Third Report to Congress:

Highlights from the Diesel Emission Reduction Program

United States Environmental Protection Agency

EPA-420-R-16-004
February 2016

Acronyms and Abbreviations

CCV	Closed Crankcase Ventilation
CO	Carbon Monoxide
CO2	Carbon Dioxide
DERA	Diesel Emissions Reduction Act
DOC	Diesel Oxidation Catalyst
DPF	Diesel Particulate Filter
EPA	Environmental Protection Agency
ET	Emerging Technologies
FY	Fiscal Year
HC	Hydrocarbon
NAAQS	National Ambient Air Quality Standards
NCDC	National Clean Diesel Campaign
NO_X	Nitrogen Oxides
PM	Particulate Matter
Recovery Act	American Reinvestment and Recovery Act
RFP	Request for Proposals

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Executive Summary

From goods movement to building construction to public transportation, diesel engines are the modern-day workhorse of the American economy. Though diesel engines are reliable and efficient, older ones emit significant amounts of exhaust including particulate matter (PM) and nitrogen oxides (NO_X), which can harm human health. Despite the recent implementation of the U.S. Environmental Protection Agency's (EPA) most stringent emissions standards, approximately 10.3 million older diesel engines remain in use[1]. EPA began awarding clean diesel grants in 2008 under the Diesel Emissions Reduction Act (DERA), a grant program created by Congress as part of the Energy Policy Act of 2005 to reduce diesel exhaust from these older engines.

EPA's National Clean Diesel Campaign (NCDC) within the Office of Transportation and Air Quality administers the DERA grants. EPA awarded the first DERA grants in 2008, the American Recovery and Reinvestment Act (Recovery Act) grants in 2009, and grants from funds appropriated in Fiscal Years (FY) 2009 through 2015. This Third Report to Congress covers final results from the Recovery Act and FYs 2009-2011 and estimated results and benefits from funding in FY 2011-2013.[2]

DERA Funding Has Provided a Broad Range of Benefits

Since 2009, the DERA program has achieved impressive outcomes and a range of benefits, summarized in Exhibit 1. **See Exhibit 4 for cumulative impacts.**

Exhibit 1: DERA Program Benefits and Accomplishments (FYs 2009-2013)

Investment of DERA Program	Emission and Fuel Reductions
$520 million funds awarded	312,500 tons of NO_x
58,800 engines retrofitted or replaced	12,000 tons of PM
Up to $11 billion in monetized health benefits	18,900 tons of hydrocarbon
Up to 1,700 fewer premature deaths	58,700 tons of carbon monoxide
81% of projects targeted to areas with air quality challenges	4,836,100 tons of carbon dioxide
3:1 leveraging of funds from non-federal sources	431 million gallons of fuel

Improved air quality and public health

DERA grants have funded projects that provided immediate health and environmental benefits. From 2009 to 2013, EPA awarded $520 million to retrofit or replace 58,800 engines in vehicles, vessels, locomotives or other pieces of equipment. EPA estimates that these projects will reduce emissions by 312,500 tons of NO_X and 12,000 tons of $PM_{2.5}$ [3] over the lifetime of the affected engines. As a result of these pollution reductions, EPA estimates a total present value of up to $11 billion in monetized health benefits over the lifetime of the affected engines, which include up to 1,700 fewer premature deaths associated with the emission reductions achieved over this same period.[4,5] These clean diesel projects also are estimated to reduce 18,900 tons of hydrocarbon (HC) and 58,700 tons of carbon monoxide (CO) over the lifetime of the affected engines.

Served disproportionately impacted communities

Many projects have made health and environmental impacts in socially and economically vulnerable areas. Goods movement projects are especially beneficial because they tend to take place in communities that are disproportionately impacted by higher levels of diesel exhaust, such as those near ports, rail yards, and distribution centers. Clean diesel projects reduce exposure for people living in these communities, and the improved air quality provides immediate health benefits. Since the first DERA grants in 2008, EPA has increasingly focused attention on PM and ozone nonattainment areas to achieve maximum benefits for every dollar spent. For projects awarded in FY 2009 to FY 2013, 81% were located in areas with air quality challenges.

Improving Air Quality and Public Health: Urban Trucking and School Bus Fleets

The Southwest Detroit Environmental Vision (SDEV) diesel project focused on decreasing diesel emissions through the retrofit of various diesel vehicles including the replacement of 24 medium heavy-duty diesel trucks and eight school buses.

Photo Courtesy of *Southwest Detroit Environmental Vision*

SDEV received a total of $1.2 million in grant funding to work with Greater Lansing Area Clean Cities, NextEnergy Center, and nine fleet partners. This project impacted multiple economically disadvantaged and underserved urban areas in Michigan (Detroit, Dearborn, Flint, Lansing), as well as vulnerable populations in suburban and rural areas with poor air quality.

Reduced climate impacts and improved fuel savings

DERA projects covered in this report (FYs 2009-2013) are estimated to reduce 4,836,100 tons of carbon dioxide (CO_2) over the lifetime of the affected engines and save over 431 million gallons of fuel as a result of idle reduction and more fuel-efficient technologies. Black carbon (BC) is a component of PM and has been linked to a range of climate impacts, including increased temperatures and accelerated snow melt. BC also contributes to adverse health impacts associated with PM exposure. Particles emitted by legacy mobile diesel engines are about 75% BC, so reductions in these BC-rich sources also likely provide climate benefits. DERA projects provide immediate BC reductions by reducing PM emissions from the legacy fleet of diesel engines, including approximately 8000 tons of $PM_{2.5}$ over the lifetime of the projects covered in this report.

Focused on goods movement and the supply chain

DERA funding has focused on diesel pollution at intermodal hubs, such as ports and delivery centers, and across the nation's transportation infrastructure that supplies goods. In doing so, we are modernizing the diesel powered equipment that moves our economy by transporting goods throughout the nation. EPA will continue to target specific fleets in high diesel exposure areas such as near ports and freight distribution hubs and other disproportionately affected communities.

Generated economic and environmental activity.

Clean diesel projects are cost-effective, according to EPA's calculations of health benefits. Each federal dollar invested in clean diesel projects has leveraged as much as $3 from other government agencies, private organizations, industry, and nonprofit organizations, generating between $5 and $21 in public health benefits. DERA funding has impacted a variety of sectors and supported many clean diesel technologies. New clean diesel technologies help spur environmental jobs and innovation in the marketplace.

Answered popular demand.

Stakeholders have shown a tremendous amount of interest in EPA-funded clean diesel projects. Funding requests have exceeded availability by as much as 35:1 for our National Clean Diesel Rebate Program and 7:1 for our national grant competitions since the inception of DERA. These requests highlight DERA's ongoing potential to meet the nation's need for diesel emission reductions and fleet turnover incentives.

