Diesel exhaust is also a significant contributor to the mixture of fine particles or $PM_{2.5}$ and black carbon in the ambient air. A number of epidemiological studies have found associations between exposure to PM and increases in illness and premature death. EPA itself has concluded that $PM_{2.5}$ is causally related to cardiovascular mortality and morbidity.

Based on HEI analyses and companion evidence, EPA estimates that over 20,000 annual premature deaths could be avoided by re-

placing older diesel technology, on-road and non-road engines, with newer, cleaner ones.

A number of national and international organizations, including HEI, have reviewed what we know from workers studies and from toxicology about older diesel engine exhaust and its possible association with lung cancer. Based on that evidence, the International Agency for Research on Cancer, the U.S. National Toxicology Program and USEPA have concluded that diesel from older engines is a likely human carcinogen.

Thus, there is an extensive body of literature suggesting that particles, including black carbon and other exhaust from older technology diesel engines, can have significant effects on the lung and the heart.

Having said that, with the advent of cleaner, low-sulphur fuels and new clean diesel technology, the way forward for diesel is exceptionally promising. In 2001, EPA promulgated the heavy duty on-highway diesel rules requiring significant reductions in fuel sulphur and in particle and nitrogen dioxide emissions. The diesel industry complied with this new regulation by developing advanced diesel technology, new particle filters and NOx controls.

At the same time this occurred, the diesel industry and government, including DOE, the EPA and the California Air Resources Board, supported a unique product stewardship initiative at the Health Effects Institute and the Coordinating Research Council. It was called the Advanced Collaborative Emissions Study, and it was the most rigorous emissions testing ever done on new heavy-duty engines.

The results of the testing of the emissions of these new diesel engines has been nothing short of dramatic. Emissions of fine particulate matter have been reduced by 99 percent from levels emitted by 2004 engines, only a generation before, and early 90 percent lower than the 2007 national emissions standards themselves.

Emissions of carbon monoxide, hydrocarbons and air toxics are more than 90 percent lower than 2004 levels, and NOx, which of course contributes to the formation of smog, was approximately 70 percent lower, with more reductions to follow. This substantial over-compliance with EPA standards is a credit to industry and regulators alike.

I have highlighted the negative health consequences of exposure to older technology diesel and the dramatic progress in producing new cleaner engines with particulate traps and advanced NOx controls that over time will penetrate the marketplace and result in cleaner air and improved health. Similar particle traps in companion technologies have now been applied as retrofits to existing vehicles, with similar reductions.

There is a challenge, however. Diesel engines, as you pointed out, have a long life expectancy which will slow fleet replacement and emissions reductions. Through natural replacement, the U.S. EPA does not expect full fleet turnover for on-road engines until 2030. This may take even longer for non-road. Given the evidence of effects from older diesel technology and the fact that retrofit and replacement technology exists to reduce these emissions and effects now, can action be taken to accelerate this transition?

Such an acceleration will help protect the current generation of Americans from the emissions of the legacy fleet of older diesels that will continue to operate on the Nation's highways and in its fields and workplaces for years to come.

Thank you.

[The prepared statement of Mr. O'Keefe follows:]

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Testimony of

Robert O'Keefe, Vice President
Health Effects Institute

On

Health Impacts of Exposure to Diesel Exhaust: Current Challenges and New Opportunities

Before the:

Senate Committee on Environment and Public Works
Subcommittee on Clean Air and Nuclear Safety

May 12, 2011

Chairman Carper, Ranking Member Barrasso and members of the Committee, thank you for the opportunity to testify before you today on the health effects of exposure to diesel exhaust. I come before you as the Vice President of the Health Effects Institute, a non-profit, independent research institute funded jointly and equally by the US EPA and industry to provide high-quality, impartial science on the health effects of air pollution. For over two decades, we have conducted targeted research on the full range of emissions and health effects from sources in the environment, including extensive research on diesel exhaust, and I am pleased to summarize our understanding for you today.

I would like to briefly highlight three topics of direct relevance to the current discussion of Federal efforts to improve public health by reducing diesel emissions, they are:

- Sources of and exposure to diesel exhaust,
- Population health effects of diesel exhaust, and
- The remarkable improvements in new diesel technology and emissions.

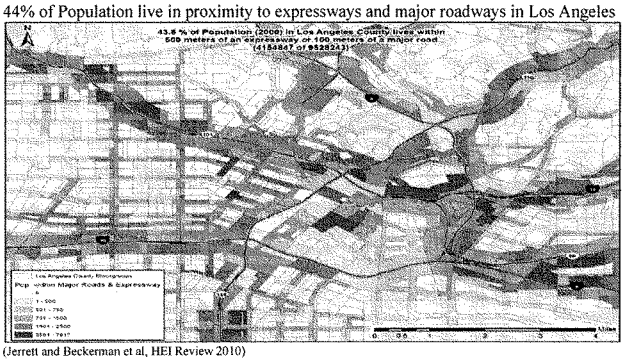
Sources and Exposure

Diesel engines are used extensively in transportation and construction in the United States, especially in heavy duty applications due to their power, durability and efficiency. Sources of diesel are pervasive in many parts of the country and include light duty and heavy duty trucks, busses, and a modest number of light duty vehicles all of which travel the nation's highways. There are also numerous off road vehicles used in agriculture and construction, as well as rail and shipping.

Given the numerous sources of diesel exhaust, population exposure can be widespread.

HEI's 2010 Review *Traffic Related Air Pollution: A Critical Review of the Literature on Emissions, Exposure and Health Effects* found that those living within 300-500 meters of a major roadway are most likely to be exposed to traffic related air pollution. The review assessed the percentage of the population living within this zone of likely exposure and found that between 38% and 45% of the population in cities studied in the US and Canada lived within this higher exposure zone. The following map illustrates Los Angeles, where population density and numerous major roadways result in a high exposure for 44% of the population. Urban industrial areas, including truck and bus depots, and some rail yards, ports and construction sites typically have higher concentrations.

44% of Population live in proximity to expressways and major roadways in Los Angeles



(Jerrett and Beckerman et al, HEI Review 2010)

Population Health Effects

Diesel exhaust from the older engines on the road today is a complex mixture of fine particles, including black carbon, and thousands of organic and inorganic components, some 40 of which have been identified as hazardous air pollutants by the USEPA. It has been associated with health effects including a range of respiratory symptoms, premature mortality from particulate matter, and designated as a likely human carcinogen by several prominent domestic and international governmental bodies. Today I will briefly touch on three examples.

Asthma Exacerbation

Diesel exhaust from older engines has been shown to exacerbate asthma in children and adults. HEI's study "Health Effects of Real-World Exposure to Diesel Exhaust in Persons with Asthma" led by Dr. Jim Zhang of the School of Medicine and Dentistry New Jersey, measured symptoms, airway function and cardiovascular responses of 60 study participants with asthma who walked on London's busy Oxford Street along which only predominantly diesel powered taxis and busses are allowed. The researchers then compared the responses of the same individuals after having them walk through nearby Hyde Park, where they were exposed to more general urban background air pollution. They found reductions in lung function that resulted from the short term exposure to the atmosphere on Oxford Street.

In an earlier study, a team led by HEI Review Committee member Bert Brunekreef found

that children attending schools near roads with heavy diesel truck traffic had significantly higher incidence of wheeze and other respiratory ailments. This and other evidence led HEI's Traffic Review expert panel to find a causal connection between exposure to traffic related air pollution and asthma exacerbation in children and adults.

Premature Mortality from PM
Diesel exhaust is a significant contributor to the mixture of fine particles (PM2.5) and black carbon in the ambient air, especially in heavily traveled urban areas. Epidemiological and other studies conducted over the last decade and earlier have reported associations between both long and short term exposure to PM and increases in illness and mortality. The most recent comprehensive study, HEI's *Extended Analysis of the American Cancer Society Study of Particulate Air Pollution and Mortality* (following a key population of over 360,000 Americans for 18 years), found continued associations of premature mortality, and especially associations of PM with much higher mortality from heart disease. This broad evidence led USEPA to conclude in the current Integrated Science Assessment for the PM National Ambient Air Quality Standard that PM2.5 is causally related to cardiovascular mortality and morbidity. Based on HEI studies, EPA estimated that over 20,000 annual premature deaths could be avoided by replacing older technology diesel on-road and non-road engines with new clean ones.

Lung Cancer
Diesel exhaust from older diesel engines and its possible association with cancer has been extensively studied in a range of toxicological, animal and human epidemiological studies. While study results have varied, HEI's *Diesel Exhaust: A Special Report* found a small but consistent increase in lung cancer risk for workers exposed to these older engines, and a number of national and international government agencies have concluded that diesel is likely carcinogenic in humans, though to varying degrees. These include:

- International Agency for Research on Cancer 1989: "*Probable human carcinogen*"
- National Toxicology Program 2005: "*Reasonably anticipated to be a human carcinogen*"
- USEPA 2002: "*Likely to be carcinogenic in humans*"

Thus there is an extensive body of literature suggesting that particle (including black carbon) and other exhaust from older technology diesel engines can have significant effects on the lung and heart. Having said that, with the advent of cleaner low sulfur fuels now required and dramatic advances in new clean diesel technology, especially the advent of the particle trap, the way forward for diesel is exceptionally promising.

Improvements in New Diesel Technology and Emissions

In response to the significant health concerns posed by exposure to diesel engines currently on the road, the U.S. Environmental Protection Agency promulgated the Heavy-Duty On-Highway Diesel Emissions Rule of 2001. This rule required significant reductions fuel sulfur (to 15 PPM) and companion reductions in two key pollutants, particles and nitrogen dioxide (also an important ozone precursor) in "on road" heavy duty engines. Subsequently, these rules were extended to apply to a host of non-road construction, and agricultural equipment as well.

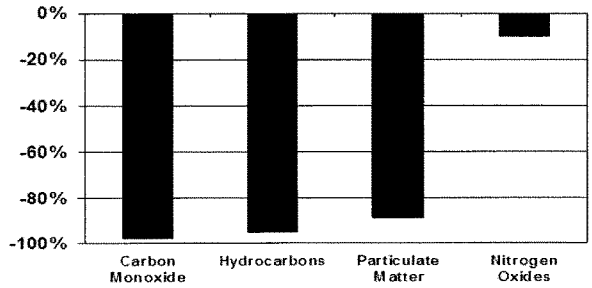
In order to comply with this new regulation, and as you will hear from others on this panel, industry developed advanced diesel engine and aftertreatment technology, including the use of new particle filters and NOx controls. At the same time, as part of a broader product stewardship initiative, government, including DOE, EPA and California, the diesel industry and

others came together to initiate at HEI and the Coordinating Research Council the Advanced Collaborative Emissions Study, the most rigorous emission testing ever done of new heavy duty engines - which power virtually every large truck and bus sold in the United States. The results of testing the emissions of these new diesel engines have been nothing short of dramatic.

The study, the comprehensive Phase 1 Report of ACES[1], found that emissions of fine particulate matter (PM) – a pollutant of significant public health concern – were approximately 99% lower than the PM emission levels allowed from 2004 technology heavy-duty diesel engines and nearly 90% lower than even the new 2007 national emissions standards for heavy-duty diesel vehicles (See Figure 1 below). This substantial over compliance with the stringent EPA standards is a remarkable achievement, and one that can be expected to make a significant contribution to improving the public health as the older engines are replaced.

Emissions of carbon monoxide, hydrocarbons, and a number of unregulated, so-called air toxics were also more than 90% lower than the 2004 levels and substantially below required levels. In addition, emissions of nitrogen oxides – which can have direct effects and contribute to the formation of smog – were approximately 70% lower than in the past and 10% below required levels. Another approximately 80% reduction in those emissions is required for engines sold after January 1, 2010.

Figure 1. Percent Below Required 2007 Levels



Unfinished Business

In summary, I have highlighted the negative health consequences of exposure to older technology diesel exhaust and the dramatic progress that has been made in producing new, cleaner diesel engines with particulate traps and advanced NOx controls that, over time, will

[1] The Phase 1 ACES study was conducted by the Southwest Research Institute in San Antonio, Texas under the oversight of the CRC. Investigators tested heavy duty diesel engines from the four major manufacturers of these engines, and subjected them to well-established federal test procedures, and to a much more rigorous 16 hour operation cycle designed especially for ACES. The engines were tested on multiple iterations of these cycles, and measurements of over 300 regulated and unregulated air pollutants were made in accordance with the highest laboratory standards.

penetrate the marketplace and result in cleaner air and improved health. As noted, diesel is also widely used in agricultural, construction, shipping and other enterprises and many of these (i.e. construction and farm equipment) will be subject to the new emission standards during the course of this decade. And the particle traps can and have been applied as retrofits to existing vehicles, with similar reductions in the mass of PM emitted.

There is a challenge however: diesel engines are exceptionally durable with a long life expectancy which will moderate the pace of fleet replacement and corresponding emissions reduction. Through natural replacement, US EPA did not expect full fleet turnover for heavy duty onroad engines until 2030; this will take even longer for nonroad engines. Given the evidence of effects from older diesel technology, and the fact that particle traps and companion technologies have been successfully applied as retrofits to existing vehicles, with similar reductions in PM mass, can action be taken to accelerate this transition? Such an acceleration will help protect the current generation of Americans from the emissions of the legacy fleet of older diesels that will continue to operate on the nation's highways, and in its fields and workplaces for years to come.

Clearly the technology to reduce emissions exists, and the public health benefits of those reductions, in terms of avoided mortality and respiratory health impacts can be expected to be significant.

Senator CARPER. Thanks very much. Those are impressive figures.

Mr. Parfitt, please proceed.

STATEMENT OF TODD PARFITT, DEPUTY DIRECTOR, WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY

Mr. PARFITT. Thank you, Mr. Chairman.

As was mentioned earlier, my name is Todd Parfitt. I am the deputy director for the Wyoming Department of Environmental Quality. I would like to thank Chairman Carper and Senator Barrasso for the opportunity to be here and testify at this hearing today.

Wyoming is a State rich in natural resources that provide significant amounts of the Nation's energy. As such, Wyoming's economy is largely dependent upon and driven by the mineral exploration and extraction industry. Wyoming recognizes and places great value on the protection of its natural resources. The mission of the Wyoming DEQ is to protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

As we carry out our mission, we do so with the understanding that it must be done in a balanced manner, protecting our natural resources, while maintaining the State's economic strength and stability. Oftentimes, new environmental regulations fail to adequately recognize the impacts created for industries and for the State agencies charged with their implementation.

This is not the case with DERA. Wyoming has successfully implemented voluntary programs that achieve reductions in diesel emissions from sources that are not covered under existing regulations. Voluntary programs like DERA are far less costly for the State to implement than traditional regulatory programs. This voluntary program has achieved desired reductions in air pollution without the negative implementation costs to both regulators and the regulated community. The DERA Program has been efficiently run by both EPA and the State with little negative impacts on State resources.

Wyoming has implemented four projects through DERA that will reduce diesel emissions and yield public health benefits. These projects include the purchase of two hybrid electric diesel-powered school buses put into use in southwest Wyoming, the replacement of heavy equipment utilized at landfills. This project was possible because economic incentives to local governments were available through DERA at a time when budgets would not allow these equipment upgrades.

The replacement and retrofit of 153 school buses, bringing 65 percent of the State's bus fleet up to 2010 emissions standards. Last, the implementation of emission control solutions for non-road construction equipment used by industry servicing the natural gas fields in Sublette County, WY.

Through a combination of DERA funds and industry contributions, nonregulated emissions reductions were successfully achieved as a result of engine retrofits, removing an estimated 744 tons of air pollutants per year.

Diesel-fired engines were built to last and that is exactly what they are doing. All of the Wyoming projects implemented under DERA have resulted in the replacement or retrofit of older engines, some dating back to the 1980's. The outcome is a reduction of air contaminant emissions, including precursors to ozone pollution. All of this results in cleaner air and health benefits to the citizens of Wyoming.

The public is exposed to pollutants associated with emissions from many sources. The emissions reductions resulting from implementation of DERA projects play an important role in improving air quality. This has clearly been an effective program in Wyoming with voluntary participation and significant contributions by both industry and local government.

The Wyoming DEQ supports the EPA initiative to conduct a retrospective review of existing regulations to weed out unnecessary and unproductive rules and programs. DERA is not one of those programs. We believe that EPA and the States would benefit from slowing the pace of new rules to allow for a more thorough evaluation of costs and impacts of implementation on the States and industry.

There are currently 99 new or revised rules under consideration by EPA in this year alone. EPA initiatives should strive to strike a balance between environmental protections and economic stability. By providing programs with State flexibility, environmental protection can be maximized while minimizing impacts to industrial growth and State budgets. DERA is a program that meets this criterion.

When EPA publishes its new ozone standard, which is likely to be reduced from the current 75 parts per billion, many more areas in the west will be considered in nonattainment of the standard. DERA provides needed assistance in reducing one of the key ozone precursors, nitrogen oxides. This is an excellent example of a program that leads directly to pollution reduction and provides an important piece of the solution to meeting a new standard.

With that, I would like to thank Senator Carper and Senator Barrasso for the opportunity for this testimony.

[The prepared statement of Mr. Parfitt follows:]

TESTIMONY OF

TODD T. PARFITT
DEPUTY DIRECTOR
DEPARTMENT OF ENVIRONMENTAL QUALITY
STATE OF WYOMING

BEFORE THE

SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR SAFETY

THOMAS R. CARPER, CHAIRMAN

AT ITS HEARING ENTITLED
"FEDERAL EFFORTS TO PROTECT PUBLIC HEALTH
BY REDUCING DIESEL EMISSIONS"

MAY 12, 2011

Good afternoon Mr. Chairman. My name is Todd Parfitt and I am the Deputy Director of the Wyoming Department of Environmental Quality. Also here with me today is Jennifer Frazier, an air quality engineer with the Department of Environmental Quality. I wish to thank Chairman Carper, Senator Barrasso and the members of this Subcommittee for inviting the State of Wyoming to testify at this hearing today.

Today I will speak briefly on Wyoming's perspective of the benefits of the Diesel Emissions Reduction Act, DERA, in reducing diesel emissions and improving public health.

Wyoming is a state rich in natural resource reserves that provide a significant amount of the nation's energy. As such, Wyoming's economy is largely dependent on and driven by the mineral exploration and extraction industry. Wyoming recognizes and places great value on the protection of its natural resources (air, water and land). The mission of the Wyoming Department of Environmental Quality is, "to protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations. " As we carry out our mission, we do so with the understanding that it must be done in a balanced manner, protecting our natural resources while maintaining the State's economic strength and stability.

Oftentimes, new environmental regulations fail to adequately recognize the impacts created for industry and for the state agencies that are ultimately charged with their implementation. This is not the case with DERA. Through DERA Wyoming has successfully implemented voluntary programs that achieve reductions in diesel emissions from sources that are not covered under existing regulations. Wyoming has participated in the DERA State Grant program since 2008 and the DERA National Grant program since 2009.

Voluntary programs like DERA are far less costly for the state to implement than traditional regulatory programs or standards. This voluntary program has achieved desired reductions in air pollution without the negative implementation costs to both the regulators and the regulated community. The DERA program has been efficiently run by both EPA and the State with little negative impact on state resources. Whereas, new

regulations often increase workload and require the State to augment staff, draft new rules and regulations; conduct public hearings, and increase inspection, compliance, monitoring and enforcement efforts.

Wyoming has implemented four (4) projects through DERA that will reduce diesel emissions and yield public health benefits. These projects include:

- The purchase of two hybrid electric diesel powered school buses, put in to use in Southwest Wyoming. This project includes an evaluation of the benefits of hybrid diesel buses in rural and urban settings;
- The replacement of heavy equipment utilized at landfills. This project was possible because economic incentives to local governments were available through DERA at a time when budgets would not allow equipment upgrades;
- The replacement of 15 and retrofit of 153 school buses. By working with the Wyoming Department of Education this project brought 65% of the bus fleet up to 2010 emission standards; and
- The implementation of emission control solutions for non-road construction equipment used by industry servicing the natural gas fields in Sublette County, Wyoming. Using the EPA Diesel Emissions Quantifier tool we estimate that this project resulted in the reduction of 744 tons per year of air pollutants. Through a combination of DERA funds and industry contributions non-regulated emissions reductions were successfully achieved as a result of engine retrofits.

Diesel-fired engines were built to last and that is exactly what they are doing. All of the Wyoming projects implemented under DERA have resulted in the replacement or retrofit of older engines, some dating back to the 1980's. The outcome is a reduction of air contaminant emissions, including precursors to ozone pollution. All of this results in cleaner air and health benefits to the citizens of Wyoming.

The public is exposed to pollutants associated with emissions from many sources. The emissions reductions resulting from implementation of DERA projects plays an

important role in improving the quality of air people breathe. This has clearly been an effective program in Wyoming with voluntary participation and significant contributions by both industry and local governments.

The Wyoming Department of Environmental Quality supports the EPA initiative to conduct a retrospective review of existing regulations to weed out unnecessary and unproductive rules and programs. DERA is not one of those programs. We believe that EPA and the States would benefit from slowing the pace of new rules to allow for a more thorough evaluation of costs and impacts of implementation on the states and industry. There are 99 new or revised rules under consideration by EPA in this year alone. EPA initiatives should strive to strike a balance between environmental protections and economic stability. By providing programs with state flexibility, environmental protections can be maximized while minimizing impacts to industrial growth and state budgets. DERA is a program that meets this criterion.