Met local needs.

EPA is committed to engaging local communities through clean diesel projects, and targets projects that will be able to continue to provide benefits after the project period has closed. These grants have addressed local environmental and public health problems as DERA grant recipients tailor projects to the needs of each individual community.

Cumulative Impacts and Project Locations Since 2008

In the early years of DERA, many applicants requested funding for retrofits of on-highway vehicles, especially long-haul trucks and school buses, and use of alternative fuels such as B20. As the DERA program progressed and EPA's on-highway 2007 standards were implemented, applicants sought to repower larger vehicles, vessels and equipment in ports and rail yards. Exhibit 2 shows the most frequently funded sectors for the Recovery Act and FY 2009-2013. Exhibit 3 shows the most frequently funded technologies for the Recovery Act and FY 2009-2013.[6]

Exhibit 2: DERA Funded Sectors 2009-2013

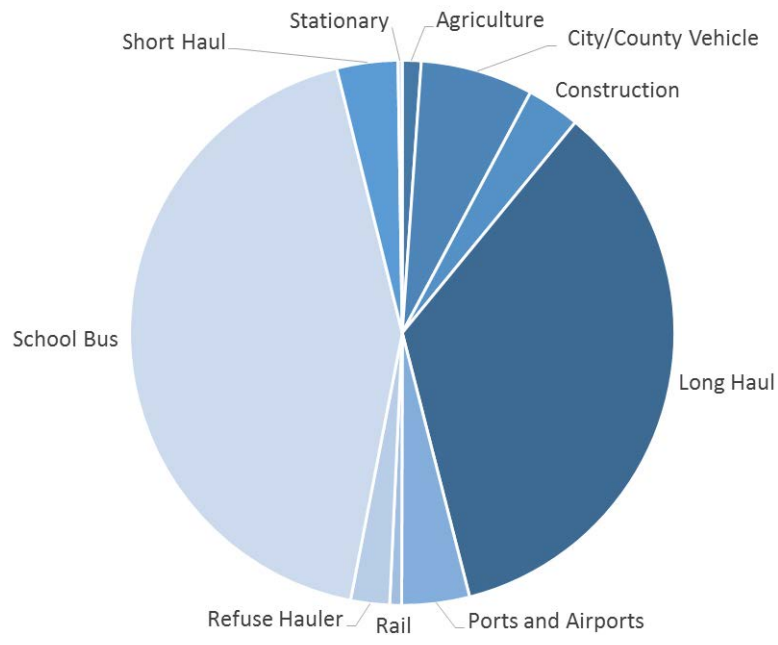


Exhibit 3: DERA Funding by Technology Type, 2009-2013

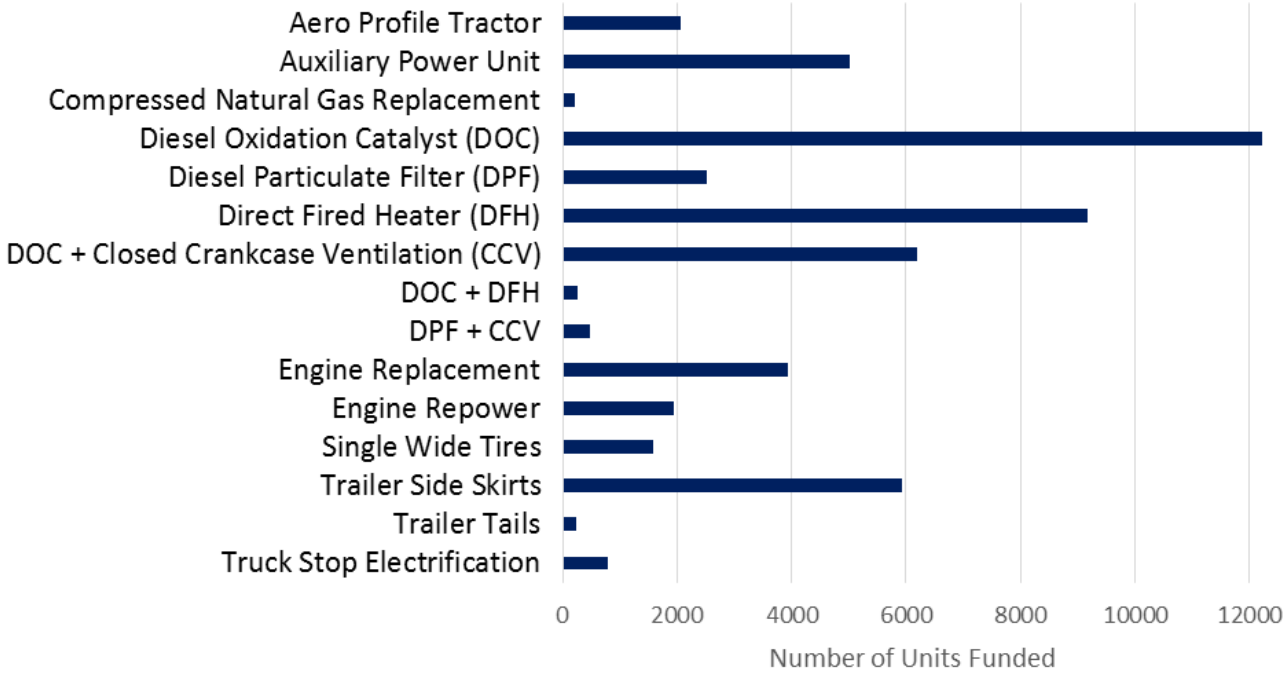
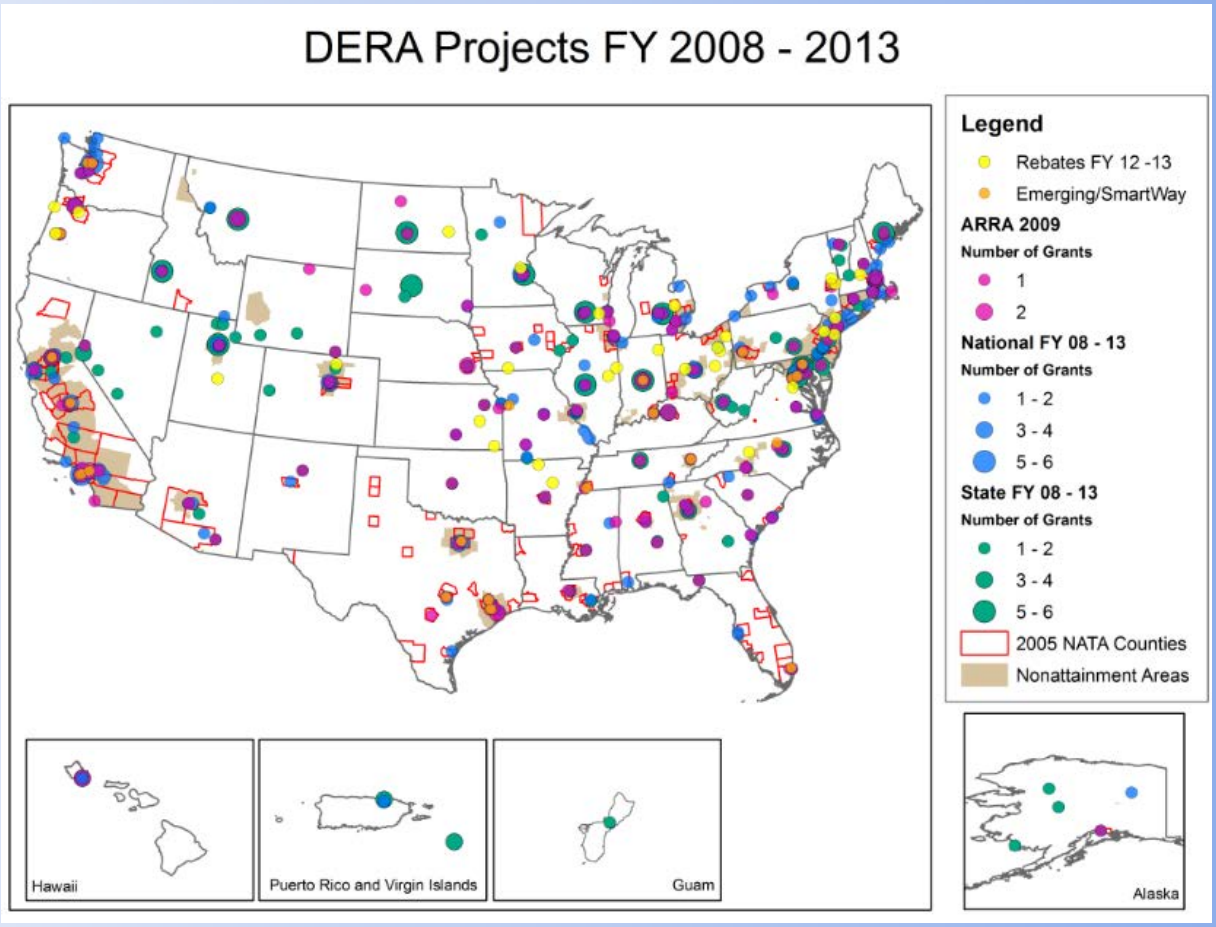