When EPA publishes its new ozone standard, which is likely to be reduced from the current 75 ppb, many more areas in the West will be considered in non-attainment of the standard. DERA provides needed assistance in reducing one of the key ozone precursors, NOx. This is an excellent example of a program that leads directly to pollution reduction and provides an important piece of the solution to meeting a new standard.

In conclusion, Wyoming wishes to thank Chairman Carper and this subcommittee for the opportunity to testify today.

Senator CARPER. Thanks, Mr. Parfitt. Well done.

Mr. Lanham, please proceed.

STATEMENT OF ROBERT LANHAM, VICE PRESIDENT, WILLIAMS BROTHERS CONSTRUCTION CO.

Mr. LANHAM. Mr. Chairman and Members of the committee, thank you for the opportunity to present the construction industry's perspective on reducing diesel emissions. I have said earlier, I am Bob Lanham, vice president of Williams Brothers out of Houston, TX. I am here today representing the Associated General Contractors of America. I have been AGC's Highway Division Chairman in years past. I have also served as the association's environmental committee chair.

I am proud to report, in addition to what you have already said, Mr. Chairman, in your kind introduction, that EPA has recognized us as a Pioneer in the national clean diesel effort. EPA has also recognized us and singles out our company as a case study on how to perform emission reduction projects. AGC has worked side-by-side with the EPA over the last 10 years in every major Federal initiative with regards to clean diesel in an effort to improve air quality while trying to protect the construction industry from serious economic harm.

Through all these initiatives, we sought four goals: No 1, to identify appropriate incentives for retrofit; No. 2, secure Federal funding for such retrofits; No. 3, inform our constituency, our member chapters, and get the word out with regards to the funds available; and No. 4, to work with the Congress to try to enable a Federal tax incentive for diesel retrofit.

Among all these initiatives, AGC also serves as a co-chair of a Federal Advisory Non-Road Construction Work Group, so our leadership extends on many fronts with regards to the subject. ABC was an original supporter and played a significant role in the development of DERA, the Diesel Emission Reduction Act. We continue to champion amendments to improve the process, make more funds available for private sector participation, and ensure a full funding of the program.

AGC chapters have been awarded significant DERA grants to aid their particular efforts. Diesel equipment is an essential element of a contractor, especially a transportation contractor like myself. Investment in equipment ranges from small equipment at tens of thousands of dollars to large equipment that is in the millions.

Regardless of the size of the contractor, the majority of our net worth is involved in the value of that equipment. Net worth provides financial security demanded by our banks and bonding companies. Solutions like we are talking about today does something special. It preserves that value of equipment; preserves our ability to protect our investment; and also give us and retains our ability to conduct business, wonderful solutions that permit these things.

Although Federal standards are improving, significant emission reductions are now in the new models coming off the assembly line. As you said, Mr. Chairman, diesel equipment lasts a long time. We think there is ample opportunity as the existing fleet develops and exhausts its economic life. There is public good that can be derived by addressing those emissions. We worked with the Clean Air Task

Force to develop what we call our clean construction principles. This collaboration resulted in agreement which conserves for our benefit the competitive bid system in our industry, preserves the value of our fleet, and supports our efforts to try to address transportation needs, and it compensates businesses for any associated cost.

We are pleased, Mr. Chairman, that this became a big part of your bill the Diesel Construction Act of 2011.

While the economic life of equipment is being exhausted, we would also like to encourage as we implement these things, based on my experience, and we have done nearly 400 emission reduction projects, that there are, as anything new, some cautions and concerns or challenges that will be faced.

Some of these things, one, these technologies are not cookie-cutter, not something you can go down to the shop and buy. There will be technology challenges, logistical challenges. There are also safety considerations that we need to address, as well as the essential performance of the piece of equipment.

But despite these challenges, these things with intelligent people are problems that can be addressed and overcome. We, realizing that, embrace this clean construction proposal proposed by Senator Carper. It strikes a careful balance between helping pay for installation and ultimately the contractors will assume the long-term maintenance of these devices, and allow States to apply value-based judgments in this program on a case-by-case basis to allow both the owners to clean up equipment on public projects and allow it to do it in a best possible manner to respect the taxpayers.

We are pleased, Mr. Chairman, to support the Clean Construction Act of 2011 and look forward to working with you in the legislative process.

[The prepared statement of Mr. Lanham follows:]

AGC of America
THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA
Quality People. Quality Projects.

Testimony of Bob Lanham

on behalf of

The Associated General Contractors of America

Presented to the

Subcommittee on Clean Air and Nuclear Safety

of the

Environment and Public Works Committee

United States Senate

on the topic of

Reducing Diesel Engine Air Emissions

May 12, 2011

Testimony of Bob Lanham, Williams Brothers Construction Company

On Behalf of the Associated General Contractors of America

To the Environment and Public Works Subcommittee on Clean Air and Nuclear Safety

United States Senate

May 12, 2011

Mr. Chairman and Members of the Committee thank you for the opportunity to present some of the construction industry's perspective on plans for "Reducing Diesel Engine Air Emissions." I am Bob Lanham, Vice President of Williams Brothers Construction Company located in Houston, Texas, and I am here today representing the Associated General Contractors of America. I have been both the chairman of AGC's highway division and the chairman of the association's environmental committee. I am also proud to report that the U.S. Environmental Protection Agency (EPA) awarded me the National Clean Diesel Campaign Pioneer Award for "exemplary efforts and early support of the National Clean Diesel Campaign – noting that my work has inspired other contractors to become involved and to unite behind the common goal of reducing diesel emissions." EPA has also singled out my company, Williams Brothers Construction Company, as a national model on how to proactively embrace innovative measures for reducing diesel emissions. In fact, the agency currently showcases my company's voluntary diesel retrofit efforts as a "case study" on its website.

AGC is the leading construction association in the country representing contractors that build all forms of infrastructure, including: highways, bridges, transit systems, railways, airport terminals and runways, water and wastewater treatment facilities, underground utilities, public buildings, multi-family housing, office buildings, military facilities, water resource projects, energy production and conservation facilities, and the many other structures that are the backbone of the U.S. economy and provide and ensure U.S. citizens' quality of life.

AGC has worked side-by-side with EPA in advancing every major federal "clean diesel" initiative intended to improve air quality and simultaneously protect the construction industry from serious disruption. These initiatives have sought (1) to identify appropriate incentives for the retrofit of diesel equipment, (2) to secure federal funding for diesel retrofit, (3) to inform AGC Chapters and fleet owners that they may qualify for government grants to retrofit existing fleets of construction equipment, and (4) to enact a federal tax incentive for diesel retrofit.

IDENTIFY APPROPRIATE INCENTIVES FOR THE RETROFIT OF DIESEL EQUIPMENT

AGC serves as the co-chair of a federal advisory "Non-road Construction Workgroup" that is charged with providing guidance and recommendations to EPA on the best strategies for

reducing emissions from construction equipment that is currently in use. In addition, under the last Administration, AGC served as the construction industry's representative to EPA's exclusive "Sector Strategies Program" and collaborated with EPA to develop reports and recommendations on positive incentives for diesel retrofit in the construction industry (see e.g., *Cleaner Diesels: Low Cost Ways to Reduce Diesel Emissions from Construction Equipment* (March 2007) and *Emission Reduction Incentives for Off-Road Diesel Equipment Used in the Port and Construction Sectors* (May 2005) – http://www.epa.gov/sectors/construction/#emissions).

AGC has played an active role in EPA's National Clean Diesel Campaign since its inception in 2000. At EPA's request, AGC helped to plan and moderate the "**Non-road Track**" at Clean Diesel 10 -- a significant event held late last year to celebrate the 10-year anniversary of EPA's National Clean Diesel Campaign -- and also served on the VIP Steering Committee for the conference. During the event, Gina McCarthy, assistant administrator U.S. EPA Office of Air and Radiation, thanked AGC for its "partnership" and "significant contribution to the clean diesel program." AGC of America remains an active partner in many regional Clean Diesel Collaboratives and we provide the association's 95 Chapters and nearly 33,000 members with the information they need to make the voluntary program work at the state and local levels.

SECURE FEDERAL FUNDING FOR DIESEL RETROFIT

AGC has long advocated for increased government investment in, and support for, the retrofit of off-road diesel construction equipment. AGC was an original supporter of the Diesel Emissions Reduction Act (DERA) dating back to 2005 and played a key role in the development and passage of that Act, which became part of the Energy Policy Act of 2005. As the bill was originally written, it did not ensure that qualified private fleets could apply for the public funds set aside for retrofitting equipment. Thanks to AGC's efforts, over the past five years, our Chapters and members have joined forces with other industry partners to voluntarily apply for federal grants under the EPA National Clean Diesel Funding Assistance Program. Notwithstanding the extremely fierce competition, several AGC Chapters have won significant grant awards and leveraged millions of dollars (in matching and in-kind contributions) to help their members afford the high cost of reducing emissions from construction equipment that is currently out in the field.

Today, AGC continues to lobby Congress for full funding of DERA. The association is proud of the role it played in securing reauthorization of federal DERA grants through 2016 and to amend certain provisions of the bill to help Chapters and members compete for federal aid under the EPA National Funding Assistance Program. AGC was pleased that the new legislation made two significant changes that will make the grants even more accessible to private industry. First the bill eliminates a requirement that 50 percent of the funds be made eligible only for public sector vehicles. Much of that fleet is newer and will amount to little in the way of clean up value for the dollar. The second change allows individual companies under contract with public agencies to apply directly for the grants rather than through a third party non-profit organization or government agency. This makes the process for applying much simpler for the recipients. These changes will make the program easier to navigate and more effective.

AGC also was very active in pushing diesel retrofit initiatives in SAFETEA-LU. AGC worked closely with Senators Inhofe and Clinton to craft Section 1808 of SAFETEA-LU, which allows states (and other recipients of federal-aid highway funding) to use CMAQ funds to pay for the retrofit of off-road diesel equipment needed to construct projects funded under Title 23 of the United States Code. Specifically, SAFETEA-LU added a new requirement that states and MPOs must give priority – in distributing CMAQ funds – to diesel retrofits, particularly where necessary to facilitate contract compliance, plus other cost effective congestion mitigation activities providing air quality benefits. The bill made money available for outreach and education on diesel retrofit technologies and helped to advance the introduction of new devices into the marketplace.

These changes in the law were supported by a Transportation Research Board findings in Special Report 264, the *CMAQ Improvement Program, Assessing 10 Years of Experience*. The report concluded that "...strategies directly targeting emission reduction have generally been more cost-effective than attempts under CMAQ to change travel behavior." It recommended re-authorization of the CMAQ Program with modifications to improve its cost-effectiveness and to enhance its performance in improving air quality. In addition, a report for the Emission Control Technology Association that builds on this TRB report and other data reaches similar conclusions about the cost-effectiveness of diesel retrofits

ENACT A FEDERAL TAX INCENTIVE FOR DIESEL RETROFIT

In addition, AGC seeks to modify the federal tax code to provide other financial incentives for contractors to retrofit their existing diesel equipment.

We were very involved in the recent changes to the California Air Resources Board (CARB) diesel reduction regulations. We helped CARB better understand the construction industry and the data used to create its emission models. By improving that data we also helped the state adopt a more effective emission reduction strategy based on the actual inventory of construction equipment in the state and the use of that equipment on a day-to-day basis. Together we created a more accurate model of the emissions in the state. Both the regulated and the regulators learned a lot about each other, and the final regulations provide a much more realistic and effective program than the program originally adopted by CARB.

AGC works hard to educate policy makers at the national and state level on the business of construction and on the potential pitfalls that come with manipulating the standard bidding process. AGC continues to explain that construction companies are worth the equipment they own and that any move that would render a company's fleet obsolete would wipe their balance sheet to zero overnight. Recognizing industry concerns, EPA and many states outside of California have aggressively pursued voluntary partnerships and programs aimed at cleaning up the legacy fleet.

Highway and transit contractors own large fleets of off-road construction equipment that is essential to their businesses. Off-road equipment is extremely costly, and small pieces of equipment, such as a backhoe, easily costs tens of thousands of dollars. Larger pieces of equipment, such as bull dozers, scrapers and excavators can cost $1 million dollars or more.

Transportation construction companies tend to self-perform as much of the work as they are allowed and therefore are highly reliant on their equipment. Even a very small highway construction company can have a majority of their net worth tied up in equipment.

Contractors are very careful with their equipment. It is often a significant portion of what contractors pledge to their bonding companies when they bid on public work. Emission reduction strategies for construction equipment are not cookie cutter add-ons. The appropriate emission reduction strategy for a piece of equipment may become inappropriate in certain circumstances. During the CARB debate, we heard about cookie cutter proposals that worked on one piece of equipment but created a hazard for the operator on another piece. We strongly believe that the goal of emission reduction strategy should be to reduce emissions without compromising safety or performance of the equipment. A flexible retrofit model will help improve the effectiveness of any retrofit program and help preserve the value of the equipment owned by the contractors.

CLEAN CONSTRUCTION PRINCIPLES

AGC has worked over the past several years with the Clean Air Task Force (CATF), the leading environmental group in the field of diesel pollution, to develop the "Clean Construction Principles." As a result of much communication and collaboration, we are in agreement that states should respect the competitive bid system and the public should bear the cost of retrofitting equipment already in use. Our hope in working cooperatively with CATF was to establish a workable solution for reducing diesel emissions without adversely impacting the construction industry or undermining our national efforts to address transportation infrastructure needs. We believe that the principles largely achieve these objectives, and AGC is pleased that these principles became the basis for Chairman Carper's Clean Construction Act of 2011.

The legislation would allow states to require that on and off road diesel equipment used on highway or transit construction projects in PM2.5 non-attainment areas use diesel emission control technology, but further requires the state to pay for the cost of installing the technology. The total payment is limited to 1 percent of the project cost. An important factor for the construction industry is that the requirement does not undermine the competitive bidding process. Instead, it allows the successful low bidder to receive payment for upgrading the emissions technology through a change order procedure. CMAQ funding, which already makes diesel retrofit a funding priority, can be used by states to meet this requirement.

While AGC is supportive of the legislation, we believe some additional adjustments would make the legislation more workable. First, we believe that states should receive State Implementation Plan credit for the emissions reductions that result from taking these steps towards meeting their Clean Air Act mandates. Second, we believe there should be a de minimus exemption from implementing these requirements for projects that are of short duration or of minimum dollar value. Third, we believe that the additional step of submitting a list of subcontractor equipment is burdensome on state DOTs and contractors and provides minimal increased emissions reductions.

LOOKING TO THE FUTURE

Great strides have been made in diesel engine technology over the past ten years. Equipment manufacturers have been meeting or exceeding Clean Air Act mandates. Diesel powered engines for off-road construction equipment are being produced right now for Tier 4 compliance. These machines will reduce particulate matter (PM) emissions by ninety percent. Over the next year, additional Tier 4 equipment will become available that will result in additional PM reductions from larger pieces of off-road equipment. Eventually these technology improvements will become the norm in the construction industry as contractors retire and replace their existing fleets of equipment the new technology is more widely used.

In the meantime, AGC understands there is a public good derived from speeding up the existing emissions reduction effort. We also know that there are constantly evolving advancements in after market technologies that can reduce particulate matter emissions from diesel engines. While installing emissions control technology on the existing inventory of equipment may in some cases increase the maintenance costs of construction equipment, AGC and its members have embraced proposals that balance local, state and national air quality goals with safety, reliability and value – the goals of every construction business. At a time when the construction industry is experiencing depression like conditions, with construction put in place at an 11-year low and unemployment in the industry over 17 percent, more than twice the rate of unemployment for the entire economy, now is a very difficult time to sell the idea of a new diesel retrofit mandate to our members. Nevertheless, AGC has embraced the clean construction proposal sponsored by Senator Carper because it strikes a careful balance between helping to pay for the initial installation (contractors will pay for the long term maintenance) and allowing states to apply a value based judgment that will see the dirtiest equipment cleaned up first. We believe that the application of this program on a case-by-case basis will allow construction project owners to both clean up equipment working on public jobs and to do it in a way that will allow the best possible deal for the taxpayers.

We believe that the flexibility of this proposal will be the key to its success. This diesel emissions reduction initiative applies to a huge variety of construction equipment. Unlike trucks or other on-road vehicles, construction equipment comes in myriad sizes, shapes and configurations. The equipment may have tracks, rubber wheels or other means of motive power, depending on the nature of the terrain that it has to traverse. Much of this equipment has "arms" that it must extend and move in unique ways to stabilize equipment and to extend its range. The operators of this equipment are skilled professionals well aware of the damage that it can cause and the injuries that it can inflict. There is no "one size fits all" technology available that will result in desired emissions reduction because compatibility for attachments and components for engine compartments and transmissions varies from one piece of equipment to another.

In producing its rule, CARB identified 19 different "equipment types" in the "construction and mining" category. We believe the product differentiation is much broader than that. To better understand the different types of equipment and their wide variety, we encourage you to visit the web sites of leading auctioneers of construction equipment, such as Ritchie Brothers, online atwww.rbauction.com. On January 17, 2010, this website featured 99 different classes of construction equipment, including 38 classes that appeared to be subject to the Rule. The

website also identified an average of 10 different manufacturers of the equipment in each of these 38 classes.

As new technologies are developed, it should be pointed out that what is possible under experimental conditions is not always possible under real world working conditions. This is especially true when you consider the wide variety of equipment used in construction and the often extreme conditions in which they are used. It is not enough to show that verified diesel emission reduction technology reduces emissions under laboratory conditions, or that new or rebuilt engines have lower emissions than engines already in use. Since diesel emissions reduction requirements apply to equipment already in the field, technology must be proven feasible in the field. We support the "Clean Construction Act of 2011" as introduced by Chairman Carper because it marries specific pieces of equipment with specific modifications that are feasible, safe and effective and that are verified on EPA or CARB lists.

It also gives state transportation officials the authority and funding to promote the use of the most effective clean construction equipment strategies on federally-funded transportation projects in PM non-attainment areas.

AGC believes that the "Clean Construction Act of 2011" sets the roadmap for improving air quality without creating a potential barrier to competition for federal and federal aid construction projects. The key to providing a value to the taxpayer is that it is not a blanket mandate, but a selective mandate that allows flexibility to identify and clean up the dirtiest equipment that will be operating on the project for at least 80 hours over the life of the project. The government administers the program through a fully funded change order process. By preserving the competitive bid process, the principles ensure that smaller firms that are the least able to invest in retrofits are not shut out of bidding for public projects, thereby making sure that some of the dirtiest equipment in service is eligible for clean up.

As the workhorse of our economy, diesel engines, especially those used in off-road construction equipment, will continue to play a major role in building our communities.
AGC is pleased to support the "Clean Construction Act of 2011" and looks forward to working with this committee to move the bill through the legislative process.

Senator CARPER. That was exactly 5 minutes. Thanks so much. Thanks for your encouragement and for your good stewardship and for setting a good example for the rest of us.

Mr. Schaeffer, please.

STATEMENT OF ALLEN R. SCHAEFFER, EXECUTIVE DIRECTOR, DIESEL TECHNOLOGY FORUM

Mr. SCHAEFFER. Thank you, Chairman Carper, Senator Barrasso. Good afternoon. My name is Allen Schaeffer and I am executive director of the Diesel Technology Forum. We are a not-for-profit educational group representing the Nation's leading diesel engine and equipment manufacturers, fuel refiners, and companies that make emissions control technology.

We are here today because diesel is the workhorse of the U.S. and global economy. It is the prime mover, powering over 90 percent of the commercial trucks, more than three-fourths of all transit buses, 100 percent of freight locomotives and marine work boats, and two-thirds of all farm and construction equipment.

Though not the subject of today's hearing, I would be remiss without mentioning the newest generation of clean diesel cars, which are providing the greatest effort toward reducing oil consumption and greenhouse gases, more than any other affordable drive technology today.

You have our detailed written statement. I am going to deviate from that. I would like to focus our attention on two attachments to our testimony, the first being these graphs that highlight the journey of transformation of clean diesel technology. This journey began in 2000 in what was then a time of a stretch goal of making diesel engines near zero emissions. Ten years later, I am happy to report that manufacturers of diesel engines have met the challenge. Along with cleaner diesel fuel, they are now delivering technology that is near zero emissions for highway trucks, and the same kind of technology is coming for the off-road engines and equipment as well.

Thanks to these advancements, in some U.S. cities the air coming out of a class 8 heavy-duty clean diesel truck is cleaner than the air going into it. Not only are today's diesel truck engines near zero emissions, they are, on average, using 5 percent less fuel.

There are more challenges ahead and industry is working with EPA and NHTSA right now on the first-ever greenhouse gas rules for these vehicles.

A hallmark of diesel engines has been the process of continuous improvement, each year making advancements in technology. The new generation is certainly far away from the older generation. I would like to focus the rest of my remarks on the opportunity to make improvements in existing engines and equipment, and we believe they are significant ones.

Mr. Chairman, you and other congressional leaders recognized early on, back in April, 2004, this opportunity, and the value and importance of diesel engines and equipment to the economy. You brought together disparate groups and organizations to work together to produce what we know today as the Diesel Emissions Reduction Act. You cited its benefits, $13 of return on investment for

every $1 put into it, and a leverage factor of $3 on the table after $1 of Federal investment.

This is a really important program because it addresses the things that you work hard on here every day, the big Es: environment, energy and the economy. In just the first year alone, DERA resulted in 46,000 fewer tons of NOx emissions, 465,000 fewer tons of CO_2, and saved 3.2 million gallons of diesel fuel, which resulted in a savings of $8 million to our economy.