Exhibit 4: Cumulative Impacts of DERA (FY 2008-2013)

EPA has awarded 642 grants since the start of DERA in 2008 through FY 2013. These grants have upgraded nearly 73,000 vehicles or pieces of equipment and saved over 450 million gallons of fuel. EPA estimates that total lifetime emission reductions achieved through DERA funding are 14,700 tons of PM and 335,200 tons of NO_X. These reductions have created up to $12.6 billion of health benefits.[7]



Leading the Effort for Fleet Turnover

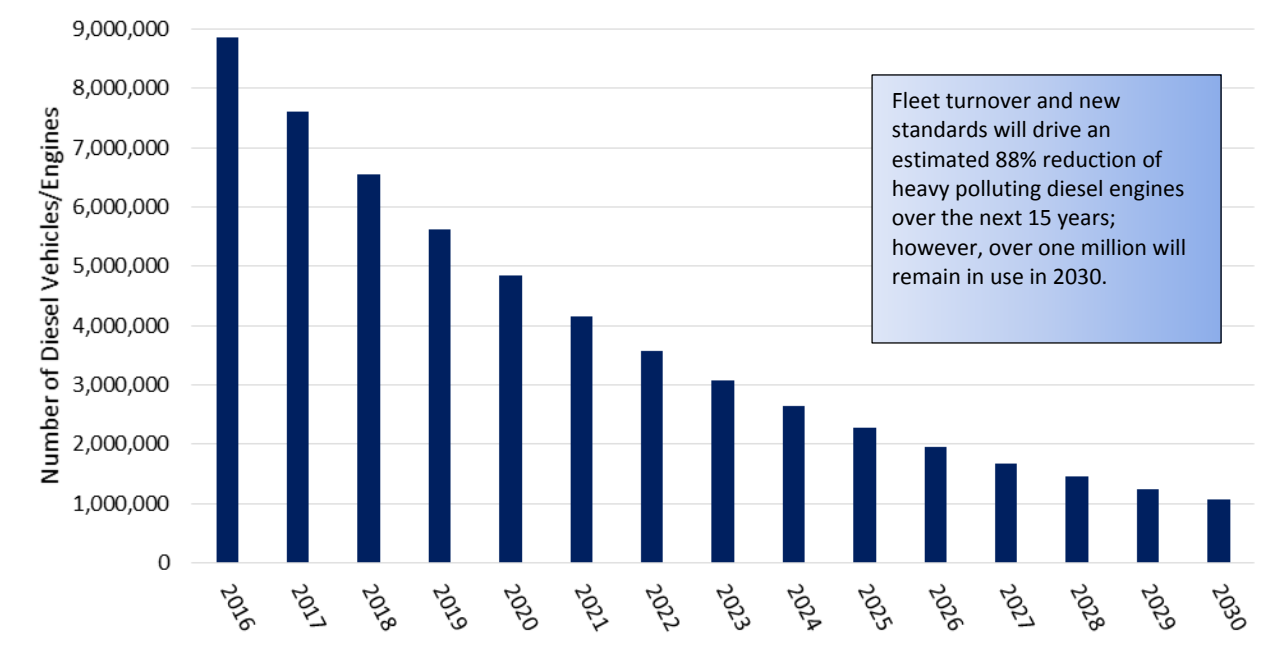
DERA funding has upgraded nearly 73,000 diesel engines since 2008, but many engines in the legacy fleet will continue to operate over the next decade. Although the number of heavy polluting diesel engines is projected to decline due to fleet turnover and new engine standards, a significant number of legacy vehicles will remain on the road. For instance, EPA estimates that more than one million legacy fleet engines will remain in operation in 2030, see Exhibit 5. [8]

DERA funding provides an incentive to fleet owners to upgrade or replace older equipment and accelerate the fleet turnover across the country. The replaced vehicles or engines are required to be scrapped or permanently disabled ensuring

the turnover of older, dirtier engines. Since 2008, demand from fleet owners has exceeded DERA's available funds. There is a need to turn over these older engines, a desire from fleet owners to do so, and a significant public health benefit.

DERA funding is a key component of EPA's National Clean Diesel Campaign (NCDC) which addresses the legacy fleet through outreach, partnerships, technology assessment and grants. It is the Federal program uniquely focused on protecting public health through lowering diesel exhaust exposure. Several other Federal programs include a clean diesel component, such as the Department of Transportation's Congestion Mitigation and Air Quality Improvement (CMAQ) Program, the U.S. Maritime Administration's grant program and the Department of Energy's Clean Cities program. CMAQ focuses on surface transportation projects that can contribute to congestion relief and air quality improvements, MARAD focuses on marine projects, and Clean Cities advances the nation's economic, environmental, and energy security by supporting local actions to cut petroleum use in transportation.

Exhibit 5: Diesel Engine Turnover by Year



Focus on Cost-Effective Projects

As part of its implementation role, over the years EPA has refined the requirements in the DERA Requests for Proposals (RFP) to lower the amount of EPA funding for individual projects where the vehicle or fleet owner derives an economic benefit (a more efficient engine or vehicle replacement, or fuel-saving technologies). In FY 2011 and earlier, EPA funded up to 75% of the cost of an engine repower. In FY 2012 RFP, EPA cost-share was lowered to 50% and by FY 2013 it was decreased to 40%. Additionally, EPA stopped funding stand-alone cleaner fuel use, though DERA grant recipients were permitted to bundle cleaner fuels with retrofit technologies or engine replacements. EPA also ceased funding stand-alone idle reduction technologies, except on locomotives, shore power systems, truck stop electrification or newer school buses already equipped with retrofit devices, unless the technologies were bundled with verified exhaust control technologies.

Focus on Communities and Improving Areas of Poor Air Quality

In the early years of DERA funding, many projects retrofitted long-haul trucks and fleets for immediate emissions reductions. Now, many of these trucks and buses are already equipped with emission reducing technologies due to EPA's emission standards for new heavy-duty engines, so project focus has shifted to older nonroad engines, vessels and short haul trucks. These engines can remain in service for decades and may predate EPA's most recent heavy-duty and nonroad emission standards, which have created significant reductions in PM and NO_X. These projects, though sometimes requiring more resources per engine than retrofitting trucks or buses, provide important reductions in emissions to local areas.

Community-based projects are those in or near specific locations like ports, rail yards, or bus depots where residents are disproportionately affected by diesel exhaust. Since the first DERA grants in 2008, EPA has increasingly focused attention on PM (per the 1997, 2006 and 2012 National Ambient Air Quality Standards) and ozone (per the 8-hour 2008 National Ambient Air Quality Standard) nonattainment areas. Between FY 2009 and FY 2013, 81% of all projects took place in nonattainment and areas with relatively high concentration of particulate matter.[9] In order to help reduce instances of asthma, heart and lung disease, and other respiratory ailments, EPA will continue funding projects in areas with air quality challenges to achieve the most meaningful improvements to the health and well-being of local residents.

Streamlined Funding Mechanism: The National Clean Diesel Rebate Program

The DERA reauthorization signed by President Barack Obama in 2011 allowed EPA to offer rebates in addition to grants. EPA opened the first rebate program in 2012 to allow public and private fleet owners to replace older school buses currently in operation. EPA had $2 million in total funding but received over

1,000 applications requesting more than $70 million. A lottery was used to make selections and applicants replaced 76 buses across the country. EPA offered a second round of rebate funding in 2013 to replace and retrofit construction equipment and provided rebates to three recipients. Outreach to the multi-segmented construction sector about the rebate opportunity proved difficult, and may have impacted participation in the program, along with EPA's limited ability to provide rebates to private fleets and relatively complex requirements necessary to achieve the most cost-effective results.

Rebates have proven to be a popular funding mechanism for both public and private school bus fleet owners. The benefits of the rebate program include a streamlined application process and an accelerated project period length. The time from start to finish for a rebate project is approximately half the time of a grant project. EPA offered another school bus replacement rebate program in 2014, the final results of which will be covered in the next Report to Congress.

Clean Diesel Projects at Ports

From the outset of the DERA program, the port sector has been a priority since communities surrounding ports tend to have disproportionately poor air quality. In 2013, EPA reinvigorated engagement with stakeholders about air quality issues facing ports. These conversations culminated in a Summit in Baltimore that brought together port authorities, state and local government, industry, and communities to discuss efforts to reduce emissions in ports. In FY 2013, EPA offered a ports-only Request for Proposals (RFP) to establish clean diesel projects at ports. EPA provided $4 million in funding for six grants to replace or retrofit more than 130 engines operating at or around ports.

Looking Ahead

As part of the President's *21st Century Clean Transportation Plan*, the Administration is calling for major new investments in our nation's infrastructure, by accelerating the integration of autonomous vehicles, low-carbon technologies, and intelligent transportation systems that reduce climate emissions, increase safety, and improve transportation options for American families. EPA will play its part in this plan, financed through the establishment of a mandatory fund that will accelerate the transition to cleaner vehicle fleets by providing $1.65 billion over the course of 10 years and up to $300 million in FY 2017 to renew and increase funding for the DERA Program.

EPA will also continue to target its traditional discretionary funding for areas that suffer from poor air quality and will focus on projects that engage local communities and provide lasting benefits. EPA is especially interested in working with port communities and has adjusted its national RFP to prioritize projects

that reduce emissions from engines involved in goods movements and freight industries. EPA also plans to continue to offer rebate funding and focus on fleet turnover for engines that pre-date EPA's on-highway standards for PM (model year 2006 or older).

Exhibit 6: Diesel Exhaust Health Effects

Direct emissions from diesel engines, especially PM, NO_X, and sulfur oxides (SO_X), as well as other air toxics, contribute to health problems. In addition, NO_X contributes to the formation of ozone and PM through chemical reactions.

PM has been associated with an increased risk of premature mortality, increased hospital admissions for heart and lung disease, and increased respiratory symptoms. Long-term exposure to components of diesel exhaust, including diesel PM and diesel exhaust organic gases, are likely to pose a lung cancer hazard. Exposure to ozone can aggravate asthma and other respiratory symptoms, resulting in more asthma attacks, additional medication, lost school and work days, increased emergency room visits and hospitalizations, and even premature mortality. Repeated exposure to ozone can increase susceptibility to respiratory infection and lung inflammation and can aggravate preexisting asthma. At sufficient concentrations, ozone can even cause permanent damage to the lungs, resulting in the development of chronic respiratory illnesses. Children, outdoor workers, those who exercise outside, people with heart and lung disease, and the elderly are most at risk.