Now, imagine for a moment, if you might, what we could have achieved had DERA been fully funded over those first 5 years. That would have been a $1 billion Federal investment, leveraged to a $3 billion investment; thousands more contractors, truckers and others would have upgraded their engines and equipment, creating demand for the technology and, in turn, creating jobs in manufacturing and service segments, resulting in tens, if not hundreds of millions of gallons of fuel savings and hundreds of thousands of more tons emissions could have been reduced.

We have heard from Mr. Parfitt about the success stories of DERA and there are 49 States' other stories just like that. To make sure we keep having these success stories, we have a serious challenge ahead, and that is to restore the Diesel Emissions Reduction Act and continue this unique program.

DERA is the one program that should be accelerated, not terminated. There is a well-established continuing need for DERA. As you have just heard from Bob Lanham, the recent recession has substantially altered the economic landscape of many large and small businesses and industries that use diesel technology as the tools of their trade. Equipment acquisition and retention cycles have been adversely affected. For example, according to 2010 data from R.L. Polk, over the last 5 years, the average age of a class 8 commercial truck has increased by 1.7 years. As a result, the need for upgrading engines and equipment is more important today than it was 5 years ago.

Voluntary incentive-based programs are important policy tools for the future. Given the economic circumstances, we believe that voluntary programs make the most sense for moving forward with upgrading and modernizing existing engines and equipment. Manufacturers of diesel engines and equipment recognize and respect the significant value that contractors, truckers and other owners place in their equipment and the decisions surrounding its purchase and use.

Equipment managers went flexibility and choice. They want the ability to manage their business in a way that enables them to be good employers, efficient producers and good stewards of the environment. A voluntary incentive-based program has proven to be the best way to achieve these goals.

In conclusion, diesel's combination of power density, fuel efficiency, performance reliability, durability and environmental performance are still unmatched today by any other fuel or technology. Clean diesel technology is now the new standard and is positioned to play a role in our sustainable future.

With significant opportunities for preserving the value and performance of the many existing out there, DERA works for many reasons. Because it is voluntary and incentive-based, it offers car-

rots instead of sticks. It provides flexibility to both States and owners and operators of equipment. It is based on a results-oriented competitive process. It has fostered understanding of the practical issues that lie at the intersection of environmental goals and real-world business decisions, making distinctions between what is technologically possible and economically practical. It encourages private and local investment, and finally, rewards the American public with a substantial return on its investment, as much as $13 for every dollar contributed.

Congress and you, Mr. Chairman, have played a visionary role in establishing this voluntary incentive-based program that has proven to be wildly effective. If ever a program made sense to continue and has the sustained support of environmental, labor, public health and industry groups, this is the one.

We hope that we can work together to retain and restore DERA.

[The prepared statement of Mr. Schaeffer follows:]

Federal Efforts to Protect Public Health by Reducing Diesel Emissions

Statement of the
Diesel Technology Forum
Allen Schaeffer, Executive Director

Before the

United States Senate
Committee on Environment and Public Works
Subcommittee on Clean Air and Nuclear Safety
May 12, 2011

INTRODUCTION
Good Afternoon. My name is Allen Schaeffer and I serve as Executive Director of the Diesel Technology Forum, a not for profit educational group representing the nation's leading diesel engine, vehicle and equipment manufacturers, fuel refiners and suppliers, and those that manufacture emissions control technology, and allied organizations. We appreciate the opportunity to appear today before the Subcommittee on the issue of Federal Efforts to Improve Public Health by Reducing Diesel Emissions.

Because of its unmatched combination of power, performance and energy efficiency, diesel technology is the workhorse of the US and global economy, powering over 90 percent of commercial trucks, more than three-fourths of all transit buses, 100 percent of freight locomotives and marine work boats and two-thirds of all farm and construction equipment. Diesel engines are also found in back up emergency electrical generators, stationary pumps and other industrial equipment. Diesel powered cars and SUVs also make up a growing percentage of new passenger vehicles sold nationwide in all 50 states. In fact, economical clean diesel is making a bigger contribution toward reducing oil consumption and greenhouse gases more than any other affordable drive technology today.

Our testimony will focus on two areas; traditional regulatory approaches for new engines, fuels and vehicles; and those approaches that have involved non-traditional voluntary incentive based approaches. The main focus of my remarks here today will be on the efforts to reduce emissions from the existing fleet of diesel engines and equipment.

II. NEW CLEAN DIESEL ENGINE TECHNOLOGY IS NEAR ZERO EMISSIONS

In 2000, EPA established a regulatory pathway for highway diesel engines to reach near zero emissions in a ten year period. In 2004, regulations were also established for the many categories of off-road diesel engines and equipment setting forward a similar set of emissions goals. A graphical depiction of the changes in emissions levels for both highway vehicles and one category of off-road engines are found in the Appendix to this testimony. These last 10 years have been called the decade of clean diesel: a system of cleaner engines, low-sulfur fuels, and advanced emissions control technologies ultimately deployed for 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 on average of 5 percent less fuel. Thanks to these advancements, in some US cities, the air coming out of a class 8 heavy-duty clean diesel truck is cleaner than the air going into it.

Similar reductions in emissions of particulates and oxides of nitrogen are now beginning to fall in place over the next 3 years (2011-2014) for the wide range of off-road engines found in everything from small construction equipment and farm machinery to freight locomotives, marine vessels, work boats and very large off-road machines and mining equipment. In fact, this year 2011 marks the debut of a number of the "fourth generation" or Tier 4 emissions level machines in off-road applications.

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 efforts known as the Advanced Combustion Emissions Study (ACES) carried out through the Health Effects Institute and Coordinating Research Council are evaluating performance of the 2007 generation clean diesel heavy-duty engines. Phase I results released in 2009 showed emissions levels to be as much as 90 percent lower than 2004 generation technology.

Finally in the category of reducing diesel emissions from new technology, truck and engine makers are working with EPA and NHTSA on the first-ever regulation of greenhouse gas and fuel consumption standards for medium- and heavy-duty commercial vehicles, expected to be finalized this July. This final rule will establish standards for these classes of vehicles over the next decade that will lead to further improvements in diesel engine efficiency as well as vehicle attributes such as aerodynamics and tires. An overall reduction in fuel consumption typically translates into lower overall vehicle emissions.

Today, new diesel buses, trucks and other engines are more than 90 percent cleaner. These new diesel engines operate smoke-free, have created thousands of new jobs in the hard-hit engine manufacturing sector and elsewhere, and are helping to save escalating fuel costs by operating more efficiently. This national clean diesel effort has historically enjoyed broad, bipartisan support. How broad and bi-partisan? President William J. Clinton signed the first regulation to clean up diesel trucks and buses in 2001, and President George W. Bush signed the next regulation to clean up diesel construction and farm equipment in 2004, and President Barack Obama initiated the rule for reducing GHG emissions from medium and heavy duty trucks.

III. MODERNIZING AND UPGRADING EXISTING ENGINES AND EQUIPMENT: CLEAN DIESEL RETROFIT AND THE IMPORTANCE OF RETAININGN THE DIESEL EMISSIONS REDUCTION ACT (DERA).

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.

"Diesel retrofit" has become a term of art reflecting a number of strategies and choices for modernizing and upgrading existing diesel engines. These primarily include retrofitting with an emissions control device; repowering, or replacing, an older engine with a new one; rebuilding an older engine to a higher emissions tier level; refueling with cleaner fuels; or replacing an entire vehicle or machine with a newer one.

Senator Carper, you and other Congressional leaders recognized as early as April 2004 the value and potential of clean diesel technology and the opportunity for upgrading existing engines. You brought together an unusual array of 32 groups to provide input on what was to become the Diesel Emissions Reduction Act (DERA) in 2005, not directing EPA toward a regulatory mandate—but instead a voluntary incentive based program authorizing up to $200 million annually. Over 600 groups and organizations have signed on in support of this program.

DERA has improved America's air quality by modernizing older diesel engines and equipment through engine replacements and retrofits. DERA addresses all of the "big E's – environment, energy and economy. In its first year alone DERA resulted in 46,000 less tons of NOx; 464,000 less tons of CO_2 as well as saving 3.2 Million gallons of diesel fuel, resulting in an economic gain of $8 million to the economy.

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 three dollars in state, local, or private funding for every federal dollar. It's hard to find a better investment in public health.

The DERA Program has benefitted every state including those represented by the 11 members of this Subcommittee. 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 WY DEQ used a combination of funds including a $1.1M EPA grant as part of a $2.3M 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.

Despite DERA's reauthorization for an additional 5 years in the 111th Congress, this highly successful voluntary incentive based program was proposed for termination in the Administration's FY2012 budget proposal. This came as a shock to the legions of industry, environmental, health, labor and governmental organizations that continue to support it. There is strong support in House evidenced by the fact that they voted 372 to 52 in Dec. 2010 not to reallocate DERA money to other EPA programs.

This proposed termination report from OMB is in our view based on inaccurate information and misinterpretation of the program. For example, with regards to continued need, by the end of 2011, it is estimated that roughly only 50,000 diesel engines out of the 11 million that exist will have been replaced or retrofitted with DERA funds *(note this does not include FY09/FY10 funds).* For the reasons stated previously, the recession has substantially impacted the acquisition of new lower emitting technology into the marketplace, and will substantially delay the benefits of using the new technology.

This proposed termination language in the OMB Budget document is inconsistent with the public statements by the Administration. In March 2nd testimony before the full Senate Environment and Public Works Committee, EPA Administration Jackson acknowledged continued need for the DERA program.

DERA's continuation is important because it provides the seed funding for thousands of fleet owners, farmers, and other diesel users to buy the new engines, retrofits, and technologies. In turn, this is unlocking the potential of America's engine makers and equipment innovators. U.S. engine companies are producing the most durable, efficient, and cleanest diesel engines in the world and other clean diesel manufacturers are making the catalysts and filters that can make older diesel engines much, much cleaner during the years of service that they have left.

DERA IS A PROGRAM THAT WORKS. It works because it:

- enjoys bipartisan support in Congress and a uniquely broad-based coalition of followers and supporters numbering over 500 organizations;
- Is voluntary and incentive based, offering carrots --- instead of sticks --- to interested parties to participate.
- Allows owners to choose verified technology that works best for their circumstances; not all technologies work on all equipment;
- gives states the flexibility to apply DERA funding based on local emissions inventories to improve air quality;
- provides for a results oriented, competitive process to ensure the greatest level of success;
- 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 practicable.

- Encourages private and local investment through the provision of matching funds to leverage the federal incentive dollars by as much as 3 to 1.
- Rewards the American public with a substantial return on its investment - as much as $13 dollars in benefits for every dollar invested, and as the National Academies of Science have said is among the most cost-effective air quality projects.

There is a well-established and Continuing Need for DERA
The recent recession has substantially altered the economic landscape of many large and small businesses in industries that are highly dependent on diesel technology as the tools of their trade. In addition to the thousands of construction and trucking companies that simply went out of business, those that survived delayed their normal cycle for capital investments. New truck sales declined dramatically, construction machine sales fell to their lowest levels in years and the age of the existing fleet grew. According to 2010 data from R.L.Polk, over the last 5 years the average age of a class 8 tractor trailer has increased by 1.7 years. As a result, the need for upgrading existing diesel engines and equipment is more important today than five years ago.

Voluntary Incentive-based programs are especially important policy tools for the future.

While signs of an economic recovery are more apparent today, many owners and operators of diesel equipment in the construction, agriculture and transportation industries are still not benefitting from these small gains, thus their new equipment acquisition and retention cycles may be extended for the foreseeable future. A continuing commitment to the voluntary, incentive-based DERA program would promote the realization of continued progress and shared investment towards clean air goals across all sectors of our economy.

Manufacturers of diesel engines and equipment recognize and respect the significant value that contractors, truckers and other diesel equipment owners place in their equipment, and the factors influencing their fleet management decisions. Equipment managers want the ability to manage their business in a way which enables them to be good employers, efficient producers and good stewards of the environment, and a voluntary incentive-based program has proven to be the best way to achieve those mutual goals.

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 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 cleaner diesel fuel and low emissions diesel engine technology.

There are continued opportunities and clearly identified need for voluntary incentive based programs to modernize and upgrade existing engines and equipment. Economic conditions today that began over the last 3 years in the construction and trucking sector have had a substantial negative impact on the ability of many businesses to upgrade their existing fleet of technology, increasing the average age of fleet equipment, and increasing the prospect that older

engines and equipment will be used for even longer than before.

Congress has played a visionary role in establishing and funding a voluntary-incentive based program – the Diesel Emissions Reduction Act (DERA) to encourage the modernizing and upgrading of existing engines and equipment.

Although DERA funds have leveraged other dollars in support of additional retrofits, there is no question that the number of engines retrofitted or replaced to date represents only the tip of the iceberg. Now, as the recession keeps diesel engines on the road and jobsite longer and longer, it's even more important to help fund programs to retrofit and clean up those older engines. If ever a program made sense and had the support of environmental, labor, public health and industry groups, this is the one.

Since 2005, DERA has been a smart budget choice and a successful program to clean up diesel school buses, trucks, construction equipment and farm engines across the nation. With 11 million older diesel engines still on our roads, construction sites, and farms, Congress needs to continue funding DERA.

Thank you for the opportunity to appear today and I would be happy to answer any questions.

Appendix

Figure 1: Reductions of Nitrogen Oxides and Particulate Matter Emissions from heavy-duty diesel trucks.

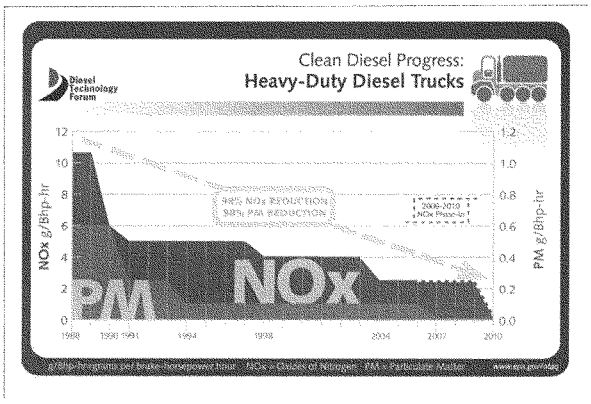
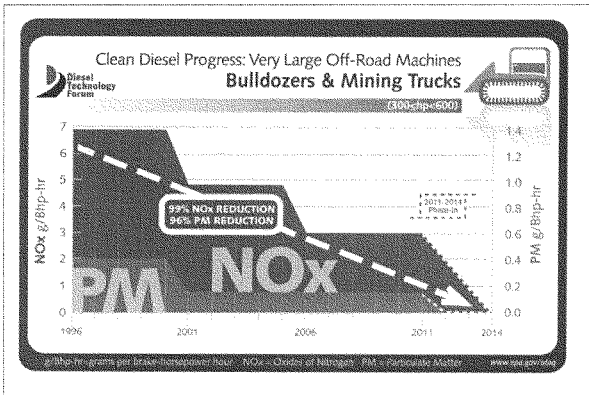


Figure 2: Reductions in emissions of nitrogen oxides and particulate matter in large off-road machines (bulldozers and mining trucks 300hp - 600hp)



5291 Corporate Drive -- Suite 102 -- Frederick, MD 21703 301-668-7230

August 18, 2011

The Honorable Barbara Boxer, Chairman
The Honorable James Inhofe, Ranking Member
United States Senate
Committee on Environment and Public Works
Washington DC 20515

Dear Chairman Boxer and Senator Inhofe,

Thank you for the opportunity to testify before the Committee on Environment and Public Works on May 12, 2011 on the matter of Federal Efforts to Protect Public Health by Reducing Diesel Emissions. In response to your letter request dated August 4, 2011, I offer the following response.

QUESTION: Retrofitting diesel engines to make them cleaner already generates thousands of American Jobs. Can you comment on the job creation potential of the Diesel Emissions Reduction Act and the Clean Construction Act?

ANSWER:

Thank you for your question regarding the job creation potential for the Diesel Emissions Reduction Act and the Clean Construction Act.

As you know, predicting future job creation potential for any program is difficult if not impossible, particularly in today's economic climate. The best guess would come from extrapolating from past program experience, however this also poses difficulties because of the different types of jobs associated with diesel retrofit projects (i.e. equipment manufacturing, sales & servicing) and the number of industries which undertake such projects (trucking, construction, farming, etc.). Nevertheless, there are a number of facts and statistics which allow me to confidently affirm that these programs will support additional, high-wage jobs in the U.S. economy.

As you know, there are various types of retrofit projects, including retrofitting with exhaust control devices, repowering and rebuilding engines, replacing older vehicles with new, cleaner ones ahead of the normal turnover rate, and the application of idle reduction devices. Each of these cases lead to economic activity in the manufacturing (including all supply chain activity) and the sale/ installation of this equipment.[1]

[1] Although it is difficult to determine the spread of funds by DERA by retrofit type – a window into this spread can be found by looking at the ARRA projects that were funded in EPA Region 5, one of the largest and more active regions. According

In looking at exhaust control retrofits, the Manufacturers of Emissions Control Association recently reported that its members, which represents a majority of the industry, sold 24,640 diesel retrofit devices in 2010 and that this number was similar to sales data for the last several years. This is in addition to the sale of approximately 2 million diesel particulate filters manufactured for new heavy-duty trucks which have been sold since 2007, a portion of which were likely sold as replacements for older vehicles funded through a retrofit program. Each of these components support jobs across the supply chain benefitting a wide range of states ranging from mining of minerals, production of components, application of catalysts, mounting, integration and installation of the final product.

Another popular retrofit solution is the use of idle reduction equipment. Although national figures are unavailable, these projects accounted for 29% of the retrofit projects funded in the Midwest through the DERA-funded provided under the American Recovery and Reinvestment Act. National figures may be higher since the investment cost for these retrofits are usually recouped in a relatively short period of time. The state of Wisconsin recently reported that this retrofit solution accounted for 59% of the diesel retrofits done in that state.[2]

Idle reduction companies are fairly small in size with only a few auxiliary power unit (APU) manufacturers employing an average of 100 employees. Although over 2,300 companies sell, install and maintain APUs (which only account for 12% of all idle reduction technologies), most generally have less than 30 employees. Although it is difficult to know how much of their business depends on the diesel retrofit market, it is likely to be a larger percentage than in the exhaust control industry.[3]

Employment attributed to replacement retrofits are even harder to estimate, especially since some of these projects result in the purchase of newer used equipment, particularly in the port areas due to the high cost of new heavy-duty diesel vehicles. That said, there are several cases where fleet owners are retiring vehicles early and using the retrofit funds to purchase diesel-hybrid trucks and buses.

According to a study by Duke University, there are approximately 25 US-based truck makers and 15 US hybrid system developers actively involved in developing hybrid trucks. This study notes that hybrid truck makers have largely been able to use the same personnel on the same production lines as conventional trucks to date, however any significant increase in production volume would likely translate

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to that collaborative, approximately 17% of ARRA funded retrofits went to replacement, 22% to using exhaust control devices, 29% to idle reduction, and 27% to repowers.

[2] Wisconsin's Clean Diesel Grant Programs Summary, May 2011 Wisconsin Dept .of Natural Resources, Publ AM-404 2011

[3] 2011According to the Center on Globalization, the current market penetration for idle reduction technologies is estimated at 36% of the sleeper cab market, of which approximately 12% are APUs. U.S. APU manufacturers are relatively small (under 100 employees). Over 2,300 companies across the country provide APU retail, installation, and maintenance services. Most of these vendors are dealers, service centers, and installation centers. These vendors are generally small businesses with fewer than 30 employees. Although only a one state example, idle reduction technologies accounted for 59% of the number of retrofitted vehicles/equipment done in the state. (note that the state has a specific truck idle reduction program so this may not be representative of other states).

not only into a commensurate increase in employment but also ripple effects among a wide range of component suppliers.[4]

Over the last several months the Diesel Technology Forum has been conducting an economic analysis of the diesel industry and we are planning to release the results of that study near the end of September. While that study looks more broadly at the diesel industry, retrofit projects are part of work driving this sector, one which provides jobs which contribute twice as much to the national income as the average worker and paying wages which are approximately 60% higher. Altogether the diesel manufacturing and fuels industry supports almost half a million U.S. jobs. When looking at the relative shares of diesel vehicles, equipment and fuel sold, and the number of employees within selected subsectors, the diesel sales, repair and servicing sector employed 764,000 individuals."

The Clean Construction Act ("CCA") would create further demand for clean diesel emissions control technology through retrofitting of existing engines and equipment to be used in infrastructure construction projects. The potential for job growth from the CCA would be in direct proportion to the size and scope of any federal and state construction projects. Without a major federal initiative in this area, the CCA is unlikely to have a measurable effect. It would be safe to say that larger projects would require the use of more equipment and more clean diesel technology upgrades that would create trickle down demand for more devices and manufacturing, service and installation activity in the economy.

Thank you again for your leadership on these issues and the opportunity for the Diesel Technology Forum to testify before the Committee. We are available to discuss these responses further at your request.

Very truly yours,

Allen R. Schaeffer

Allen R. Schaeffer
Executive Director

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[4] According to UCS's Climate 2030 report, investments in advanced technologies would create jobs in the manufacturing sector, as companies hire more engineers and skilled workers to design and assemble added components for heavy duty vehicles. In fact, analysis of the *Climate 2030* scenario shows that cost savings from the use of more-efficient trucks would create 63,000 jobs nationwide in 2020, and 124,000 jobs in 2030, while GDP would expand $4 billion by 2020 and $10 billion by 2030.15 The job gains would occur across most sectors of the economy, from manufacturing and trucking to retail and other services. These job increases would more than offset job losses stemming from declining demand for fuel due to more-efficient trucks (Figure 2) The largest portion of these increased jobs would come in the Services sector. See page 5 of Report Delivering Jobs.

Senator CARPER. From your lips to God's ears. We will hope that the request will be granted. Again, I just want to say, he is not here, but George Voinovich, as you know, played a huge role in getting DERA on the table, out there, something to be debated and voted on.

I remember he came to me, Senator Barrasso, he came to me I want to say maybe 3 or 4 years ago and said he had this idea on the Diesel Emission Reduction Act. He was looking for a Democrat cosponsor to be the lead Democrat, and it took about 5 minutes to convince me. We introduced the bill and within 40 days it was adopted into law. I have never seen anything go that fast from a conversation to being enacted into law, so pretty amazing. It had the kind of support there which included not just George and I, who worked on a lot of stuff together, but Jim Inhofe and Barbara Boxer; just an extraordinary partnership.

So we have got to keep it going.

All right, I almost said Senator Schneider, Conrad Schneider.

STATEMENT OF CONRAD SCHNEIDER, ADVOCACY DIRECTOR, CLEAN AIR TASK FORCE

Mr. SCHNEIDER. Mr. Chairman, thank you very much, Senator Barrasso. Good afternoon. My name is Conrad Schneider. I am the advocacy director of the Clean Air Task Force, and I appreciate the opportunity to speak to you today.

Based in Boston, we are a national nonprofit environmental advocacy organization whose mission includes reducing adverse health and environmental impacts from diesel engines.

Today, I would like to talk to you about two ways the Federal Government can reduce the threat posed by diesel exhaust. One is fund DERA and two is enact the Clean Construction Act of 2011 as part of the next transportation reauthorization bill.

DERA is a highly successful program, as you have heard, and enjoys broad bipartisan support. Clean Construction, which now has been endorsed by us, the Clean Air Task Force and the Associated General Contractors, provides a unique opportunity to integrate and streamline clean air measures into project delivery, while delivering support for contractors to clean up dirty equipment and protect public health.

We believe that devoting up to 1 percent of the cost of transportation projects to clean air is not too much to ask to help protect the health of our citizens. Mr. O'Keefe covered the health effects of diesel, so I won't repeat them here except to say that fine particle pollution produced by diesels causes 21,000 deaths per year, according to our report from 2005, Diesel and Health in America, and nationally, diesel exhaust poses a cancer risk that is three times higher than the risk from all the air toxics tracked by EPA combined.

With respect to DERA, while the U.S. EPA has mandated tighter emissions rules on new diesel engines, emissions from the current fleet remain uncontrolled. As the Diesel Technology Forum has noted, the rate of turnover of the fleet to new cleaner engines has been slowed due to the recession, as sales of new cleaner diesels have plummeted. As a result, older, dirtier diesels will be doing

more work and be with us for longer than expected, which means more pollution.

In 2005, Congress sought to provide States and localities with new tools to help meet Clean Air Act requirements. DERA was passed overwhelmingly and quickly as a federally sponsored voluntary retrofit initiative to reduce these emissions. The program was initially authorized at $200 million a year for 5 years, or $1 billion. Since that time, about half that amount has been appropriated for DERA, $300 million through the Recovery Act.

However, the President's 2012 budget has proposed to zero out the program. We believe that this would be a mistake. Since its inception, EPA estimates that the Federal appropriations for DERA has cleaned up 50,000 diesel vehicles, resulted in the reduction of thousands of tons of fine particulate matter, and created 9,000 jobs.

The continued need for DERA has recently been acknowledged by the Obama administration. In her May 9 letter, Senator Carper, to you, EPA's Assistant Administrator McCarthy admitted that continuing DERA would provide a cost-effective way to address the existing fleet and will deliver immediate public health benefits. EPA Administrator Jackson recently testified similarly in answer to questions before the full committee.

Throughout the program's history, DERA has enjoyed strong bipartisan support, most recently demonstrated last December when Congress took the extraordinary step of reauthorizing DERA during the lame-duck session. DERA is backed by a uniquely broad coalition of environmental, public health, industry, labor, State and local government groups. States and localities, and all of us, support additional funding for DERA. It is our hope that Congress will continue to provide leadership on this issue and we urge you to allocate $50 million to DERA for Fiscal Year 2012, which is equal to the 2008 level.

The DERA coalition has also requested that Congress support the President's budget request of $300 million for State and local air agency grants in helping them to meet Clean Air Act requirements and discharge them.

With respect to clean construction, one sector that has been underserved by DERA and other existing programs is the construction sector. Construction contractors are not always well positioned to take advantage of these programs, which have required a competitive grant process.

There is a better way, we believe: clean construction as part of project delivery. Modern pollution control equipment is being used today across the country in building transportation projects that ensure that no harm is done to the air quality in communities where these projects are being accomplished.

Originating with the Big Dig in Boston, and in the Lower Manhattan reconstruction after the attacks of 9/11, today clean construction contract specs have been adopted by New York City, New York State, Illinois, Rhode Island and most recently by Mayor Daley in the city of Chicago and by Governor Christie in New Jersey.

Senator Carper, you crafted the Clean Construction Act of 2011, which will reduce these emissions by helping to clean up on- and off-road construction equipment working on federally funded trans-

portation infrastructure projects located in areas with poor air quality. The bill accomplishes this by ensuring that diesel construction equipment employs modern engine and pollution-reduction technology through a requirement and funding.

As a policy road map, the Clean Air Task Force and Associated General Contractors distilled a set of clean construction principles based on our experiences at the State level, and those were embodied in your bill and we both endorse and congratulate you on the introduction of the bill today. We recommend that Congress adopt this approach as part of the transportation bill reauthorization to help provide retrofit re-power, upgrade equipment, and provide maximum achievable reduction of diesel particulate matter as an eligible project expense through a change order process, a process with which States and contractors are familiar.

In conclusion, let me just say that to maintain strict cost controls, the bill requires that no more than 1 percent of a transportation project's cost must be used by States to upgrade this equipment. The Clean Air Task Force has commissioned case studies on 10 projects and the results have consistently shown that project equipment can be cleaned up for no more than 1 percent to 1.5 percent of the project cost.

So in conclusion, let me just say thank you for the opportunity to testify in support of clean diesel in these two important Federal statutes, and I look forward to working with you in securing funding for DERA and including clean construction in our Nation's next transportation bill.

Thank you.

[The prepared statement of Mr. Schneider follows:]

BEFORE THE
CLEAN AIR SUBCOMMITTEE OF
THE ENVIRONMENT AND PUBLIC WORKS COMMITTEE
UNITED STATES SENATE

FEDERAL EFFORTS TO PROTECT PUBLIC HEALTH BY REDUCING DIESEL EMISSIONS

TESTIMONY OF CONRAD G. SCHNEIDER
ADVOCACY DIRECTOR, CLEAN AIR TASK FORCE

May 12, 2011

Summary of Testimony

Mr. Chairman, ranking member Barrasso, members of the Clean Air Subcommittee of the Senate Environment and Public Works Committee, good afternoon. My name is Conrad Schneider, Advocacy Director of the Clean Air Task Force. I appreciate the opportunity to speak to you today. Based in Boston, the Clean Air Task Force is a national non-profit, environmental advocacy organization whose mission includes reducing the adverse health and environmental impacts of diesel engines. Our staff and consultants include scientists, economists, MBA's, engineers, and attorneys dedicated to reducing atmospheric pollution through research, advocacy, and private sector collaboration.

Today I would like to talk about two ways the federal government can reduce the threats posed by diesel exhaust: (1) fund the Diesel Emission Reduction Act (DERA); and (2) enact the Clean Construction Act of 2011 as part of the next Transportation reauthorization bill. DERA is a highly successful program and enjoys broad bi-partisan support. Clean Construction, which has been endorsed by the Clean Air Task Force and Associated General Contractors, provides a unique opportunity to integrate and streamline clean air measures into the project delivery process while providing support for contractors to clean up dirty equipment and protect public health. We believe that devoting up to one percent of the cost of transportation projects to clean air is not too much to help protect the health of our citizens.

The Threat Posed By Diesel Pollution

Fine particle pollution produced by diesel engines causes 21,000 deaths a year, according to our 2005 report *Diesel and Health in America: The Lingering Threat.* Diesel engines are known for their durability, but older engines emit a toxic mixture of particles, metals, and gases, including over 40 "hazardous air pollutants" as classified by EPA. Nationally, diesel exhaust poses a cancer risk that is 3 times higher than the risk from all other air toxics tracked by EPA *combined.* Premature death, lung cancer, heart attack, stroke, diabetes, respiratory distress and lost days from school and work have all been tied to diesel pollution, and reducing this risk is a win for everyone. Estimates show that for every dollar spent on reducing particulate matter pollution from diesel engines, $13 would be avoided in health damages.

Moreover, as a global warming pollutant, black carbon in diesel pollution is about 2000 times more potent than carbon dioxide (CO2). Diesels account for over half of the US black carbon emissions. Retrofitting diesel engines with filters is one of the few actions that will have immediate climate benefits, complementing long-term efforts to reduce CO_2 emissions.

Diesel exhaust is a toxic mixture of tiny fine and ultrafine carbon soot particles and gases from the burning of diesel fuel and lubricating oil. These microscopic carbon soot particles absorb metals and toxic gases in the exhaust and deliver them to your lungs. At highest risk are commuters and people living or working in proximity to truck traffic, construction and other heavy equipment.

The Diesel Emissions Reduction Act

While the U.S. EPA has mandated tighter emissions rules on new diesel engines, emissions from most of the current fleet of 11 million heavy-duty diesel engines remain uncontrolled. CATF's diesel advocacy focuses on cleaning up this existing fleet of diesel engines, which are expected to remain in operation for decades to come. As the Diesel Technology Forum has noted, the rate of turnover of the fleet to new, cleaner engines has been slowed by the recession as sales of new diesels have plummeted. As a result, older, dirtier diesels will be with us for even longer than expected. More years and more miles by older, dirtier trucks will mean more pollution, so we need tools to deal with pollution from the existing fleet.

In 2005, Congress and the Administration sought to provide states and localities with new tools for meeting National Ambient Air Quality Standards (NAAQS) and reducing human exposure to harmful diesel emissions. Passed with overwhelming support from government, industry and environmental organizations as part of the Energy Policy Act of 2005, the Diesel Emissions Reduction Act (DERA) established a federally sponsored voluntary retrofit initiative to reduce emissions generated by America's aging diesel fleet.

The program was authorized for $200 million/year for 5 years or $1 billion. Since that time, $469.2 million has been appropriated to the Diesel Emissions Reduction Program (DERP), $169.2 million in annual appropriations and $300 million through the American Recovery and Reinvestment Act. For FY2011, $50 million has been appropriated for DERA, however, the President's FY2012 budget has proposed to zero out the program. That would be a mistake.

Since its inception, EPA estimates that the federal appropriations for DERA ($469.2M) has cleaned up 50,000 diesel vehicles, resulted in the reduction of thousands of tons of fine particulate matter, and created nearly 9,000 jobs.

The continued need for DERA has recently been acknowledged by the Obama Administration. In her May 9, 2011 letter to Senator Carper, EPA's Assistant Administrator for Air and Radiation, Regina McCarthy, admitted that continuing DERA would provide a cost-effective way to address the existing fleet of heavy-duty diesel engines and will deliver immediate public health benefits. EPA Administrator Jackson recently testified similarly in answer to questions before the full EPW committee.

Throughout the program's history, DERA has enjoyed strong bipartisan support most recently demonstrated in December 2010 when Congress took the extraordinary step of reauthorizing DERA during the "lame duck" session.

DERA is backed by a uniquely broad coalition of environmental, science-based, public health, industry, labor and state and local government groups. States and localities and environmental, health, user and industry groups all support funding for diesel retrofits and clean air agencies because it is sound environmental, health and budgetary policy. It is our hope that Congress will continue to provide leadership on this issue and we urge you to allocate $50 million for DERA in Fiscal Year (FY) 2012 (equal to FY 2008 levels). The DERA Coalition has also requested that Congress support the President's budget request of $305.5 million for state and local air quality grants in FY 2012 to support state and local air quality agencies in carrying out their responsibilities such as attaining and maintaining National Ambient Air Quality Standards, implementing clean air rules, and addressing toxic air pollutants.

Clean Construction in the Transportation Bill

One sector that has been underserved by DERA and other existing programs is the construction sector. Construction contractors are not always well positioned to take advantage of these programs, which have required a competitive grant application process. There is a better way: Clean Construction as part of project delivery.

Modern pollution control equipment is being used across the country in building clean transportation projects to ensure that no harm is done to the air quality in communities during infrastructure projects. Originating with the "Big Dig" and the Lower Manhattan Reconstruction after 9/11, today Clean Construction contract specifications have been adopted by New York City and New York State, Illinois and Rhode Island, and most recently by Mayor Daley in the City of Chicago and by Governor Christie in New Jersey.

Taking the lead from these states and working with the contractors and environmental community, Senator Carper has crafted the Clean Construction Act of 2011, which will reduce the amount of harmful particulate matter emissions emitted by older diesel on- and off-road construction equipment working on federally-funded transportation infrastructure projects located in areas with poor air quality. The bill accomplishes this by ensuring that diesel construction equipment employs modern engine and pollution reduction technology through a requirement and funding. As a policy roadmap, the Clean Air Task Force (CATF) and the Associated General Contractors (AGC) distilled a set of Clean Construction Principles based on our experiences with state efforts that are embodied in the Clean Construction Act of 2011. Both our organizations endorse the Clean Construction Act and we congratulate Senator Carper on the introduction of the bill today. We recommend that Congress adopt this approach

as part of the Transportation Bill re-authorization. The bill provides funding to retrofit, repower and upgrade equipment to provide the maximum achievable reduction of diesel particulate emissions as an eligible project expense.

The bill would achieve this through a funded requirement for the installation of emission control technology in PM2.5 designated non-attainment and maintenance areas an eligible project expense through a change order, a process that both State DOT's and contractors are familiar with and utilize. The goal is to streamline a process that integrates clean air benefits into project delivery.

To maintain strict cost controls, the bill requires that no more than one percent of a transportation project's cost must be used by States to upgrade dirty equipment. CATF has commissioned case studies on ten projects, five that have been completed utilizing Clean Construction and five that have projected the use of Clean Construction on projects. The results have consistently shown that project equipment can be cleaned up for no more than one to one and one-half percent of project cost. This provision is expected to allocate approximately $200 million per year for clean equipment. CATF estimates that the bill will eliminate 9,000 tons of PM2.5 emissions and avoid nearly 1,000 premature deaths and other adverse health effects.

Thank you for the opportunity to testify in support of clean diesel in two important federal statutes. I look forward to working with the subcommittee in securing funding for DERA and including Clean Construction in our nation's next Surface Transportation Reauthorization Bill.

Mr. Chairman, ranking member Barrasso, members of the Clean Air Subcommittee of the Senate Environment and Public Works Committee, good afternoon. My name is Conrad Schneider, Advocacy Director of the Clean Air Task Force. I appreciate the opportunity to speak to you today. Based in Boston, the Clean Air Task Force is a national non-profit, environmental advocacy organization whose mission includes reducing the adverse health and environmental impacts of diesel engines. Our staff and consultants include scientists, economists, MBA's, engineers, and attorneys dedicated to reducing atmospheric pollution through research, advocacy, and private sector collaboration.

Today I would like to talk about two ways the federal government can reduce the threats posed by diesel exhaust: (1) fund the Diesel Emission Reduction Act (DERA); and (2) enact the Clean Construction Act of 2011 as part of the next Transportation reauthorization bill. DERA is a successful program and enjoys broad bi-partisan support. Clean Construction, which has been endorsed by the Clean Air Task Force and Associated General Contractors, provides a unique opportunity to integrate and streamline clean air measures into the project delivery process while providing support for contractors to clean up dirty equipment and protect public health. We believe that devoting up to one percent of the cost of transportation projects to clean air is not too much to help protect the health of our citizens.

1. The Risk Posed by Diesel Exhaust

Fine particle pollution produced by diesel engines causes 21,000 deaths a year, according to our 2005 report *Diesel and Health in America: The Lingering Threat.* Diesel engines are known for their durability, but older engines emit a toxic mixture of particles, metals, and gases, including over 40 "hazardous air pollutants" as classified by EPA. Nationally, diesel exhaust poses a cancer risk that is 3 times higher than the risk from all other air toxics tracked by EPA *combined.* Premature death, lung cancer, heart attack, stroke, diabetes, respiratory distress and lost days from school and work have all been tied to diesel pollution, and reducing this risk is a win for everyone. Estimates show that for every dollar spent on reducing particulate matter pollution from diesel engines, $13 would be avoided in health damages.

Moreover, as a global warming pollutant, black carbon in diesel pollution is about 2000 times more potent than carbon dioxide (CO2). Diesels account for over half of the US black carbon emissions. Retrofitting diesel engines with filters is one of the few actions that will have immediate climate benefits, complementing long-term efforts to reduce CO_2 emissions.

What is Diesel Exhaust?

Diesel exhaust is a toxic mixture of tiny fine and ultrafine carbon soot particles and gases from the burning of diesel fuel and lubricating oil. These microscopic

carbon soot particles absorb metals and toxic gases in the exhaust and deliver them to your lungs. At highest risk are commuters and people living or working in proximity to truck traffic, construction and other heavy equipment.

Diesel Pollution Kills

Using EPA's approved methodology, my organization has estimated that diesel particulate matter soot kills an estimated 21,000 Americans every year.[1] Medical researchers are just beginning to understand how combustion particles can cause fatal diseases such as cancer, stroke, and heart attacks. When inhaled, these tiny, poison-laden particles may be capable of directly triggering a response from the cardiovascular system or crossing the blood-barrier from lungs into the bloodstream, delivering them to internal organs.

- Exposure to particles is a well-known cause of premature death as documented in the two largest long-term air pollution studies ever conducted, the Harvard Six Cities Study and the 150-city American Cancer Society study.[2]
- The 90-city National Morbidity and Mortality Air Pollution Study associated daily exposures of particles with premature death.[3]

Heart Disease

The largest fraction of particulate matter-related premature deaths in the U.S. are believed to be from heart disease. Doctors have long known the relationship of inflammation and heart disease and particles may have a fatal inflammatory effect on the heart. Other factors include atherosclerosis (hardening of the arteries) and cardiac arrhythmias that may be precursors to sudden death or stroke. Research also suggests that particles have the ability to directly alter heart rate function and cause myocardio infarction or "MI"-- a potentially fatal blockage of blood supply to the heart.

- A 2007 Harvard study of 54,000 workers in the trucking industry found a higher risk in heart disease in the trucking industry compared to the general U.S. population: a 49 % higher risk in drivers, a 32% higher risk in dock workers, and a 34% higher risk in shop workers.[4]
- A 2004 study of highway patrolmen exposed over a shift, particulate matter was linked to irregular heartbeats and increases in blood inflammatory markers.[5]
- A 2004 study found that heavy equipment operators exposed to diesel exhaust have a 47 percent increased risk of death due to ischemic heart disease (congestive heart failure/heart attacks).[6]
- Researchers documented a 24% increase in risk of women having a cardiovascular event and an overall 76% increase in risk of death from cardiovascular disease for each 10 ug/m3 of PM2.5 in the ambient air. Within-city risks were higher than the risk between cities suggesting the importance of local sources of particles, such as diesel vehicles.[7]

- Ultrafine particles in fresh diesel exhaust (tiny particles under 0.1 micros in size), can lead to systemic acute inflammation and exacerbation of cardiovascular disease and atherosclerosis according to recent studies.[8,9]
- A 2007 study of 700 heart attack survivors shows that they were most likely to have been in heavy traffic the hour before they suffered the heart attack, whether in cars, streetcars or buses.[10] Studies find that traffic-related health risks are better correlated to truck rather than car volume and therefore may be more strongly related to diesel engine exhaust.
- A link between exposure to particles and vascular inflammation/atherosclerosis is suggested by animal studies and could explain how particles are linked to heart attacks.[11]

Cancer

Researchers repeatedly find associations between exposure to diesel exhaust and cancers. Approximately three-dozen occupational studies conducted over the past three decades link diesel exhaust exposure to lung cancer, posing an increased cancer mortality risk of 10-40%. In the laboratory, scientists have observed DNA damage and cell mutations that could be an indicator of the ability of particles to trigger cancer.

Based on EPA's 2005 National Air Toxic Assessment released in 2011, CATF estimates that the lung cancer risk from particles is approximately three times the combined risk of the 80 air toxics modeled by EPA.