The technologies used in DERA grants can reduce PM emissions by up to 95% and NO_X by up to 90%. Each of these reductions makes an immediate and positive impact on public health. PM and NO_X controls have been the primary focus for the time period of this Report.

For more information on health effects, see *Health Assessment Document for Diesel Engine Exhaust*, which examines information regarding the health hazards associated with exposure to diesel engine exhaust.

[1] EPA's Office of Transportation and Air Quality calculation using MOVES2014 and NONROAD.

[2] For FY 2011, the State Clean Diesel Program results are actuals and the National Clean Diesel Program results are estimates. For more detailed final information on the FY 2008 grants, please see the *Second Report to Congress: Highlights of the Diesel Emissions Reduction Program*, EPA 420-R-12-031 from December 2012.

See the *Report to Congress: Highlights of the Diesel Emissions Reduction Program*, EPA 420-R-09-006 from August 2009 for the First Report on the DERA program.

[3] PM2.5 will be referred to as PM for the rest of this Report.

[4] When a grant is awarded, estimated emissions reductions are calculated. As the grant progresses, DERA grant recipients are required to submit quarterly programmatic progress reports to EPA. Once a grant is completed, the recipient submits a final programmatic report which includes an overview of the project's implementation and a final accounting of project expenses and results (engines replaced or retrofitted, technologies applied, and emissions reduction calculations for PM, NOx and CO2). EPA, along with a contracted third party, evaluates the reports for consistency and accuracy.

EPA estimates emissions reductions for each project through our web-based Diesel Emissions Quantifier (DEQ) using the information in the grant final reports. The DEQ uses MOVES and NONROAD as the basis for calculations. After the emissions reductions are calculated, the information is tracked internally along with all grant recipient information. Final emissions data for each grant is totaled for each fiscal year and program.

EPA estimates that the total present value of health benefits from the emission reductions between the Recovery Act and FY 2013 range from $3.0 billion to $11 billion (in 2014 dollars; range reflects the use of both a 3 and 7 percent discount rate and the valuation of premature mortality derived from either the American Cancer Society cohort study (Krewski et al., 2009) or the Harvard Six-Cities study (Lepeule et al., 2012)). Benefits calculated using EPA's PM2.5 benefit per ton values, which monetize a suite of PM-related health impacts including premature mortality, hospital admissions, emergency room visits, and work loss days. Please refer to the benefit per ton Technical Support Document for more information. US EPA, (2013). Technical Support Document: Estimating the Benefit per Ton of Reducing PM2.5 Precursors from 17 Sectors. Office of Air Quality Planning and Standards. Research Triangle Park. January. The document can be found here: www.epa.gov/sites/production/files/2014-10/documents/sourceapportionmentbpttsd.pdf (accessed 7/24/2015).

[5] EPA estimates that the emission reductions achieved over the lifetime of the affected engines will help avoid between 750 and 1,700 premature deaths. Estimates of premature mortality avoided were calculated using PM-related incidence per ton estimates presented in the benefit per ton Technical Support Document (referenced above). The range of premature mortality avoided is derived from either the American Cancer Society cohort study (Krewski et al., 2009) or the Harvard Six-Cities study (Lepeule et al., 2012).

[6] Many grant recipients installed more than one technology on each vehicle, so the total number of technologies exceeds the 58,815 vehicles affected figure stated above.

[7] The cumulative totals were created by adding the actual results from FY 2008 from the Second Report to Congress to the actual and estimated results covered in this Report from the Recovery Act to FY 2013.

[8] The "Legacy Fleet" is defined by the DERA program as the existing pool of medium and heavy - heavy-duty engines in 2008, the first year of appropriations for DERA, or approximately 11 million diesel engines. This estimate was created according to the MOVES and NONROAD models. Data based on a projected 10 percent fleet turnover rate from EPA modeling.

[9] The percentage of projects taking place in FY 2009-2013 in non-attainment areas was calculated using the EPA Office of Air and Radiation's most recent National Ambient Air Quality Standards, which can be found at www3.epa.gov/ttn/naaqs/criteria.html and NATA areas are places where all or part of the population is exposed to more than 2.0 µg/m3 of diesel particulate matter emissions in EPA's 2005 National-Scale Air Toxics Assessment found at: www3.epa.gov/ttn/naaqs/criteria.html.

Section 1: DERA National Competitive Grants

EPA prioritizes clean diesel projects that provide immediate health and environmental benefits and target areas of greatest need. The DERA legislation emphasizes maximizing health benefits and serving areas of poor air quality, such as non-attainment areas for PM and ozone, and conserving diesel fuel.

For each fiscal year, by statute, EPA sets aside 30% of funding for states to establish their own clean diesel programs. The remaining 70% of the annual appropriation is used for national competitive grant and rebate funding opportunities. Some of those funds may be reserved for special funding opportunities, such as the National Clean Diesel Rebate program, but most is directed to a nationwide, competitive grant program.

Exhibit 7: Total DERA Funding Appropriations in this Report

Recovery Act	2009/2010	2011	2012	2013
$300 million	$120 million	$50 million	$30 million	$20 million

Fiscal Year 2009/2010

EPA received an appropriation of $60 million in both FY 2009 and FY 2010; of the combined total of $120 million, $64 million went to the national competitive program.[1] Combining the two years' appropriations streamlined the RFP process and provided applicants an opportunity to propose larger projects.

EPA received over 350 applications with applicants requesting five dollars for every one available. EPA awarded 69 national, competitive grants. These grants retrofitted or replaced 7,700 engines and pieces of equipment, see Exhibit 8 and Exhibit 9.