- Over 30 epidemiological studies link diesel particulate matter to lung cancers.[12,13,14,15,16,17,18]
- Risk of lung cancer death was linked to fine particles in a study that tracked a million people over a decade and a half in 150 U.S. metropolitan areas[19]
- Diesel soot is identified as a carcinogen U.S. EPA, the State of California and the International Agency for Research on Cancer (IARC).[20,21,22] Other compounds in diesel exhaust, other than soot are also known carcinogens such as polycyclic aromatic hydrocarbons, and formaldehyde.
- Operators of heavy machines in ground and road construction exposed to diesel exhaust are at risk of death from cancers of the digestive system, intestines, lung, liver, bladder and stomach.[23]
- CATF estimates that, based on EPA's 2005 NATA data released in 2011, the lung cancer risk from exposure to diesel particles is 159 times greater than the EPA's "acceptable" risk of 1 cancer in a million.
- In a study of 55,000 railroad workers over 38 years, Harvard researchers found an overall 40% increased risk of lung cancer for workers in 30 job categories.[24,25]
- The NIOSH Teamsters (truckers) study concluded that the lifetime excess risk for truckers was 10 times higher than the 1/1000 excess risk allowed by OSHA in occupational settings.[26]

- A 2007 Harvard study of 54,000 truckers from 1985-2000 found a 10 % higher risk for lung cancer in drivers and dock workers compared to the general U.S. population.
- Recent studies link particulate matter exposure to DNA damage. [27]

Respiratory Health Impacts

Researchers have long associated diesel exhaust, particulate matter and traffic with reduced lung function and lung growth, asthma attacks, asthma sensitization, and in one study, emphysema.

- Multiple studies link asthma and allergic sensitization and particles.[28, 29,30,31,32,33] An East Bronx NY study suggests children exposed to higher levels of heavy-duty diesel exhaust have higher incidences of asthma.[34]
- A 2009 field study found that short-term exposure of asthmatics to urban roadside diesel traffic led to consistent and significant reductions in lung function, airway acidification and inflammation. A study from the Netherlands links asthma diagnosed before 1 year of age to traffic.[35] In a California study, asthma and bronchitis was found to be 7 percent higher among children attending school in high-traffic areas, compared with schools along quieter streets.[36]
- Heavy equipment operators exposed to diesel exhaust have a significantly elevated risk of death from emphysema.[37]
- Deficits in lung function growth were found in southern California 18 year olds exposed to PM2.5 and black carbon. [38] The number of children with lung function deficits was 5 times greater in communities with the highest levels of PM2.5 compared to communities with the lowest levels of PM2.5.

Exposure to diesel exhaust, and proximity to traffic poses a risk of other serious disease including stroke, diabetes, slowed fetal growth, infant mortality and possibly autism.

- Diabetes: A 2010 study links particulate matter air pollution to diabetes in the U.S. (http://care.diabetesjournals.org/content/33/10/2196). The study found that counties with higher levels of particulate matter had increased prevalence of diabetes, even where counties were in attainment with the EPA's National Ambient Air Quality Standard for fine particles ($PM_{2.5}$). Elevated circulatory and cardiovascular disease risk was found in another study based on 24-hour exposures to particles.[39]
- Nervous system impairment. A study of railroad workers exposed to diesel exhaust concluded: "crews may be unable to operate trains safely." [40]
- Stroke. Diesel exhaust particles may raise the risk of blood clots and stroke.[41] Risk more than doubled within 2 hours of exposure to high levels of fine particles in a Japanese study.[42] Formation of blood clots (thromboses), have been documented in laboratory animals exposed to diesel particles.[43]
- Autism A 2010 study correlates prenatal freeway traffic proximity in California and incidence of autism. The risk of autism is nearly double (86% increase)

inside 1,000 feet. Diesel exhaust could be a risk factor.[44]

- Slowed fetal growth as a result of maternal exposure during pregnancy[45] and infant mortality.[46, 47]

2. Diesel Emissions Reduction Act (DERA)

While the U.S. EPA has mandated tighter emissions rules on new diesel engines, emissions from most of the current fleet of 11 million heavy-duty diesel engines remain uncontrolled. CATF's diesel advocacy focuses on cleaning up this existing fleet of diesel engines, which are expected to remain in operation for decades to come. As the Diesel Technology Forum has noted, the rate of turnover of the fleet to new, cleaner engines has been slowed by the recession as sales of new diesels have plummeted. As a result, older, dirtier diesels will be with us for even longer than expected. More years and more miles by older, dirtier trucks will mean more pollution, so we need tools to deal with pollution from the existing fleet.

In 2005, Congress and the Administration sought to provide states and localities with new tools for meeting National Ambient Air Quality Standards (NAAQS) and reducing human exposure to harmful diesel emissions. Passed with overwhelming support from government, industry and environmental organizations as part of the Energy Policy Act of 2005, the Diesel Emissions Reduction Act (DERA) established a federally sponsored voluntary retrofit initiative to reduce emissions generated by America's aging diesel fleet. Under the Clean Air Act, states must develop State Implementation Plans (SIPs) to address fine particulate and ozone emission reductions to meet the new air quality standards. DERA offered states and communities a tool and resources to enhance their own air quality programs.

The original program was authorized for $200 million/year for 5 years or $1 billion. Since that time, $469.2 million has been appropriated to EPA's Diesel Emissions Reduction Program (DERP), $169.2million in annual appropriations and $300 million through the American Recovery and Reinvestment Act. For FY2011, $50 million has been appropriated for DERA, however, the President's FY2012 budget has proposed to zero out the program. That would be a mistake.

Since its enactment, the Diesel Emissions Reduction Act (DERA) has been successful in addressing this problem from an economic, environmental and public health perspective. The DERA program has been responsible for the creation and retention of local U.S. jobs that involve manufacturing, installation and servicing of emissions related technologies. In its statutorily mandated report to Congress on the performance of the FY2008 program, EPA estimated that for every dollar spent on the DERA program, an average of more than $13 in health benefits are generated. The program is oversubscribed; EPA receives $5 in applications for every $1 appropriated for awards. EPA found that for that one fiscal year DERA had funded 119 projects affecting more than 14,000 diesel-

powered vehicles/equipment across the country. It created new state clean diesel grant programs in all 50 states and attracted $61.4 million in matching funds. That first-year investment resulted in the elimination of 46,000 tons of NOx and 2,200 tons of PM emissions. EPA estimated that this resulted in $580 million to $1.4 billion in public health benefits. In addition, fuel saving measures resulted in 464,400 tons of CO2 emission reductions, which meant 3.2 million gallons of fuel saved per year for a cost savings of more than $8 million per year. The federal investment in DERA that year generated more than $61M in matching or leveraged funds. In total, in FY 2008, investment in DERA created or sustained approximately 2,150 jobs.

As part of the American Recovery and Reinvestment Act (ARRA), DERA was funded at the $300 million level. EPA received more than 600 applications amounting to $2 billion in project proposal requests were received in 2008 and more than $2 billion in matching funds offered. Nearly 400 applications were received in 2009 for the $84 million available in FY2009 and FY2010 (not including $36 million for state programs). Approximately $570 million in funding was requested and more than $1 billion in matching funds offered. EPA estimates that more than $1 billion in qualified, unfunded project proposals were received.

To date, the federal appropriations for DERA ($469.2M) has created or sustained nearly 9,000 jobs since 2008.

Throughout the program's history, DERA has enjoyed strong bipartisan support most recently demonstrated in December 2010 when Congress took the extraordinary step of reauthorizing DERA during the "lame duck" session. Additionally, a broad coalition of more than 530 industry, labor, environmental, public health and state and local government groups sent a letter to Congress in November 2010 supporting the reauthorization of the program. A similarly broadly signed letter was sent to Appropriators on March 28, 2011 in support of FY2012 funding.

DERA is now authorized from FY2012 through FY2016 at $100M per year. It authorizes the use of grant, rebates and loans to achieve significant reductions in diesel emissions and improves upon the original authorization by focusing the program on the most beneficial solutions and streamlining implementation. The program now also makes it easier for EPA to leverage DERA funds through loans and by soliciting larger project proposals. DERA provides that 70 percent of funds are distributed by EPA (with 5% for emerging technologies); allocates 30 percent of funds to states and but will now require that only EPA or CARB verified and certified technologies be funded. DERA includes an incentive for states to partially match federal funding to increase overall size of funds and now requires that EPA give the highest priority to projects that meet the Congressional established criteria for ranking and evaluating projects, which emphasize cost-effectiveness and health benefits.

The continued need for DERA has recently been acknowledged by the Obama Administration. In her May 9, 2011 letter to Senator Carper, EPA's Assistant Administrator for Air and Radiation, Regina McCarthy, admitted that continuing DERA would provide a cost-effective way to address the existing fleet and deliver immediate public health benefits. EPA Administrator Jackson recently testified similarly in answer to questions before the full EPW committee.

DERA is backed by a uniquely broad coalition of environmental, science-based, public health, industry, labor and state and local government groups. States and localities and environmental, health, user and industry groups all support funding for diesel retrofits and clean air agencies because it is sound environmental, health and budgetary policy. It is our hope that Congress will continue to provide leadership on this issue and we urge you to allocate $50 million for DERA in Fiscal Year (FY) 2012 (equal to FY 2008 levels).

The DERA Coalition has also requested that Congress support the President's budget request of $305.5 million for state and local air quality grants in FY 2012. This level of funding is critical because state and local air quality agencies are under-funded and face increasing responsibilities – such as attaining and maintaining National Ambient Air Quality Standards, implementing clean air rules, and addressing toxic air pollutants.

3. Clean Construction in the Transportation Bill

One sector that has been underserved by DERA and other existing programs (like the Congestion Mitigation Air Quality program under the current Transportation Bill) is the construction sector. Construction contractors are not always well positioned to take advantage of these programs, which have required a competitive grant application process. There is a better way: Clean Construction.

What is Clean Construction?

Taking the lead from several states and municipalities around the country that have adopted Clean Construction specifications and working with the contractors and the environmental community, Senator Carper has crafted the Clean Construction Act of 2011, which will reduce the amount of harmful particulate matter emissions emitted by older diesel on- and off-road construction vehicles working on federally-funded transportation infrastructure projects located in areas with poor air quality. This will be accomplished by ensuring that diesel construction equipment employs modern engine and pollution reduction technology through a requirement and funding. As a policy roadmap, the Clean Air Task Force (CATF) and the Associated General Contractors (AGC) negotiated a set of Clean Construction Principles that are embodied in the Clean

Construction Act of 2011. Both our organizations endorse the Clean Construction Act and we congratulate Senator Carper on the introduction of the bill today.

The bill spells out a process for cleaning up construction equipment and vehicles used on a federally funded transportation infrastructure projects located in PM2.5 designated non-attainment and maintenance areas. These engines can be retrofitted cost effectively with best available emission control technologies that can reduce harmful emissions of PM2.5 by up to 85 percent.

The funding to purchase and install the emission control technology would come directly from the project costs as an eligible project expense through the change order process. The cost of the diesel emissions control technologies is capped at no more than one percent of project cost.

Why We Need Clean Construction

The Clean Air Act Advisory Committee (CAAAC) estimates that over 37 percent of land-based particulate matter comes from construction equipment.[48] Nationwide, there are over 2 million pieces of construction equipment and most lack modern particulate pollution controls. Pollution from diesel equipment has the potential to affect citizens in all parts of the country. Over 88 million Americans live in counties that violate federal health standards for particulate pollution.

The equipment that would utilize emission control technology are strong, well-built machines that last upwards of thirty years. While recognizing the important function and the positive work these vehicles provide to owners and communities alike, technology is available to make these vehicles cleaner and the communities in which they operate healthier.

Technology is Available

Fortunately, affordable emission control technology is available to address emissions from construction equipment. This technology is feasible to install and installation is accessible throughout the country. The U.S. EPA estimates that retrofitting 10,000 engines would eliminate roughly 15,000 tons of harmful pollution each year. Achieving emissions reductions from in-use diesels is needed because older engines pollute at much higher rates than newer ones and remain on the road for decades. The U.S. EPA believes that in-use diesel emission control programs can help states meet their immediate nonattainment goals and other Clean Air Act requirements such as conformity, as well as address ongoing public complaints and concerns about dirty diesels.

There are currently several available emission control technologies that address the emission challenges facing on- and off- road construction equipment. These technologies include: retrofitting with Diesel Particulate Filters (DPF), repowering

and/or rebuilding older engines, and the use of idle reduction technologies, all of which must be verified by EPA or the California Air Resources Board to ensure their effectiveness. Especially in combination, these technologies can reduce fine particulate matter emissions from construction equipment by 85 percent or more.

The tons of PM2.5 reduced by the Clean Construction Act of 2011 will be available to states to help write the State Implementation Plans (SIPs) to meet National Ambient Air Quality Standards (NAAQS), as credits for transportation conformity, and/or as credits for project conformity at the discretion of the states.

State and Local Clean Construction Initiatives

Modern pollution control equipment is being used across the country to build clean transportation projects to ensure that no harm is done to the air quality in communities during infrastructure projects. Clean Construction was employed on the Big Dig project in Boston as far back as the 1990's, but most notably was used in the reconstruction of lower Manhattan after the 9/11 attacks.

After the success of the lower Manhattan project, the rest of the boroughs of New York wanted Clean Construction and the New York City Council passed Local Law 77, which requires it on all projects in the City. Soon thereafter, the New York Legislature passed the New York Diesel Emissions Reduction Act (NY DERA), which required clean diesel on all state owned fleets and on projects performed by private contractors working for the state.

Meanwhile, in Illinois, Cook County, the county comprising the City of Chicago, adopted an ordinance requiring Clean Construction. The Governor of Illinois followed suit with an Executive Order requiring Clean Construction on all state-funded projects in nonattainment areas. And, as one of his last acts in office, Chicago Mayor Daley introduced and the Chicago City Council unanimously passed a Clean Construction ordinance for the City.

Last year, Rhode Island, following action by the City of Providence, passed legislation with the support of the contractors requiring Clean Construction. And just last month, Governor Christie of New Jersey issued an Executive Order requiring Clean Construction. The City Council of Pittsburgh is holding a hearing next month to consider a Clean Construction ordinance.

History of Diesel Retrofits in the Transportation Reauthorization Bill

During the Reauthorization of SAFETEA-LU, a significant effort was made to include Diesel Retrofits as a priority in the Congestion Mitigation Air Quality (CMAQ) program. Securing the CMAQ priority language was successful, but the implementation of this policy was less so.

Without clear guidance, states were reluctant to utilize the diesel retrofit language. Contractors who were in most need of the funding for retrofits found the process of going through CMAQ cumbersome. In short, the CMAQ priority language did not accomplish what it had set out to do: provide a resource for contractors and states to utilize emission control technology in the areas with the most impacted air quality.

A New Approach

As a new approach, we recommend that Congress adopt the approach embodied in the Clean Construction Act of 2011 as part of the Transportation Bill re-authorization. The bill requires that federally funded transportation projects in non-attainment areas phase in the use of clean construction equipment – such as front-end loaders, diggers, and earthmovers. The bill provides funding to retrofit, repower and upgrade equipment to provide the maximum achievable reduction of diesel particulate emissions as an eligible project expense.

The bill would achieve this through a funded requirement for emission control technology in PM2.5 designated non-attainment and maintenance areas an eligible project expense through a change order, a process that both State DOT's and contractors are familiar with and utilize. The goal is to streamline a process that integrates clean air benefits into project delivery.

Also important with respect to the competitive bid process is that contract awards should be blind to whether a firm already has clean construction equipment in its fleet. This will ensure that smaller firms that have not invested in retrofits are not shut out of the bidding for projects, thereby making sure that some of the dirtiest equipment in service is eligible for clean up.

To maintain strict cost controls, the bill requires that no more than one percent of a transportation project's cost must be used by States to upgrade dirty equipment. We have commissioned case studies on ten projects, five that have been completed utilizing Clean Construction and five that have projected the use of Clean Construction on projects. The results have consistently shown that project equipment can be cleaned up for no more than one to one and one-half percent of project cost. This provision is expected to allocate approximately $200 million per year for clean equipment. CATF estimates that the bill will eliminate 9,000 tons of PM2.5 emissions and avoid nearly 1,000 premature deaths plus many more adverse health effects.

Thank you for the opportunity to testify in support of clean diesel in two important federal statutes. I look forward to working with the subcommittee in securing funding for DERA and including Clean Construction in our nation's next Surface Transportation Reauthorization Bill.

[1] Clean Air Task Force, "Diesel and Health in America: The Lingering Threat" (February 2005); see also, Abt Associates, Power Plant Emissions: Particulate Matter-Related Health Damages and the Benefits of Alternative Emission Reduction Scenarios (June 2004)

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Senator CARPER. All right, Mr. Schneider, thank you very much for your testimony, for your enthusiasm, and for your encouragement.

I have a question I would like to lead off with, but before I do that, let me ask unanimous consent to enter into the record a handful of items here. Let me just read through these quickly, but I ask unanimous that the following items be submitted for the record: first, a joint letter from the Associated General Contractors of America and the Clean Air Task Force in support of the Clean Construction Act of 2011; and second, a statement by Mr. Timothy Reagan, senior vice president of Corning, Incorporated, regarding cost-effective ways to reduce diesel emissions; third, a statement from Mrs. Suzanne Malec-McKenna, commissioner of the Department of the Environment for the city of Chicago regarding similar clean diesel construction efforts going in her city as the ones proposed in the Clean Construction Act of 2011; fourth, responses from the Environmental Protection Agency that we had sent them on DERA; and finally, a statement from Mr. Larry Schafer, senior advisor to the National Biodiesel Board regarding the advancement of biodiesel.

Without objection, these will be admitted into the record.

Do I hear objection?

Senator BARRASSO. No objection.

Senator CARPER. Pretty quiet. OK, good. Hearing none, so ordered. Thank you.

[The referenced documents follow on pages 78–95.]

Senator CARPER. OK, first question if I could, a question to Mr. O'Keefe and I might follow it up with asking Mr. Schaeffer, maybe Mr. Parfitt as well, but the initial question to you, Mr. O'Keefe.

Could you just take a minute or two and discuss why small particulate pollution is harmful to our health? Could small diesel exhaust particles be especially dangerous to public health because they are encased with toxins?

Mr. O'KEEFE. I would be glad to. The particulate component of diesel exhaust is $PM_{2.5}$ and it is a pollutant of special concern.

Senator CARPER. Why don't you tell us, why do they call it $PM_{2.5}$?

Mr. O'KEEFE. $PM_{2.5}$, thank you, goes to the size of the particle. The range of particles generally regulated goes from ultra-fine particles, which diesel is also a significant source of, through $PM_{2.5}$ which diesels also put out, up to what is known as the coarse fraction, the difference between $PM_{2.5}$ and PM_{10} which are larger granular parts of the particulate. They tend to have somewhat different health effects, although it is at this point somewhat hard to distinguish, particularly between ultra-fine and $PM_{2.5}$. They are generally all known as fine particles.

The simple statement is that fine particles are often made of carbon and other toxins. They are small enough that they can be absorbed relatively deeply into the lung and can be absorbed into the system and have been associated with a range of cardiovascular and respiratory effects. These are documented both in studies of short-term effects of particles where when air pollution goes up or down on a particular day, one can observe a corresponding increase or decrease in mortality. There is a key HEI study called the National Mortality, Morbidity and Air Pollution Study, or NMMAPS,

of the 90 largest U.S. cities that documented these effects from daily exposure to particles.

But also longer-term studies, chronic studies, as evidenced by the American Cancer Society Pope study, which was a study originally of over some 400,000 Americans and exposure to long-term effects of particles. This is really the seminal study for regulation that looks at particulates, as I said, of which diesel is a major source. It found that there are significant cardiovascular and respiratory effects associated with particles, including ischemic heart disease, which can reduce blood flow to the heart and potentially cause heart attack.

Senator CARPER. All right, thank you.

Let me just followup on that, if I could, with Mr. Schneider and Mr. Parfitt, OK? The followup, could you also take maybe a minute apiece and discuss for us how dirty diesel engines contribute to nonattainment areas for particulate matter and ozone?

Second, how are the emissions from old diesel engines contributing to nonattainment areas, compared to newer vehicles, powerplants and other sources?

Do you want to go first, Mr. Schneider?

Mr. SCHNEIDER. I would be happy to address that, if I can go first, thanks.

First of all, there are many, many different sources of particulate matter. You mentioned a few right there. As powerplants are getting cleaner as a result of some of the EPA regulations that are coming out, diesels are becoming the largest fraction of the remaining particulate matter. Powerplant pollution has been cleaned up as a result of EPA regulations in the east that have to do with health-based standards and visibility regulations in the west, to the point where they are about half of what they were just 10 years ago. We have documented what the health benefits have been from that.

So it is a success story, and through the Clean Air Transport Rule, there are going to be even more reductions.

When we did our study that pegged diesel deaths at about 21,000, at the time we did it powerplants were responsible for about 24,000 deaths. Now, powerplants deaths are about down to 13,000 deaths and they are going down from there. Over time, as you have heard, diesel deaths will go down, too, as the new engines come into the system, but it is going to take 30, 40 years for that to play through, as opposed to the regulations on powerplants.

So if you are a State and you are trying to meet your Clean Air Act requirements, attainment goals, those are happening right now. Those requirements are in the very near future, not 20 or 30 years out. So there need to be strategies that address diesel particulate pollution to help State regulators who are in nonattainment areas deal with those.

Whether it is DERA or whether it is the Clean Construction Act and so forth, you have to deal with each particular sector as appropriate for that particular sector and push those emissions down to help regulators meet their targets.

So that is the basic thing, and just the math is such that diesel is going to be the biggest quotient that portion is going to have to be addressed.

With respect to the difference between the old and new vehicles, Mr. Schaeffer has a great graph on that as a part of his presentation materials there. The difference between an uncontrolled diesel engine and one that is fitted with a particulate filter is really, they are certified at 85 percent cleaner for particulate. But our in-use testing has shown probably close to 90 percent, 95 percent cleaner as a result of that.

The statement that Mr. Schaeffer made earlier about how the air going in sometimes is cleaner coming than it was going in, we have actually demonstrated that in the field. These particular filters are actually air filters. If you are in a polluted area, polluted air goes into the engine and comes out cleaner than it was when it went in, which is pretty amazing.

Senator CARPER. When he made that statement, I leaned over to Senator Barrasso. I said, you know, if we could get enough of those out there and operating, we could have a lot of clean air.

[Laughter.]

Senator CARPER. There is a point of diminishing returns, I suppose.

Mr. SCHNEIDER. Yes.

Senator CARPER. Mr. Parfitt, do you want to take a shot at that one, please?

Mr. PARFITT. Yes, thank you, Mr. Chairman.

With respect to how the replacement and retrofit of engines in ozone nonattainment areas is beneficial, the emissions from these construction vehicles, heavy equipment, out in the nonattainment areas, I am particularly referring to southwest Wyoming, related to ozone formation, these pieces of equipment emit nitrogen oxides and volatile organic compounds, which are precursors to the development of ozone.

The work that we have done with the retrofit of heavy construction equipment in this area has been an important part of getting a handle on the reduction of ozone formation amongst other things and other programs that we have in place right now to address ozone formation. DERA is a key program to addressing that. We were able to retrofit 36 engines in that area and achieve significant reductions. The point I would like to make is that there are several other pieces of equipment that could be retrofitted to further reduce those conditions that lead to the constituents that are precursors to ozone.

As far as the old versus the new vehicles, as we have demonstrated, there are significant reductions in particulate matter, reductions of the 2.5 particulate matter of 90 percent in some instances. It really depends on the type of engine that you are replacing, but you do realize significant reductions in both nitrogen oxides and particulate matter.

Senator CARPER. All right. Thanks so much.

Senator Barrasso.

Senator BARRASSO. Thank you, Mr. Chairman.

Mr. Schaeffer, in reading your testimony, you make reference to the Wyoming Department of Environmental Quality. I know they used $1.1 million of DERA funding and did a $2.3 million project in Pinedale, WY. The program provided engine upgrades in construction equipment serving the natural gas fields in Pinedale. As

you know, Pinedale has had some air quality issues that the State and the community and employers are all trying to address.

I understand that the project resulted in really significant reductions in diesel emissions, a reduction of 423 tons of NOx and 48 tons of particulate matter, and 47 tons of hydrocarbons, and 226 tons of carbon monoxide. So I don't know if you or maybe Mr. Parfitt would care to elaborate in more detail on the success of that effort in providing the cleaner air in Pinedale?

Mr. SCHAEFFER. If I could, and thank you for the question, Senator Barrasso. Just a comment about some aspects of that project, and then a broader statement about the solutions that are available.

We think of retrofit in a very broad sense. There are many ways to get lower emissions our existing engines and equipment. The situation that you are citing specifically in Wyoming involved a range of things, including engine re-powers. This is an example of preserving the value in machines where we take an engine out and put a newer model in that is going from a tier zero or perhaps an unregulated machine in some of the very, very large equipment, to a tier two or even a tier three level technology. Depending on the circumstances, they are different in every machine. That yields a tremendous benefit, as you have outlined, for emissions reduction.

The other incredible value there, though, is to the operator, because you now you have provided the operator substantial value extending the life of his equipment, and he is probably getting a much better performance out of the equipment and lower fuel consumption. So he is feeling the economic benefits. The environment is feeling the clean air benefits.

Senator BARRASSO. Mr. Parfitt, I don't know if you want to add any more?

Mr. PARFITT. Yes, thank you, Senator.

In addition, I would like to add that one of the successes of this program, outside of the actual reductions in emissions, was the voluntary effort coming forward by the operators. Not only did DERA contribute funds to these retrofits and upgrades, but also industry made significant contributions through not only direct contributions from those operators, but also through the Jonah Infill office, which is associated with that particular development, to the tune of about 46 percent of the total cost of the project.

Senator BARRASSO. You used the words, the voluntary effort, in terms of financing. Also I think in your written testimony you had said that voluntary programs like DERA are far less costly for the State, for you as deputy director of the Department of Environmental Quality, less costly for the State to implement than traditional regulatory programs or standards coming out of Washington. Can you comment on that a little bit?

Mr. PARFITT. Yes, and I guess I would make two points.

The first is this is something that has been recognized by the States and currently we are engaged in discussions with EPA through ECOS, the Environmental Council of States, to look at the cost of rules that get passed down to States, and how we can take a closer look at that to reduce the impacts to the States when it comes to implementation of these programs as they are passed down.

As we have new regulations that get passed down to the States, we have to look at what the costs are, and those costs are in staffing for compliance and inspections; for developing new rules; conducting hearings and so forth. So when we have voluntary programs like this, we don't have those associated costs that normally come with some of these new regulations.

Senator BARRASSO. That kind of leads to my next question, because you talked about in your testimony that oftentimes the new environmental regulations fail to really adequately recognize the impacts created for industry and for our State agencies that are ultimately charged with implementing these things.

So I know you just gave us a couple of examples. Any others that you could think of?

Mr. PARFITT. Well, there is one example where the rule is under consideration right now for a sulphur dioxide 1-hour standard. Where the proposal is right now is that nonattainment zones with the 1-hour standard would be established through modeling. This is a deviation from the typical practice of establishing nonattainment zones through actual monitoring.

Our concern with that would be that you can designate an area in nonattainment through modeling efforts, but you would have to establish monitoring to remove the nonattainment status. What that means is that the States would be left with the task of setting up monitoring stations, which are very expensive, to make those determinations.

Senator BARRASSO. You also mentioned the EPA is soon to be issuing new ozone standards, which you said may put many areas of the west in nonattainment. I am the Chairman of the Republican Western Caucus, so those are obviously issues that we have concern about.

So could you explain for the committee what the standard's impact on Wyoming communities and Wyoming's Department of Environmental Quality are going to be?

Mr. PARFITT. Sure. Right now, we have one area in southwestern Wyoming where we have had some nonattainment issues with ozone. If the standard is lowered, there would be more areas of the State, moving over in to the eastern parts of Wyoming, that would fall into nonattainment depending on where the new standard comes out.

One of the things that needs to be recognized in the western States is that we are dealing with wintertime ozone. This is a little bit different than what we are traditionally concerned about with ozone, which is summertime in urbanized areas. So in recent years, we have been doing a lot of research to understand why ozone forms in the wintertime in the areas of Wyoming where it does. There are many, many variables involved.

Senator BARRASSO. OK.

Mr. Schaeffer, if I could, in the testimony earlier, you, and I think all of the witnesses, said that DERA is a program that works, and it is a program that has been a success. The Chairman and I have stated the program is a success. It has bipartisan support. It was begun in a bipartisan way. But the President has zeroed out funding for the program in Fiscal Year 2012.

I don't know if you can explain the phenomenon of what has happened here, why this has happened, or if you or anyone on the panel can explain this, why we are in this situation?

Mr. SCHAEFFER. Thank you for the question, Senator, and that is a difficult question, not knowing the priorities in decisions that were made within the Administration, both at EPA and within the Office of Management and Budget.

I think, based on our assessment of that, that there is really some faulty interpretation. As I pointed out in my statement, the continuing need is pretty well justified and fairly well documented in terms of the number disparity of what DERA was able to accomplish in its first period, the first 5 years, with regards to what is remaining out there.

We have 11 million pieces of equipment. I would say that not all of those would be eligible for retrofit because they may be too old or used in a way that would not provide the right technology fit, but it is a big number. We are not sure about why that might be. I think at this point, it is really an issue of how do we move forward and how do we restore not only the goodwill we have with DERA, working with such a broad-based coalition, and the Administration, which has been a valued partner here.

I think this is a decision that was looked at only on a dollars basis and not on a practical and what-makes-sense basis.

Senator BARRASSO. Thank you.

Thank you, Mr. Chairman.

Senator CARPER. Let me just followup and question back and forth with Senator Barrasso and Mr. Parfitt.

I asked my staff, other than particulate matter, are there other pollutants that have national air quality standards, in offering our 2011 construction equipment legislation we are unveiling here today? The point is that in order to require that up to 1 percent of transportation funds in an area be used for air pollution, that requirement cannot be triggered by nonattainment in ozone; could not be triggered by nonattainment in carbon monoxide or nitrogen oxide or sulphur dioxide or lead; only on particulate matter. Is that correct? That is my understanding.

I see people nodding their heads. Yes?

Mr. LANHAM. As I read, yes, sir, I agree with that.

Senator CARPER. Yes, that is the intent. The amount of money that could be spent would be a maximum of 1 percent of transportation funding, only if it is triggered by nonattainment for particulate matter, for $PM_{2.5}$.

So if areas are in noncompliance for ozone or carbon monoxide or nitrogen oxide or SOx or sulphur dioxide or lead, that doesn't trigger the 1 percent requirement. So I just want to be clear on that. If the cost for attainment is less than 1 percent, say half of a percent or something, that is how much could be spent.

Let me just ask a question. For those who might not be enamored with the clean construction legislation that we are introducing today, would you just share with us what some of their concerns might be? Then for the panel, if you feel comfortable, how would you address or rebut those concerns?

Anybody at all? There may not be any concerns that you are aware of, so it would be a pretty short answer. Anybody?

Mr. SCHAEFFER. Mr. Chairman, we have not seen your legislation. It has been introduced today, from what we have heard. As we have heard our colleagues testify to here, it sounds like a very positive effort and program that would expand the benefits of clean diesel technology in the construction sector. We would be happy to take a look at it and provide some comments to you and your staff.

Senator CARPER. All right. Thanks.

Anybody? Mr. Lanham?

Mr. LANHAM. Senator, yes sir. Having been involved with similar discussion of this in State and local levels and very similar, it is easy for us in the policy discussions, and technology is extremely sophisticated, and where we find often difficulties in implementation. I think we have one mind and philosophy on this is the details and getting into the technology, is unilateral application.

We have found, and I think Allen alluded to it, that there are some applications that don't fit. As we implement, we need to recognize those things and tailor them because we want to see this thing succeed. We don't want to see a lot of horror stories come back about what didn't work. We want to hear about what did work.

I think if we put our heads together, we can meet some of these logistical concerns. We have done 175 re-powers as a company and it took us 2½ years to accomplish that. With our equipment support staff and the manufacturers out there that were supporting us, it took two and a half years just to get that.

So the infrastructure that exists to support this effort has some constraints that give us pause as we full-scale implement this. How ready are they to support? There is a ramp-up concern. There will be some logistics issues that we will have to address as we move forward.

Senator CARPER. All right. Great. Thank you.

I have a question here for Mr. Schaeffer, if I could. In your statement, I believe you claim "Clean diesel technology is making a bigger contribution toward reducing oil consumption and greenhouse gases, more than any other affordable drive technology today." That is quite a statement.

Could you just elaborate on that, please?

Mr. SCHAEFFER. I can. As I mentioned at the outset, that is not the subject of the hearing today, but the reference is to the new generation of clean diesel cars, which are on average 30 percent more energy efficient than their gasoline counterparts. To make a long story short, the clean diesel car technology is able to achieve that 30 percent benefit no matter where you are driving, whether you are on I–95 from here to Wilmington or whether you are in Wilmington and stuck in traffic behind that bus, like you were. So it is getting that full range of benefit of technology and fuel economy, no matter where it is operating.

Contrast that with hybrid technology that may only get very high fuel economy if you are in a lot of urban operation, or contrast that with a plug-in hybrid electric which has a very limited range, which works well if you are within the range of the charging area, but not well if you are driving between Wilmington and Wyoming.

Senator CARPER. OK. Do you know how far it is from Wilmington to Wyoming?

Mr. SCHAEFFER. I should know, but I don't, unfortunately.

[Laughter.]

Senator CARPER. I have fun with my colleagues Senator Barrasso and Senator Enzi, who are from the State of Wyoming, but there is a town called Wyoming, DE. Not infrequently, I will say to them, like, I was just in Wyoming this past weekend, and I will say to them, I was just in Wyoming yesterday or the day before yesterday. You were? What were you doing in Wyoming? I said, well, I was just coming out of Dover and it was like right there to go through.

But anyway, Wyoming is a great place, and a great place, actually, for Little League baseball, if you can believe that.

I want to ask a followup question if I can, maybe one for Mr. Schneider and then one for Mr. Lanham, if I could.

But for Conrad Schneider, given the limited resources, do you believe that the DERA program has been able to adequately address dirty diesel emissions from construction equipment on transportation projects? I think I know the answer, but let me just ask it anyway.

Mr. SCHNEIDER. Thank you for the question, Senator. When we began the process of discussing what resulted in the principles that we ended up agreeing with AGC on to sort of form the basis of this idea, one of the first things that their representatives told us that they had really tried very, very diligently to access the DERA money, and also under SAFETEA-LU, some of the congestion mitigation air quality money.

Though I think as a result of the joint efforts of pretty much people sitting here at the table and others, they have been more successful more recently. There haven't been enough resources, and that process is pretty difficult because it has involved, in both cases, a competitive grant application process. A lot of contractors, I think Mr. Lanham's company is big enough to be able to have the capacity to be able to do some of that, but some of the smaller outfits don't have. They don't have grant-writers on staff, let's put it that way. They are busy building our infrastructure.

I think together, we thought there was a better way, a more efficient way to streamline this type of thing into project delivery though the principles that we negotiated.

So our basic answer is DERA is a great program. It needs to be restored, I think was the word that was used here, and funded. But with respect to this particular sector that has been historically underserved, we feel this is an additional tool would be very helpful.

Senator CARPER. All right.

Mr. Lanham, did you want to comment on that as well?

Mr. LANHAM. Yes, sir, Senator. I agree with what Conrad said. I think our industry has been underserved. Typically, in a competitive grant situation, the way they calculate dollars per emissions reduced and trying to find an equitable way to compete for grant funds, the non-road sector generally does not compete well against on-road applications. The bang for the buck is better in an on-road application. We find ourselves generally on a competitive grant basis on the outside looking in.

Texas does have its own kind of local version of DERA that we have been able to avail. It has been around for about 10 years, and that is how we have been able to have such a track record as a

firm, using our local program to assist. But we have suffered exactly that same dilemma at the State level, that the non-road application finds a great difficulty competing against on-road. The cost per ton of emissions reduced, if that is the benchmark, then competitive grants tend to favor on-road applications, and we lose out.

Senator CARPER. All right. I think you sort of answered the question I was going to ask you there.

Let me just throw this one out there for you. One of the attractions for Diesel Emission Reduction Act has been the report I believe by EPA that for every dollar that we spend to reduce diesel emissions, we recognize a benefit, a combined health and economic benefit of $13. As I said earlier, in this business, that is a pretty good return. I think in any business.

I don't know and I should probably ask Paul Schmidt and Laura Haynes about this, and I will later, but have we asked EPA or anyone else yet to figure out if the cost-benefit ratio on our clean construction legislation that we are introducing, what might that be? What might that be? Let me just say, would you expect it to be roughly the same? Would you expect it to be slightly more, slightly less? Please, anyone.

Mr. SCHNEIDER. I don't believe anyone has asked EPA to do that calculation yet. We have done a very rough calculation which I would say is not definitive. We have been trying to look at this and I think we would welcome having EPA's input to that.

But we would expect it to be probably the same or a little lower than that, but still very, very well cost benefit justified. I would say somewhere between 6 to 1 and 13 to 1 would be just a ballpark guess. That would put a program like the Clean Construction Act in the top tier in terms of performance.

Senator CARPER. All right. Thank you.

Any other speculators out there who want to take a shot at that?

Mr. LANHAM. Intuitively, Senator, I would agree with what Conrad said, the same or less just because understanding the way equipment operates and where it operates and how it operates, and possible exposures. That makes sense.

Mr. SCHNEIDER. Let me just add one thing because one of the things that Bob said troubled me. I agree with him, but misimpression might have been left. If you are looking at a snapshot in terms of what the cost benefit would be, you are going to put retrofit or do an upgrade today and you are going to see tomorrow what the benefit would be. That is one metric and that is the way EPA typically has looked at this.

But we are talking, as has been established earlier, about pieces of construction equipment that are going to last a long time. So if you looked at it over a period of time, it is much more competitive, much more attractive. You know, if you look at over a period of time, there is a lot more to be said in terms of the value of upgrading this equipment than could be seen just in a quick snapshot. I think that is one of the things being missed in the competitive process a bit. That is kind of under-weighted in the scale of things.

So I think that 13 to 1 for DERA, that is a good number, but I think if you compared them over, you may be comparing a little bit apples to oranges, something that is going to last 5 years, it is

a good benefit. But if you can cleanup something that is going to last 30 years, there is a lot of benefit to that.

Senator CARPER. All right. Thank you.

Anyone else on this question? Before you comment, Mr. O'Keefe, the last question I am going to ask is, I am going to just ask you to, as we wrap up, to just reflect on the testimony of your colleagues at the table, and the conversation that we have had, the questions asked. Just ask you if there is any closing statement. You were asked to make an opening statement, and I will just ask you if there is a closing thought you would like to leave us with.

Mr. O'Keefe, would you go ahead? Please proceed.

Mr. O'KEEFE. Sure. Just on this issue of cost-effectiveness, I think it would be useful to point out that a key component of cost-effectiveness are health benefits, and the pollution mix that is provided by off-road diesel vehicles is not dissimilar from that that would be seen from on-road vehicles. So one would expect a really significant or consistent level of avoided health impacts that would occur from the Clean Construction Act.

So that part of this analysis I think would hold quite firm.

Senator CARPER. OK. Good. Thank you.

All right. Maybe one more. Let's see. Oh, yes. Again, Mr. Schneider, if you have a thought on this. You talked a little bit about this, at least you did, or Mr. Lanham, but I want to come back and just ask for the record and ask you to respond to it again.

Diesel retrofits were supposed to receive priority funding under the Congestion Mitigation and Air Quality Program. However, States have largely avoided using CMAQ funds for these retrofits. Can you again just explain why CMAQ may not be a good fit for diesel retrofits?

Mr. SCHNEIDER. I think, first of all, going forward, with respect to new transportation, it is not clear whether there is going to be a CMAQ Program as it has existed in the past. So I think part of the idea was to create a program that can fit with whatever set of priorities and allocations comes in the new transportation bill. So that is first.

But historically, even though Congress had given a signal that it wanted States to prioritize diesel, and it is something we supported, diesel retrofits under CMAQ, it hasn't happened. So why hasn't it happened?

So one of the reasons is, as we discussed before, contractors typically don't have Federal grant writers on staff to be able to access that money. So that was not a great fit there.

No. 2, with respect to the way that rescissions work under the transportation programs, sometimes early on the SAFETEA-LU process, CMAQ money was one of the first places that States would actually return money to the Federal Government when there were rescissions. So there was just less money available. There were already a lot of competing interests looking to access that money. So once again, diesel retrofit sort of lost out.

I think third, I don't think there was very clear guidance on this point from the Federal Highway Administration. Frankly, I think there was sort of a slip twixt cup and lip between Congress' intent and what FHA really said with respect to how States should do it.

They didn't really know how to do it. They didn't get good guidance. As a result, I think it was just underserved.

So I think there were three things working against it, and that is not to say it wasn't a good idea. We supported it at the time, but the idea is when you live and learn, you learn from experience and try to make things better. I think when we sat down at the end of SAFETEA-LU, the official end of SAFETEA-LU a couple of years ago with AGC, we sort of said, OK, what didn't work here, and how can we make it better.

What we came to Congress with was the set of principles we negotiated which we hope will provide a platform for a better program that will be more effective. We just commend you for picking that up and running with it. So thank you.

Senator CARPER. Sure. Thank you for those thoughts.

OK, I would appreciate each of you making a brief closing comment or thought and sharing with us. That would be great.

Mr. O'Keefe, do you want to lead us off?

Mr. O'KEEFE. Sure. In terms of responding to my fellow panelists, as a former State regulator, I have to say that the notion of ever-tighter EPA national ambient air quality standards, even if they are warranted, pose significant challenges in compliance, as has been pointed out. That really resonated with me. The PM standard is being tightened. The ozone standard looks like it may be tightened.

Even though PM is the trigger for funding under this rule, the rule offers the opportunity to reduce PM, NOx and ozone obviously NOx being a precursor to ozone. The clean fuel benefits have also already succeeded in reducing SO_2 earlier on by moving to lower sulphur fuel. So there are really multiple benefits to moving forward with DERA.

Second, I think that there are opportunities to target from a health-based perspective the next generation of DERA funds. While the first generation has been well used, there are areas where there are significantly higher exposures. These are around ports. These can be around transfer stations. These can be around urban canyons. They can be around industrial sites or construction sites.

These are places where the risks are higher, and the judicious use of these funds could really yield significant health impacts that are greater than just from exposure to ambient air alone. Although there would be ancillary benefits to ambient air reductions as well. So it just makes a lot of sense.

Senator CARPER. That is a very good point. Thank you for mentioning that.

Mr. Parfitt.

Mr. PARFITT. Yes, thank you, Mr. Chairman. In closing, I would say that the DERA Program has been recognized as a voluntary program where it has been well received by industry. It has been well received by the local governments as an opportunity to make these upgrades to their equipment and reduce air emissions.

I think that we have only begun to see the benefits from the DERA Program. There are many other opportunities out there that we have recognized where this program could be utilized. So, I think that the voluntary nature and the significant opportunities

for additional retrofits and upgrades is important and I certainly support the DERA Program.

Senator CARPER. Great. Thanks so much. Thanks for joining us today.

Mr. Lanham.