Exhibit 8: FY 2009/2010 DERA Funding by Sector

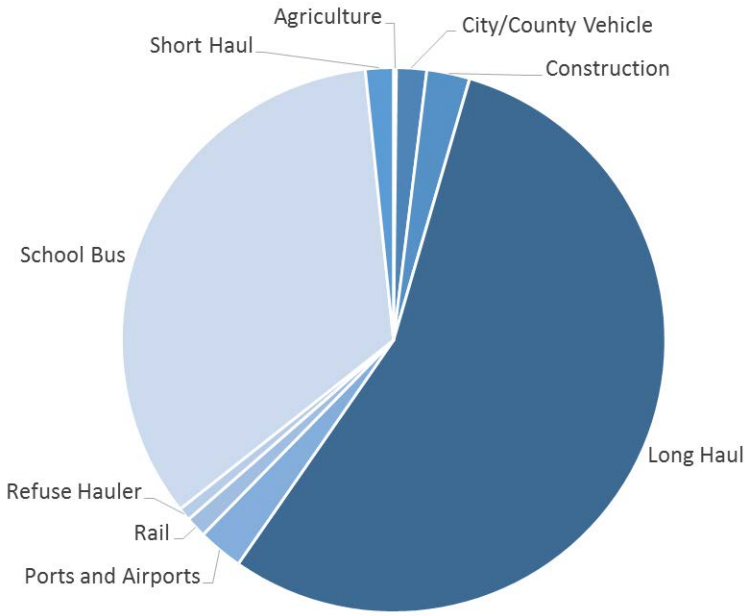
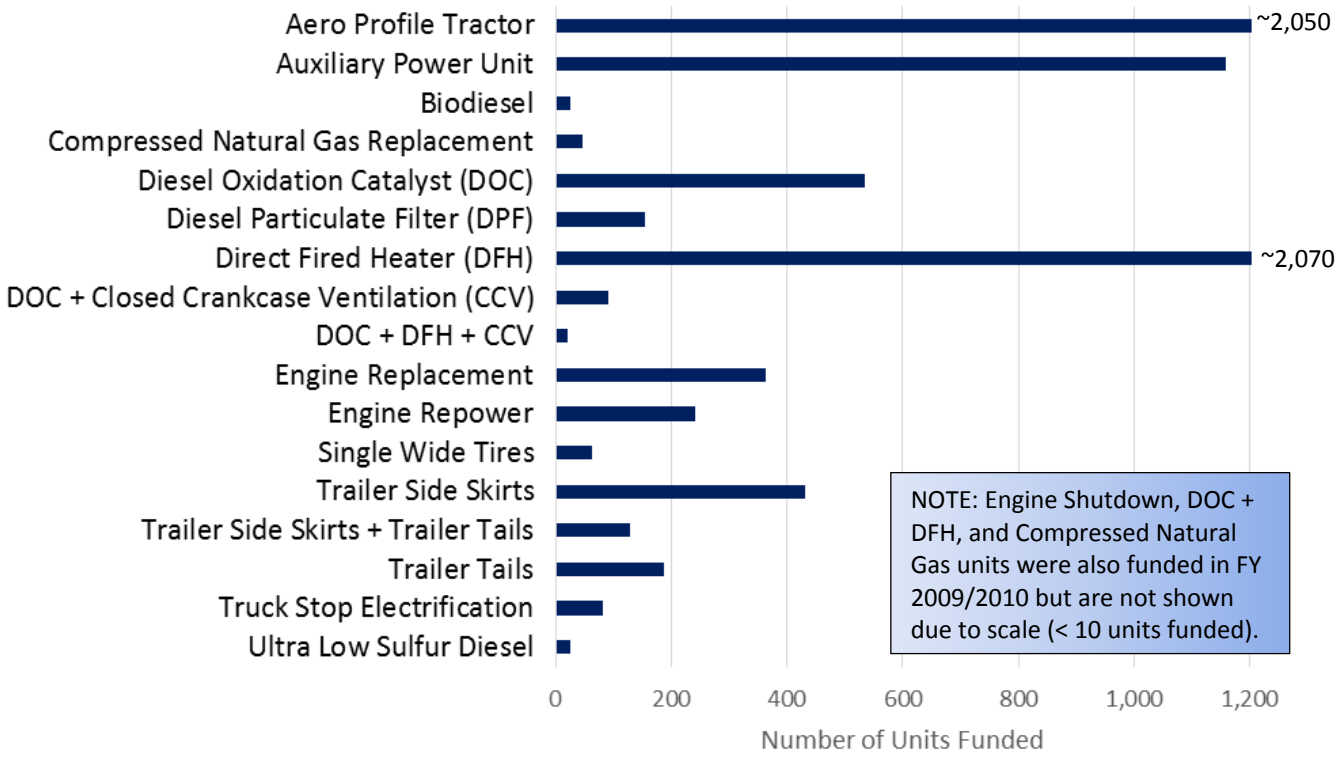


Exhibit 9: FY 2009/2010 DERA Technologies

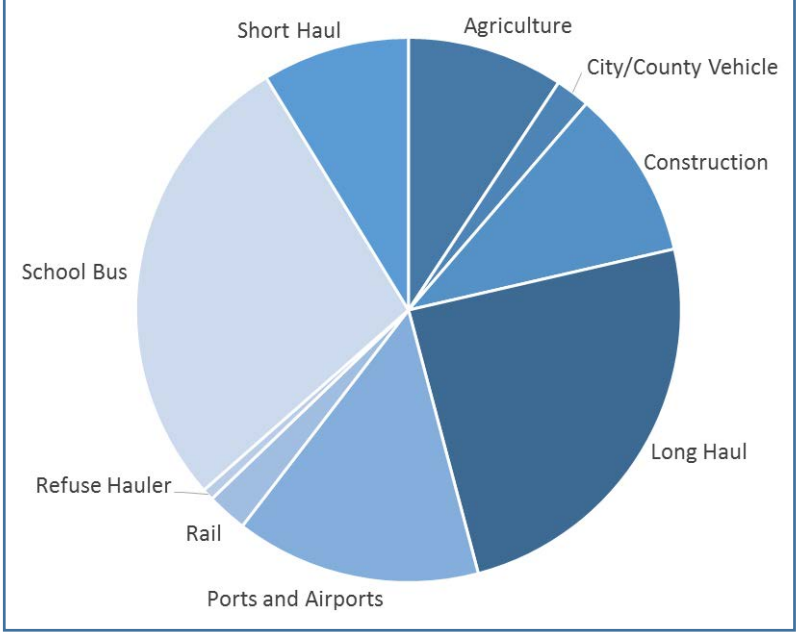


DERA FY 2009/2010 grants reduced an estimated 56,500 lifetime tons of NO_X; 1,700 tons of PM; 2,800 tons of HC; 7,800 tons of CO; and 882,900 tons of CO_2. These projects also saved over 78 million gallons of fuel.

Fiscal Year 2011

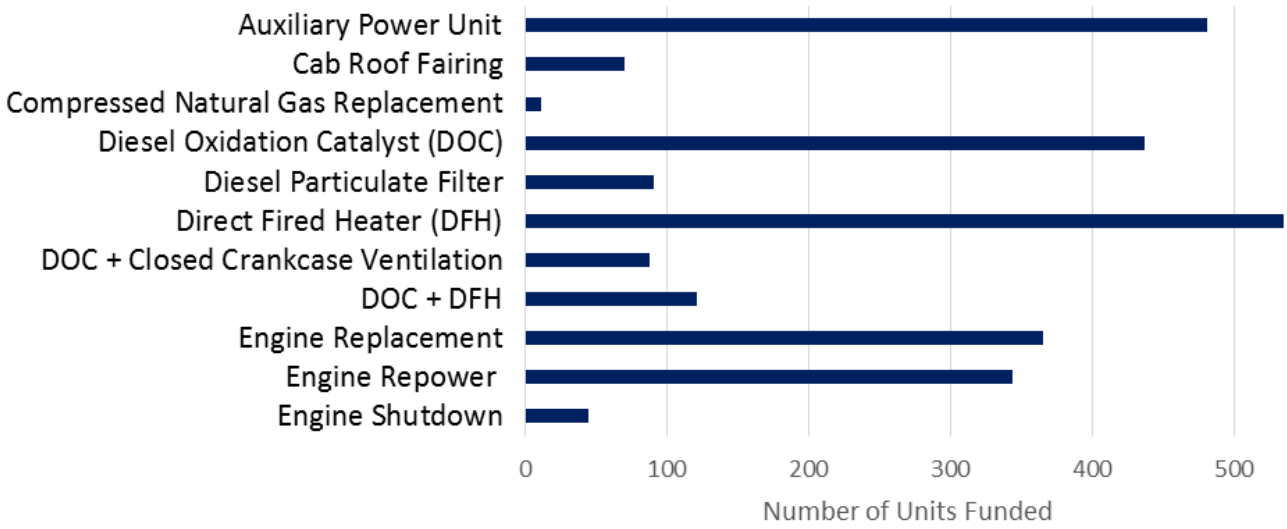
EPA received a $50 million appropriation in FY 2011 and directed $32 million to the national competitive program. EPA funded 47 national competitive grants across the country, one of which was an Emerging Technology grant. Matching funding contributed was $38 million. EPA received 235 applications requesting $289 million, see Exhibit 10 and Exhibit 11.

Exhibit 10: FY 2011 DERA Funding by Sector



DERA FY 2011 grants are estimated to reduce 37,800 lifetime tons of NO_X; 1,400 tons of PM; 2,600 tons of HC; 7,000 tons of CO; and 263,300 tons of CO_2. These grants upgraded 2,600 engines or pieces of equipment, and the projects saved more than 23 million gallons of fuel.

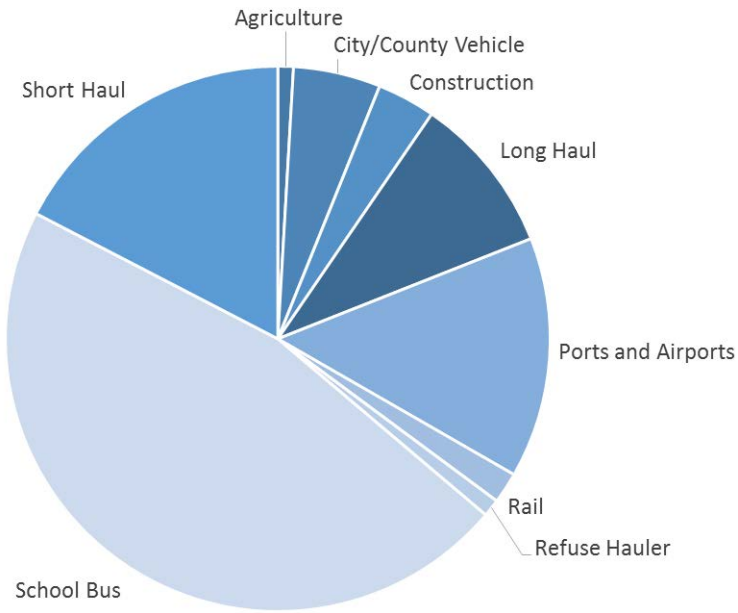
Exhibit 11: FY 2011 DERA Technologies



Fiscal Year 2012

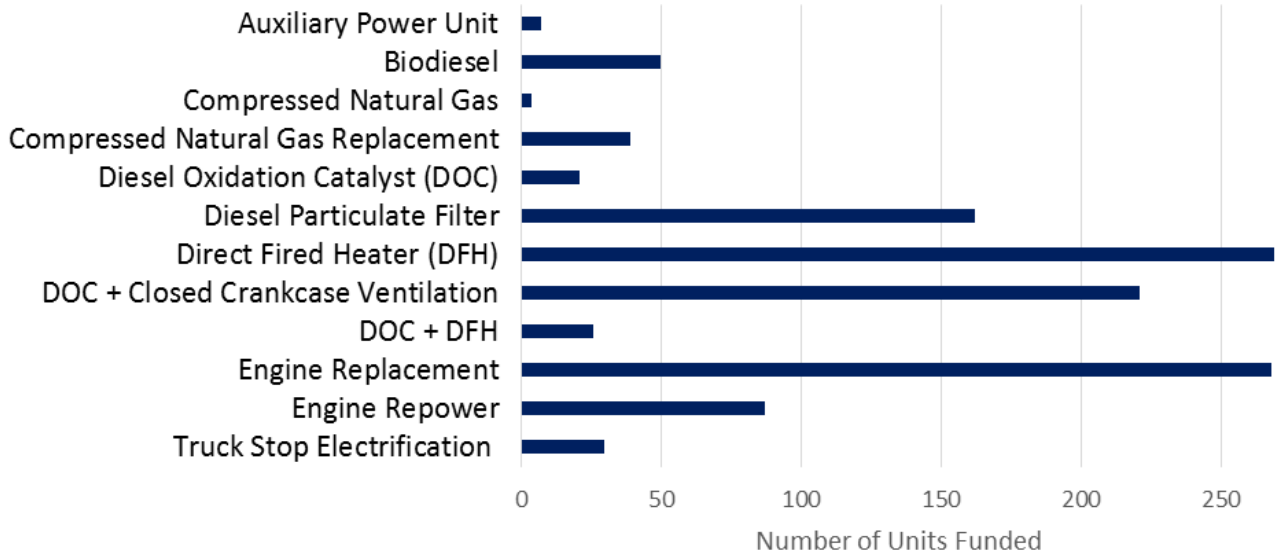
In FY 2012, EPA received $30 million for clean diesel projects. EPA allocated approximately $20 million for the national competitive program and funded 26 grants to reduce emissions from 868 diesel engines or pieces of equipment. Matching funding contributed was $39 million. EPA received 94 applications seeking nearly $132 million in funding, see Exhibit 12 and Exhibit 13.

Exhibit 12: FY 2012 DERA Funding by Sector



DERA FY 2012 grants are estimated to reduce 26,600 lifetime tons of NO_X; 800 tons of PM; 1,100 tons of HC; 3,500 tons of CO; and 100,700 tons of CO_2. These projects also saved nearly 9 million gallons of fuel.