Mr. LANHAM. Mr. Chairman, it is my first time to ever come to Washington to testify. Thank you for the invitation to be here today. I am honored. It has been a learning experience for me.

Senator CARPER. We have learned from you, too, so it is a two-way street.

Mr. LANHAM. I have been involved with this issue, Mr. Chairman, a long time, and we have found that collaboration and cooperation yields innovative solutions. DERA, your legislation, are examples of innovation. It allows creativity, flexibility, things done in a manner that can be business-friendly and accomplish great goals for the environment. All those are great opportunities ahead. I thank you for the opportunity to be able to participate in that.

Senator CARPER. Great. You have added a lot to the panel and we appreciate very much your input. Thanks.

Mr. Schaeffer.

Mr. SCHAEFFER. Thank you, Senator Carper. It has been our pleasure at the Diesel Technology Forum to be part of the Diesel Emissions Reduction Act history, dating back to the original announcement and introduction of legislation here on Capitol Hill and seeing the first 5 years of the program be so widely successful.

Our only hope is that going forward, we have that same level of commitment and success that we have enjoyed in the past. I think we have learned the voluntary, incentive-based programs can work. It is an innovative policy. It is not a regulation. It is not a mandate. But with the right amount of funding, people can come together and work toward common solutions, and we have seen that here quite substantially.

I would say over time we have also learned a lot. Particulate matter was the initial focus, and I think since then we have learned that upgrading and modernizing existing diesel engines and equipment has a lot of collateral benefit, reductions in NOx and hydrocarbons, and the fuel savings that occur from things like engine re-powers can be quite substantial, and that has lowered CO_2. As you plot a climate strategy ahead, I think those are going to be important considerations for the future.

So we appreciate the opportunity to be involved and you have our continued commitment to do so.

Senator CARPER. All right. Great. Thank you for those comments.

Mr. Schneider, you get the last word here.

Mr. SCHNEIDER. I appreciate it, Senator. Thanks for having me.

I guess what I would say is reflecting on the day here and the panelists' comments is that out in the hinterland, we get the sense that there is pessimism about what Washington can actually accomplish sometimes, particularly in the environmental area. There seems to be a lot of divisiveness around a variety of different environmental topics and so forth. It causes one to question whether there is actually a potential to get something done.

Well, here you have two issues where people have come together: DERA, which has a track record of people coming together and

reaching across the aisle; and clean construction, where at least two of the major stakeholders that are involved, the environmental community and the contractors who are actually working the equipment, agree on a pathway forward.

So it just strikes me that there is an opportunity here to actually accomplish something in both these particular areas. We would commend you for your leadership and as someone who is a problem solver, as someone who is looking for the ability to move things forward. We hope that your colleagues will soon sign up.

So thank you very much.

Senator CARPER. Thank you for your kind words.

Again, I only wish that George Voinovich were here to hear all these kind words being said about the efforts that he led and I was privileged to join him in leading as well, along with a lot of our colleagues.

I again want to thank all of you for coming, for preparing for today, and for responding to the questions from Senator Barrasso and myself. Some of our colleagues who aren't here will have questions and they will be submitting those. They have 2 weeks to submit those questions and materials for the record. I would just ask that when you receive the questions, that you respond promptly to them.

As we go forward, I am reminded of the words of Albert Einstein. Albert Einstein said from time to time, "In adversity lies opportunity. In adversity lies opportunity." We have plenty of adversity when we have tens of thousands of people dying from breathing air with high levels of particulate matter. There is plenty of adversity there.

But there is also opportunity. I think we have seized on that opportunity in enactment of the Diesel Emission Reduction Act. I think we have the potential for doing the same with our clean construction legislation.

The legislation as introduced may not be perfect, but represents certainly a good effort. Hopefully between now and the time we will have a chance before we vote on it, we will have a chance to make it better. We would appreciate your constructive comments and that of others to make it better still.

I want to express my thanks to our staff, both Democrat and Republican, for their work on DERA. A lot of people are part of that coalition, and other folks who have helped us in drafting and preparing the legislation for clean construction.

With that said, I believe this hearing is a wrap and we are done. Thanks so much.

We are adjourned.

[Whereupon, at 4 p.m., the subcommittee was adjourned.]

[Additional statements submitted for the record follow.]

STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Senator Carper, thank you for holding this hearing.

Today's hearing touches on one of the few EPA programs that has bipartisan support. The Diesel Emissions Reduction Act, a voluntary grant and loan program designed to reduce diesel emissions from our Nation's "legacy fleet," was first passed as part of the Energy Policy Act of 2005 and was reauthorized last Congress by voice vote in both chambers. The President signed legislation reauthorizing DERA in the last days of the 111th Congress.

In this context there is great irony in the President's call to strip the program of all funding for the upcoming fiscal year. This is a classic bait-and-switch—a tactic which this President and this EPA are making routine practice. You see, the President knows that Congress will restore the funding. So the move allows him to appear fiscally responsible, knowing full well that the program will continue.

But this move also diverts attention from the other, more problematic programs and regulations where EPA is aggressively moving forward—and with no regard for our Nation's fiscal and economic well-being.

Senator Carper, it is in these other areas that this committee should focus its time.

Take, for example, what's happening with greenhouse gas regulation. Implementation of EPA's cap-and-trade agenda will have ruinous consequences for our economy, with some estimates as high as $400 Billion in lost GDP. These costs come despite the fact that, as Administrator Jackson has confirmed, these rules by themselves will have no impact on reducing global greenhouse gas concentrations. Yet despite what's at stake, this committee has had no oversight hearings on the design or implementation of EPA's GHG rules since they took effect this year.

Another area of great concern is EPA's torrent of rules covering the electric power sector. EPA is set to roll out a suite of rules that will significantly affect the price and availability of electricity for citizens across the United States, including, among others, its Maximum Achievable Control Technology (MACT) rule, the Transport Rule, and new requirements for fly ash and cooling water. These rules, taken together with the agency's greenhouse gas requirements, could cost families and businesses over $300 Billion by 2015 according to a recent analysis by ICF International and the Edison Electric Institute.

But even with an estimated 60 to 100 GW of our Nation's coal-fired electric generating capacity on the line, and reports that the agency's MACT proposal is fraught with technical errors and miscalculations, this committee has called no oversight hearings.

EPA's recently finalized rules governing emissions from industrial and commercial boilers (Boiler MACT) are an example of an agency making a complete debacle of the rulemaking process. In this case, the agency has finalized rules that directly threaten both small and large businesses—as well as municipalities, universities and Federal facilities—due to impractical, costly regulatory requirements. An analysis from Global Insight estimates the rule could put up to 798,250 jobs at risk and reduce U.S. GDP by as much as $1.2 billion. To date, this committee has had no hearings on these rules.

Indeed, the enormous amount of energy that EPA expended in 2010 jamming through its cap-and-trade agenda—a program that was not statutorily required by the CAA and was discretionary on EPA's part—left the agency with insufficient resources to accomplish its main statutorily required tasks. For example, had the agency not tried to do too much at once, it would have had time to correct errors in its Utility MACT proposal that reportedly resulted in proposed standards that are off by a factor of 1000.

Other examples of an agency out of control include the ozone NAAQS reconsideration: a potentially $670 billion hit to GDP; the Cement MACT: $3.4 billion in compliance costs and the potential to shut down 17 plants across the country. These and a variety of other rules in the pipeline—widely and aptly acknowledged as the "EPA Train Wreck"—all point to an agency in pursuit of an ideological agenda with little regard for the costs and practical complications of its rules.

I do appreciate today's hearing. But today I call on you, Senator Carper, and Senator Boxer, to fulfill this committee's oversight obligations by taking an in-depth look at EPA's "Train Wreck" and what it will mean for jobs, energy security, consumers, manufacturers, small businesses, and economic growth.

AGC of America
THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA
Quality People. Quality Projects.

CLEANAIR TASK FORCE

May 11, 2011

The Honorable Thomas R. Carper
Chairman
Clean Air and Nuclear Safety Subcommittee
Environment and Public Works Committee
513 Senate Hart Building
Washington, DC 20515

Dear Chairman Carper:

On behalf of the Associated General Contractors (AGC) and the Clean Air Task Force (CATF), we thank you for your strong leadership in introducing the *Clean Construction Act of 2011*. Your bill provides state transportation officials the authority and funding to require use of clean construction equipment on federally-funded transportation projects in PM2.5 Nonattainment and Maintenance areas. We look forward to working with you in ensuring that your legislation is included in the next surface transportation reauthorization bill.

While diverse in membership and priorities, our organizations share a common interest in improving air quality and ensuring that the next generation of infrastructure projects is built utilizing clean emission control technology. AGC is the oldest and largest construction association in the country, with 96 Chapters and 33,000 member companies; AGC has a presence in every state and local community. Similarly, CATF and their Diesel Clean Up Campaign are supported by 12 national organizations, and are represented locally in 47 states and the District of Columbia.

Our organizations truly overlap and touch every district in the country.

As you are well aware from your work on the Diesel Emissions Reduction Act (DERA); diesel engines are the workhorse of our economy; diesel powers nearly all of the heavy-duty vehicles and equipment that are required to build and repair our roads, bridges, hospitals and schools. Your legislation provides a targeted approach to reducing particulate matter emissions from construction machines that will be used in the areas of the country that are struggling to meet federal air quality standards.

Newly manufactured diesel-powered vehicles and equipment are becoming cleaner every day. Innovative clean diesel technology is achieving near zero emissions, but fleet turnover will take many years. In some cases, emissions from older equipment can be reduced by up to eighty-five percent with the installation of new, cost-effective

technology. Nationwide, there may be as many as two million pieces of construction equipment in use today and many are lacking the most advanced modern particulate pollution controls.

Utilizing cleaner diesel engines in transportation projects is a winning proposition. We thank you again for your leadership, commitment and vision in ensuring that the air we breathe and the projects we build are simultaneously strong and healthy for the communities in which they are built.

Sincerely,

Associated General Contractors of America

Clean Air Task Force

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY 09 2011

OFFICE OF
AIR AND RADIATION

The Honorable Thomas R. Carper
United States Senate
Washington, D.C. 20510-0803

Dear Senator Carper:

Thank you for your April 15, 2011, letter to Administrator Lisa Jackson of the U.S. Environmental Protection Agency regarding the Diesel Emission Reduction Act (DERA) program. The following answers are in response to your questions regarding the current state of the legacy fleet:

Question 1: By 2012, what percentage of the 11 million vehicles and engines in the legacy fleet will be affected by the EPA's new standards for new vehicles and engines?

Answer: *None of the 11 million legacy fleet vehicles will be affected by the EPA's new standards for new vehicles and engines by 2012.*

Question 2: By 2020, what percentage of the 11 million engines in the legacy fleet will be affected by the EPA's standards for new vehicles and engines?

Answer: *In 2020, none of the legacy fleet vehicles will be affected by the EPA's new standards for new vehicles and engines. However, it is important to note that a portion of that legacy fleet will be reduced by 2020, due to fleet turnover.*

Question 3: What percentage of the 11 million vehicles and engines could potentially be impacted by continuing to implement the DERA program in the future?

Answer: *Almost all of the 11 million vehicles and engines within the legacy fleet are eligible under the DERA program but funds are specifically targeted to those vehicles within the legacy fleet that are significant contributors to diesel pollution. The program's objectives are to reduce emissions from the existing fleet through the application of innovative retrofit technologies and to accelerate the rate of turnover for the most polluting heavy-duty diesel engines in the fleet. Reducing emissions from diesel engines is one of the most important public health challenges facing the country. Despite the EPA's stringent diesel engine and fuel standards taking effect over the next decade, diesel engines have long useful lives and remain in the fleet for as much as 30 years.*

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Question 4: What is the benefit to cost ratio of reducing pollution from vehicles and engines impacted by the DERA program?

Answer: *The DERA program is a cost effective way of achieving near term diesel reductions, providing immediate emission reductions from existing diesel engines through engine retrofits, rebuilds and replacements, switching to cleaner fuels, idling reduction strategies and other clean diesel strategies. Depending on the particular type of vehicle and technology combination targeted, the benefit to cost ratio is up to 13:1. The technologies and strategies provided for under DERA can reduce particulate matter (PM) emissions by up to 95 percent and smog-forming emissions, such as hydrocarbons and nitrogen oxide, by up to 90 percent.*

In addition, DERA grants attract matching funds, so for every dollar invested in the program, as many as three dollars are invested by other government agencies, private organizations, industry and non-profit organizations.

Question 5: What would we expect the benefit to cost ratio to be from continuing to implement the DERA program in the future?

Answer: *The Agency does not expect the benefit to cost ratio to change dramatically in the future, and estimates that it will remain up to 13:1. However, as the legacy fleet continues to age and deteriorate, there is a greater potential benefit from retrofitting or replacing those vehicles which would further increase the benefit to cost ratio, since costs are expected to remain the same.*

Question 6: What contribution do emissions from the legacy fleet make in areas that do not attain the National Ambient Air Quality Standards (NAAQS) for PM and ozone?

Answer: *Legacy heavy-duty diesel trucks are known to emit significant amounts of PM, and also NOx, which is one of the main precursors to ozone. Based on projected data for many nonattainment areas in 2014, on-road heavy-duty diesel engines contribute 15-45% of the total PM2.5 emissions from mobile sources, and up to 10% of all PM2.5 emissions (including non-mobile sources). Similarly, these trucks contribute 15-55% of the total NOx emissions from mobile sources, and as much as 40% of all NOx emissions (including non-mobile sources). While these data represent the entire on-road heavy-duty diesel fleet, the legacy fleet is responsible for the vast majority of these emissions as they are the dirtiest engines on the road today and will not be replaced by newer engines for many years to come.*

Question 7: By continuing to implement the DERA program, what immediate public health and air quality benefits could be achieved in those areas currently in non-attainment with NAAQS, as well as those potentially newly designated areas?

Answer: *Immediate public health benefits are achieved with the DERA program, since the moment that an engine is retrofitted with pollution control technology, the community benefits from lower diesel exhaust. The public health benefits attributable to these emission reductions in non-attainment and potentially newly designated areas include a decrease in the risk of premature mortality, hospital admissions for heart and lung disease, respiratory symptoms, and other chronic respiratory illnesses such as asthma. Any reduction in diesel emissions will result in further protection of the population for those in non-attainment areas. In addition, reductions in diesel emissions will help minority and economically disadvantaged populations living near ports and rail yards, who are often disproportionally impacted by diesel engines that are used in goods movement.*

Nearly seventy million people live in 31 areas that are designated nonattainment for the 2006 24-hour PM 2.5. These areas have attainment dates between 2014 and 2019. In addition, over 88 million people live in areas that are in nonattainment for the annual PM standard. These areas have attainment dates between 2009 and 2014. The technologies and strategies provided for under DERA can reduce PM emissions from the legacy fleet by up to 95 percent and smog-forming emissions, such as hydrocarbons and nitrogen oxide, by up to 90 percent.

Again, thank you for your letter. If you have further questions, please contact me or your staff may call Josh Lewis in the EPA's Office of Congressional and Intergovernmental Relations at (202) 564-2095.

Sincerely,

Gina McCarthy
Assistant Administrator

Testimony by Timothy Regan
Senior Vice President
Corning Incorporated

Written Testimony for the U.S. House Committee on Transportation and Infrastructure
Listening Session
Thursday March 24, 2011

Good morning, Mr. Chairman and Mr. Reed. Thank you for the opportunity to speak to you today. My name is Tim Regan and I am a Senior Vice President with Corning Incorporated. We are headquartered in Corning, New York.

I'm here today to talk about streamlining the air quality provisions of the SAFETEA-LU and making them more cost-effective.

Corning Background

Corning is the world's leading manufacturer of high technology glass and glass ceramic components used in a range of applications from consumer electronics to transportation. Our commitment to innovation has been the key to our success. Because of this commitment to R&D, we have many fundamental inventions to our credit and have been the recipient of the President's Medal of Technology four times.

One of our important inventions is the ceramic substrate material and related manufacturing process that is used in the core of the catalytic converter. This invention has had profound effect on the environment removing over 1.5 million tons of pollution from America's skies since its creation in 1975.[1] This has led to other inventions and innovations in the environmental space.

Most recently, we developed a family of materials and processes to manufacture diesel particulate filters, diesel oxidization catalysts, and devices for selective catalytic reduction. These devices virtually eliminate the smoke and smell from diesel exhaust. In fact, testing we have done in Corning, NY, shows that, after filtration with our device, air emitting from the diesel engine is cleaner than the air that enters the carburetor.

Diesel Priority in CMAQ

Diesel emissions control technology has been proven to be very cost effective. Estimates under the Diesel Emissions Reduction Act show that every dollar spent to retrofit existing diesel vehicles with this technology generates $20 of benefit.[2]

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[1] See *Corning Research Team Awarded National Medal of Technology for the Invention of the Cellular Ceramic Substrate*, http://www.corning.com/environmentaltechnologies/publications/ect_archives/ECT2005-1-article4.aspx; sourced March 29, 2011

[2] See *Report to Congress: Highlights of the Diesel Emissions Reduction Program*, August 2009; EPA-420-R-09-006, pg. 34.

In fact, this technology is so cost-effective that legislators decided in SAFETEA-LU to make the installation of this technology on existing vehicles a priority in spending under the CMAQ program. This decision was buttressed by an analysis of cost effectiveness that Congress requested from the Transportation Research Board (TRB). The TRB study, published in 2002, concluded that CMAQ dollars could be more cost effectively expended to reduce emissions of fine particulate matter – PM2.5 – than for other uses. Because diesel engines are the primary source of PM2.5 emissions in the transportation sector, Congress targeted diesel retrofits as a priority under CMAQ.

This made good sense because of the cost effectiveness of the technology. Using the TRB methodology, the Diesel Technology Forum estimates that re-powering a non-road vehicle is 15 times more cost effective than building a bike path -- $5,390 per ton for re-powering versus $84,100 per ton for a bike path.[3] Similarly, the Emissions Control Technology Association estimates the cost effectiveness of installing a diesel particulate filter on a non-road vehicle is almost 16 times more cost effective than purchasing an alternative-fuel bus -- $1,406 per ton for a DPF versus $21,937 per ton for an alternative-fuel bus.[4]

Unfortunately, the CMAQ priority language for diesel retrofits did not work very well.

AGC/CATF Clean Construction Principles

So, our colleagues from the Associated General Contractors of America and the Clean Air Task Force joined in an effort to develop an alternative clean construction initiative that is streamlined and cost effective. While Corning does not represent these groups, we admire the progress that they have made and commend it to you for consideration. To their credit, they have published a set of Clean Construction Principles which I'd like to submit for the record along with testimony to provide some useful background. Here's how the principles would work in practice:

- Step 1: After a contract is awarded for a Federally-funded project located in a PM2.5 non-attainment or maintenance area, the successful bidder would identify the non-road diesel-powered equipment it intends to use on the project for at least 10 days.

- Step 2: By change order, the State DOT would require the bidder to employ a wide range of diesel emission technologies on the equipment identified in Step 1 to achieve the maximum feasible reduction of PM2.5.

- Step 3: The cost of the diesel retrofit would be passed through as a project expense, which is very important for two reasons: (1) contractors will not have to bear the cost of the retrofit; and (2) no bidder will be disadvantaged because their equipment is older and has not been retrofitted.

- Step 4: The State would be given the option of crediting the emissions reductions achieved under these Principles to their SIP or using the reductions for conformity credit.

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[3] See *Retrofitting America's Diesel Engines,* Diesel Technology Forum, November 2006, pg. 3.
[4] See letter from Emissions Control Technology Association, Appendix, pg. 6, dated February 20, 2007, submitted to the Docket Management System, U.S. Department of Transportation, Docket No. FHWA-2006-26383.

Cost

Obviously, cost is an issue. To get a handle on it, we commissioned a study to examine 10 clean construction projects around the country to determine the cost of the diesel retrofit relative to the total project cost. This study will soon be completed. At this time, we believe that a cap of 1% of the contract cost would be sufficient to implement the Clean Construction Principles.

Conclusion

Thank you again, Mr. Chairman and Mr. Reed, for the opportunity to participate today. In closing, Mr. Chairman and Mr. Reed, please let me commend the Clean Construction Principles developed by AGC and the CATF for consideration in the re-authorization bill that you will be reporting out of your Committee sometime this year.

City of Chicago
Richard M. Daley, Mayor

Department of Environment

Permitting & Enforcement Division

Suzanne Malec-McKenna
Commissioner

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May 11, 2011

Tom Carper, U.S. Senator
Chairman, Subcommittee on Clean Air and Nuclear Safety
513 Hart Senate Office Building
Washington, DC 20510

Re: Statement in support of federal diesel emissions reduction programs

Dear Chairman Carper,

I am pleased to have this opportunity to provide testimony about the importance of diesel emissions reduction programs to the City of Chicago.

It is well known that diesel exhaust contains a variety of pollutants such as nitrogen oxides, carbon monoxide, carbon dioxide, particulate matter and other chemicals that form ground-level ozone. These pollutants impact human health and the environment and contribute to climate change.

According to the United States Environmental Protection Agency (USEPA), the City of Chicago is in non-attainment for ozone and fine particulate matter. Diesel engines are sources of nitrogen oxide (which forms ozone) and particulate matter. Indeed, the Illinois Environmental Protection Agency has found that diesel vehicles and construction equipment are the number one contributor of nitrogen oxides in Cook County, Illinois.

Fortunately, due to increasingly stringent emissions standards promulgated by the USEPA, newly manufactured diesel engines will be cleaner than they were before. However, because diesel engines can remain in service for 20 - 30 years, a legacy fleet of dirtier vehicles and equipment will remain in use for a number of years.

For these reasons, the Chicago Department of Environment (CDOE) has worked on several recent initiatives to reduce diesel exhaust. The City's anti-idling law, introduced by Mayor Richard M. Daley and passed in late 2009, established a 3-minute idling limit on on-road diesel-powered vehicles. CDOE and other City departments are actively enforcing the anti-idling ordinance and working to increase awareness about the ordinance.

In addition, earlier this month, the Mayor Daley introduced and the Chicago City Council passed the Clean Diesel Contracting Ordinance to improve air quality around large City-funded construction projects. This ordinance will reduce diesel emissions by requiring the use of cleaner fuels and the retrofitting of older equipment and/or purchase of newer, cleaner equipment on City-funded/City-awarded construction projects in the amount of $2 million or more.

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CHICAGO WORKS

The Clean Diesel Contracting Ordinance requirements will be phased in over time, beginning with the requirement to minimize idling and use ultra low sulfur diesel fuel starting in June 2011. In 2014, contractors will be required to inventory all equipment on a job site and ensure that their fleets achieve a specified average Clean Fleet Score established under the ordinance. This will result in an overall reduction in diesel emissions, greatly benefiting air quality, while also helping to drive the market for cleaner equipment and aftermarket emissions reduction devices. (Attached is a summary document that provides additional details about the ordinance.)

The City of Chicago is also working to reduce diesel emissions from City fleets. Towards this end, the USEPA's National Clean Diesel Funding Assistance Program, funded through the Diesel Emissions Reduction Act (DERA), has been a vital program. In 2009, the City received a $1 million grant from the DERA program. With this grant, the City installed 235 diesel-fired heaters on medium- and heavy-duty trucks (primarily snow plows and refuse trucks) and partially funded 3 new hybrid diesel electric aerial trucks to replace older vehicles.

The City supports DERA funding for FY 2012, equal to the levels appropriated in FY 2008. Future funds could support additional projects in Chicago to reduce emissions from private, City and Sister Agencies' diesel vehicle and equipment fleets. Given the regional nature of air pollution, funds to neighboring municipalities will also be beneficial to Chicago's air quality.

Finally, while Chicago has been a leader on numerous environmental issues, federal action is also extremely important. I would encourage Congress to pass legislation that is consistent with the goals of Chicago's Clean Diesel Contracting Ordinance.

Thank you for your kind consideration of these important issues.

Sincerely,

Suzanne Malec-McKenna
Commissioner

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Written Testimony of Larry Schafer,
Senior Advisor to the National Biodiesel Board

Submitted To the Senate Committee on Environment and Public Works
Subcommittee on Clean Air and Nuclear Safety
"Federal Efforts to Protect Public Health By Reducing Diesel Emissions"

United States Senate
May 12, 2011

Executive Summary: Biodiesel is a renewable, low carbon diesel replacement fuel. It is the only domestically produced, commercial scale Advanced Biofuel – as defined by the Environmental Protection Agency (EPA) under the Renewable Fuels Standard (RFS2) program - that meets the specific ASTM D6751 fuel specification and is readily available and accepted in the U.S. marketplace. (Note: Biomass-based Diesel is an Advanced Biofuel under the RFS2 program, and in general, U.S. biodiesel produced from animal fats, recycled cooking oil, soybean oil, inedible corn oil derived from the ethanol production process, canola and algae qualifies as Biomass-based Diesel).

In order to capture the goals and benefits of the RFS2, which include dramatic emissions reductions, the U.S. biodiesel industry encourages Congress to promote stability and predictability in the fuels marketplace by refraining from legislative revisions or restrictions that could hinder administration of the RFS2 program.

Since 2005, biodiesel has reduced lifecycle greenhouse gas emissions by 35.4 billion pounds the equivalent of removing 3.12 million passenger vehicles or from America's roadways.

In 2011 and 2012 the U.S. biodiesel industry is on track to use an additional 1.8 billion gallons of biodiesel consistent with requirements of the EPA's renewable fuel program (RFS2) Advanced Biofuel goals. Statute requires the use of 800 million gallons of Biomass-based Diesel in 2011 and 1 billion gallons of Biomass-based Diesel in 2012. The use of 1.8 billion gallons of biodiesel will further reduce greenhouse gas emissions by an additional 29.02 billion pounds and the equivalent of removing an additional 2.52 million passenger vehicles from America's roadways.

The U.S. has more than enough production capacity and available qualifying feedstock to meet the RFS2 Biomass-based Diesel volume targets for 2011 and 2012. Specifically, there is more than 2.12 billion gallons of domestic Biomass-based Diesel production capacity registered with the EPA under the RFS2 program and ample feedstock supply to meet the statutory targets for 2011 and 2012.

Meeting the Advanced Biofuels goals provided for in the RFS2 program will allow the U.S. to recognize the energy security, job creation and environmental benefits associated with the

expanded domestic production and use of biodiesel, and the U.S. biodiesel industry stands ready to meet the attainable volume of the Advanced Biofuel goals provided for in RFS2.

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Chairman Carper, Ranking Member Sessions and Members of the Subcommittee, I appreciate the opportunity to submit written testimony on behalf of the National Biodiesel Board (NBB) regarding this hearing on Federal Efforts to Protect Public Health By Reducing Diesel Emissions." As producers of America's only commercial scale Advanced Biofuel, the U.S. biodiesel industry looks forward to working constructively with this Subcommittee and the full committee to ensure that diesel fuel emissions are reduced and our nation's Advanced Biofuel goals are met.

About NBB: NBB is the national trade association representing the biodiesel industry as the coordinating body for research and development in the U.S. It was founded in 1992, and since that time, the NBB has developed into a comprehensive industry association which coordinates and interacts with a broad range of cooperators including industry, government and academia. NBB's membership is comprised of biodiesel producers; state, national and international feedstock and feedstock processor organizations; fuel marketers and distributors; and technology providers.

Background and Industry Overview: Biodiesel is a renewable, low carbon diesel replacement fuel. The EPA has determined, based on the performance requirements established by the *Energy Independence and Security Act* (EISA) (P.L. 110-140), that domestically produced biodiesel is an Advanced Biofuel under the RFS2 program.

Biodiesel is made from waste greases like recycled cooking oil, animal fats and secondary use agricultural oils, and is refined to meet a specific commercial fuel definition and specification. The fuel is produced by reacting feedstock with an alcohol to remove the glycerin and meet the D6751 fuel specification set forth by ASTM International. Biodiesel is one of the most and best-tested alternative fuels in the country and the only alternative fuel to meet all of the testing requirements of the 1990 amendments to the Clean Air Act. There are approximately 150 biodiesel plants registered with the EPA, representing a combined production capacity in excess of 2.12 billion gallons.

Biodiesel is primarily marketed as a five percent (B5) blending component with conventional diesel fuel, but can be used in concentrations up to twenty percent (B20). It is distributed utilizing the existing fuel distribution infrastructure with blending occurring both at fuel terminals and "below the rack" by fuel jobbers.

Biodiesel Reduces Diesel Emissions: Emissions from traditional diesel – primarily from trucking fleets, school buses and other vehicles – are a significant health and air quality concern. In an update to its National-Scale Air Toxics Assessment earlier this year, the Environmental Protection Agency (EPA) cited diesel exhaust as one of the nation's most dangerous pollutants, saying it is "among the substances that may pose the greatest risk to the U.S. population."

Biodiesel is a clean-burning replacement fuel that can be used in existing diesel engines and is produced from renewable sources -- animal fats, recycled cooking oil, soybean oil, inedible corn oil derived from the ethanol production process, canola and algae. Biodiesel is the first and only commercial-scale fuel widely used today that meets the EPA's definition as an Advanced Biofuel. Along with significant reductions in greenhouse gas emissions, it dramatically reduces nearly every major toxic air pollutant, according to the EPA.

Thousands of trucks and buses hit the road every day burning traditional diesel fuel, and using larger amounts of diesel fuel blended with biodiesel is the simplest, most effective way to immediately improve emissions. Along with creating U.S. jobs and reducing our reliance on foreign oil, improving air quality is a major reason why domestically produced biodiesel must play a critical role in the nation's fuel mix.

According to the EPA, biodiesel has the following emissions properties compared with petroleum diesel:

- Carbon Monoxide – The exhaust emissions of carbon monoxide (a poisonous gas) from biodiesel are on average 48 percent lower than carbon monoxide emissions from diesel.

- Particulate Matter – Breathing particulate has been shown to be a human health hazard. The exhaust emissions of particulate matter from biodiesel are about 47 percent lower than overall particulate matter emissions from diesel.

- Hydrocarbons – The exhaust emissions of total hydrocarbons (a contributing factor in the localized formation of smog and ozone) are on average 67 percent lower for biodiesel than diesel fuel.

- Sulfur emissions – The exhaust emissions of sulfur oxides and sulfates (major components of acid rain) from biodiesel are essentially eliminated compared to diesel.

- Nitrogen Oxides – NOx emissions from biodiesel increase or decrease depending on the engine family and testing procedures. NOx emissions (a contributing factor in the localized formation of smog and ozone) from pure (100%) biodiesel increase on average by 10 percent. However, biodiesel's lack of sulfur allows the use of NOx control technologies that cannot be used with conventional diesel. Additionally, some companies have successfully developed additives to reduce Nox emissions in biodiesel blends. Biodiesel reduces the health risks associated with petroleum diesel.

- Biodiesel emissions show decreased levels of polycyclic aromatic hydrocarbons (PAH) and nitrated polycyclic aromatic hydrocarbons (nPAH), which have been identified as potential cancer causing compounds. In Health Effects testing, PAH compounds were reduced by 75 to 85 percent, with the exception of benzo(a)anthracene, which was reduced by roughly 50 percent. Targeted nPAH compounds were also reduced dramatically with biodiesel, with 2-nitrofluorene and 1- nitropyrene reduced by 90 percent, and the rest of the nPAH compounds reduced to only trace levels.

RFS2 Provides for Emissions Reducing Renewable Component in U.S. Diesel Fuel: Biomass-based Diesel is an Advanced Biofuel under the RFS2 program, and in general, U.S. biodiesel produced from animal fats, recycled cooking oil, soybean oil, inedible corn oil derived from the ethanol production process, canola and algae qualifies as Biomass-based Diesel. The U.S. biodiesel industry is today the only domestic, commercial scale producers of Biomass-based Diesel.

To qualify as Biomass-based Diesel, the fuel must reduce greenhouse gas (GHG) emissions by 50% compared to conventional petroleum diesel. In addition, the fuel must be produced from qualifying renewable biomass, as defined by statute under EISA.

RFS2 requires the use of 800 million gallons of Biomass-based Diesel in 2011 and 1 billion gallons in 2012. From 2013 through 2022, a minimum of 1 billion gallons must be used, and the Administrator of the EPA, in consultation with the Secretary of Agriculture and the Secretary of Energy, is given the authority to increase the Biomass-based Diesel volume requirement.

By statute, the RFS2 Program addresses several specific policy goals as it pertains to biodiesel and the nation's overall mix of transportation fuels. First, to achieve nationwide goal of displacing foreign petroleum, the RFS2 program in general and the Biomass-based Diesel volume requirement specifically ensures that minimum goals for petroleum diesel displacement are met. In addition, the RFS2 achieves the desired policy goal of reducing GHG emissions associated with the use of transportation fuels.

Biodiesel Public Policy Benefits: Moving forward, the RFS2 program will help achieve the worthwhile policy goal of increasing the production and use of Advanced Biofuels in the U.S. There are compelling public policy benefits associated with the enhanced production and use of biodiesel in the U.S.

Biodiesel Reduces our Dependence on Foreign Oil: Biodiesel can play a major role in expanding domestic refining capacity and reducing our reliance on foreign oil. The 2.2 billion gallons of biodiesel produced in the U.S. since 2005 has displaced an equivalent amount of diesel fuel with a clean-burning, efficient fuel that reduces lifecycle carbon dioxide emissions by as much as 86 percent compared to petroleum diesel fuel and creates 4.56 units of energy for every unit of energy that is required to produce the fuel.

Biodiesel is Good for the Environment: Biodiesel is an environmentally safe fuel, and is the most viable transportation fuel when measuring its carbon footprint, life cycle and energy balance. Based on EPA's lifecycle analysis, biodiesel reduces GHG emissions by as much as 86 percent when compared to petroleum diesel fuel. Since 2005, biodiesel's contribution to reducing greenhouse gas emissions is equal to removing 3.12 million passenger vehicles from America's roadways.

Biodiesel's emissions significantly outperform petroleum diesel. Biodiesel emissions have decreased levels of all target polycyclic aromatic hydrocarbons (PAH) and nitrated PAH compounds, as compared to petroleum diesel exhaust. These compounds have been identified as potential cancer causing agents.

Biodiesel is the only alternative fuel to voluntarily perform EPA Tier I and Tier II testing to quantify emission characteristics and health effects. That study found that B20 (20 percent biodiesel blended with 80 percent conventional diesel fuel) provided significant reductions in total hydrocarbons; carbon monoxide; and total particulate matter. Research also documents the fact that the ozone forming potential of the hydrocarbon emissions of pure biodiesel is nearly 50 percent less than that of petroleum fuel. Pure biodiesel typically does not contain sulfur and therefore reduces sulfur dioxide exhaust from diesel engines to virtually zero.

The Biodiesel Industry is Creating Green Jobs and Making a Positive Contribution to the Economy: In 2011, the NBB estimates that the U.S. biodiesel industry will support over 30,000 jobs in all sectors of the economy. This will add more than $3 billion to the nation's Gross Domestic Product (GDP).

The Biodiesel Industry Stimulates Development of New Low-Carbon Feedstocks: The feedstock used to produce U.S. biodiesel has increasingly diversified, with waste products such as animal fats, recycled cooking oil and other inedible waste agricultural oils making up more than half of the feedstock used to produce fuel. Biodiesel production is currently the most efficient way to convert lipids into low-carbon diesel replacement fuel, and as a result, industry demand for less expensive, reliable sources of fats and oils is stimulating promising public, private and non-profit sector research on second generation feedstocks such as algae.

U.S. Biodiesel Industry is Prepared to Meet RFS2 Advanced Biofuel Goals Established by Congress: The U.S. has more than enough production capacity and available qualifying feedstock to meet the RFS2 Biomass-based Diesel volume targets for 2011.

Specifically, there is more than 2.12 billion gallons of domestic Biomass-based Diesel production capacity registered with the EPA under the RFS2 program to meet the statutory targets for 2011 and 2012. Further, there is ample feedstock to support the production of Biomass-based Diesel production at levels in excess of the RFS2 program's Advanced Biofuel volume obligations. By conservative estimates, there is domestic feedstock available to support 1.77 billion gallons of annual biodiesel production in the United States, which is more than is required under the RFS2 for 2011.

Biodiesel is fungible in the nation's fuel infrastructure. It is worthwhile to note that 84 registered terminals have officially installed biodiesel blending capacity at the terminal rack, and that number is certain to grow. Biodiesel meets ASTM D6751, a specific performance-based commercial fuel specification formulated by ASTM International, which is widely accepted in the marketplace. Biodiesel blends are widely distributed via pipelines in Europe, and currently, biodiesel is being distributed by pipeline in a number of U.S. markets. Pipeline distribution will also expand as minor technical issues pertaining to the comingling of fuels are resolved.

The combination of necessary production capacity; available feedstock; and a fuel that is fungible in the marketplace ideally positions the U.S. biodiesel industry to meet and exceed the 2011 Advanced Biofuel goals established by the RFS2 program.

Biodiesel Marketplace Needs Stable and Reliable Regulatory Framework: At this early stage of the U.S. biodiesel industry's development, the rules governing the Advanced Biofuel volume requirements under the RFS2 program have a significant impact on the biodiesel marketplace. The delay in finalizing regulatory guidance to the private sector (final rule was signed 25 months after enactment of EISA, and 13 months beyond the program's statutory effective date) created uncertainty in the biofuels marketplace, which in turn hindered the ability of businesses to access capital and make long-term investment decisions.

Conversely, the conclusion of the 25 month rulemaking process and implementation of the RFS2 Advanced Biofuel program removes uncertainty and provides clear guidance to the marketplace. A stable regulatory environment in 2011 will allow the U.S. biodiesel industry to meet the nation's overall goals of displacing at least 800 million gallons of petroleum diesel with a domestically produced and commercially viable Advanced Biofuel that significantly outperforms the emission profile of conventional petroleum diesel fuel.

The U.S. biodiesel industry wants to work constructively with Congress to ensure that the RFS2 program is administered in a manner that provides a stable regulatory environment for Advanced Biofuel producers and other marketplace stakeholders. Towards this end, the U.S. biodiesel industry would ask Congress to avoid statutory restrictions on the routine rulemaking procedures that are needed to administer the RFS2 program. Similarly, the NBB encourages Congress to avoid legislative revisions to RFS2 that could undermine marketplace and investor confidence in the program.

Conclusion: The U.S. biodiesel industry is proud to produce the only domestic, emissions reducing commercial scale Advanced Biofuel that is readily available and accepted in the marketplace. Further, NBB's membership has both the production capacity and available feedstock to meet the RFS2 program's Advanced Biofuel goals. The U.S. biodiesel industry stands ready to meet the nation's Advanced Biofuel requirements.

In addition, continued implementation of the RFS2 program will allow our nation to reap the significant emissions reducing, energy security, economic, and environmental benefits associated with displacing petroleum diesel fuel with Advanced Biofuels like biodiesel. Accordingly, the U.S. biodiesel industry encourages Congress to promote stability and predictability in the fuels marketplace by refraining from legislative revisions or restrictions that could hinder administration of the RFS2 program.

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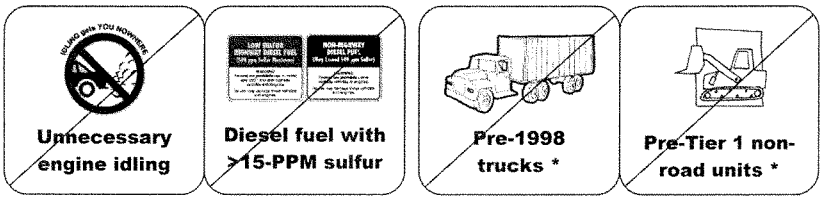
Chairman Carper, Ranking Member Sessions and Members of the Subcommittee, I again appreciate having the opportunity to submit written testimony on this issue of significant importance to the U.S. biodiesel industry.

City of Chicago Clean Diesel Contracting Ordinance Summary

Prohibited under contract solicitations...

Beginning June 1, 2011 — *Actions*

Beginning in 2014 — *Fleet Inventory*



** Pre-1998 truck and pre-Tier 1 non-road equipment allowed if retrofitted. See next page.*

Clean Fleet Scores required—for all diesel vehicles and equipment as an average score—under contracts beginning on...

2.1	3.0	4.0
January 1, 2014	January 1, 2017	January 1, 2020

USEPA's Non-road Emissions Tier Implementation: Tier 1: 1996 thru 2000, Tier 2 and 3: 2000 thru 2008, Tier 4: 2008 thru 2015

The responsibilities of each *prime* contractor for applicable contracts beginning in 2014

Compliance Plan

After Notice to Proceed, submit a brief, written plan to comply with the Clean Fleet Score. Include planned subcontractor compliance.

Self-reporting and Scoring

Submit a report each reporting period (60 days) showing all covered vehicles and equipment used in performance of the contract (by prime and all sub-contractors) and self score using the provided scoring system.

Points can be earned by these qualifying vehicle and equipment types

"Tiers" are emissions standards for non-road diesel units. Emissions standards for on-road vehicles are designated by engine model year. "Levels" are emissions standards for diesel retrofit devices. All of these emissions standards are established by the US Environmental Protection Agency.

Clean Fleet Score Points Earned	Non-road Tiers, on-road engine model years and retrofit device Levels
0	Pre-2003-emissions on-road diesel vehicle (not retrofitted) Tier 1 non-road equipment (not retrofitted)
1	2004-06-emissions on-road diesel vehicle (not retrofitted) Any diesel unit retrofitted with Level 1 device
2	Tier 2 non-road equipment (not retrofitted)
2.25	Tier 3 non-road equipment (not retrofitted)
3	Any diesel unit retrofitted with Level 2 device 2004-06-emissions on-road alternative-fuel vehicle
4	2007-09--emissions on-road diesel or alternative-fuel vehicle (not retrofitted) Tier 4 non-road equipment (not retrofitted) Any diesel unit retrofitted with a Level 3 device
5	2010-emissions or later on-road diesel or alternative-fuel vehicle Any diesel unit retrofitted with a Level 3+ device

USE OF 20% BIODIESEL ADDS ½ POINT TO EACH OF THE ABOVE SCORES

Types of qualifying diesel retrofit devices

Level 1	Level 2	Level 3	Level 3+
Diesel oxidation catalysts (reduce particulate matter by 25%)	Partial diesel-particulate filters(reduce particulate matter by 50%)	Full diesel-particulate filters (reduce particulate matter by 85%)	Diesel particulate filter plus selective catalytic reduction (reduces Nitrogen Oxide)

Clean Fleet Score Annual Waiver Certification

A partial hardship waiver is available for smaller contractors (i.e. those that own or lease vehicles/equipment with a total horsepower of 2,500 or less for their fleet). A firm may apply to the commissioner of environment for an annual waiver certificate if the firm determines it would suffer an undue financial hardship.