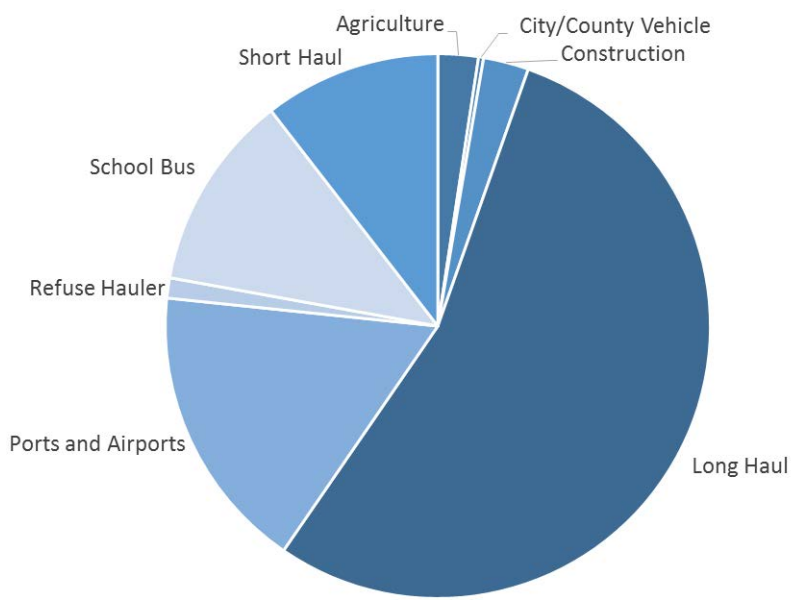
Exhibit 13: FY 2012 DERA Technologies



Fiscal Year 2013

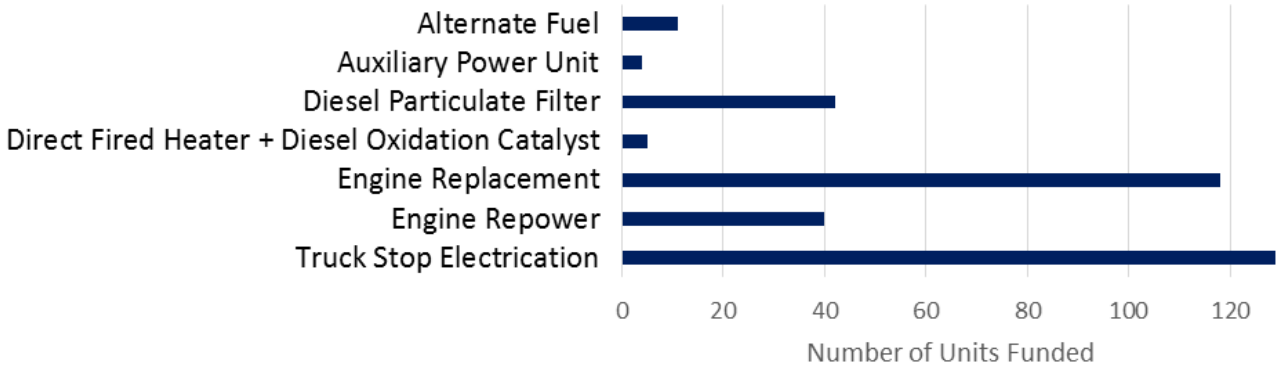
In FY 2013, EPA received a total appropriation of $20 million and dedicated $14 million for the rebate program, the ports-specific RFP, and the national RFP. EPA made $9 million available under the FY 2013 National Clean Diesel Funding Assistance Program and received 78 applications seeking almost $48 million in funding. EPA funded 23 competitive grants in FY 2013. Matching funding contributed was $23 million. These grants retrofitted, replaced or repowered 334 engines and pieces of equipment, see Exhibit 14 and Exhibit 15.

Exhibit 14: FY 2013 DERA Funding by Sector



EPA estimates that DERA FY 2013 grants reduced 6,900 lifetime tons of NO_X; 170 tons of PM; 100 tons of HC; 1,100 tons of CO; and 91,200 tons of CO_2. These projects also saved more than 8 million gallons of fuel.

Exhibit 15: FY 2013 DERA Technologies



Lessons Learned and Looking Ahead

EPA continues to target DERA funds to maximize cost-effectiveness and make significant emissions reductions in areas disproportionately exposed to diesel exhaust. In 2012, EPA conducted an evaluation and planning process to target those engines in the remaining fleet that have significant useful life left but are heavy emitters. These engines are often found at ports and are used for goods movement. Each funding opportunity since has been crafted to attract and fund the most impactful projects, often in the goods movement sector.

For the national competitive program, demand from applicants has exceeded program resources. For the past two fiscal years, over 1000 engines were not able to be funded from the following types of fleets: transit buses, short haul/delivery trucks, refuse haulers, locomotives, agriculture, construction, city/county vehicles, school buses, marine, ports and airports, and long haul trucks.

DERA SmartWay Finance Grants

The SmartWay Finance program competitively awarded grants to establish programs to provide fleet owners access to financing through the use of low-cost loans and loan guarantees for the purchase of fuel-saving and emission control technologies and vehicle replacements. SmartWay Finance grants established programs that assisted small- and medium-sized fleet owners in purchasing cleaner, more fuel-efficient trucks and equipment.

EPA awarded four grants in FY 2009/2010 and five in the Recovery Act with more than $22.5 million to replace or retrofit more than 1,400 engines or pieces of

equipment. In total, EPA had selected nine projects in FY 2009/2010 and Recovery Act, but three projects returned funds and were closed before they achieved results. The FY 2009/2010 and Recovery Act Finance Grants reduced an estimated 19,200 lifetime tons of NO_x; 600 tons of PM; 1,000 tons of HC; 5,600 tons of CO; and 82,900 tons of CO_2. These grants will save over 7 million gallons of fuel.

Lessons Learned

Grants to set up financing programs have proven to be a difficult mechanism to fund clean diesel projects. Finance grants generally require more administrative oversight and more time to establish and accomplish grant objectives, due to the revolving nature of loan programs. In addition, some grantees could not make the envisioned program work. Issues included changing economic factors (lower interest rates which made the grantee's program less appealing; lower demand for new engines or technologies due to the slowed economy; expiration of a tax credit necessary for the program to succeed) and grantee administrative challenges. EPA deobligated $18.9 million in funding for these grants and returned it to either the U.S. Treasury (Recovery Act grants) or redirected the funds to other clean diesel DERA grants. EPA has closed all finance grants awarded from 2008 to 2010. Because DERA grants have not proven to be a good mechanism for establishing and administering low-cost financing programs, EPA is not currently anticipating loan future programs.

Exhibit 16: Reducing Emissions on School Buses through Retrofits[2]

Nearly 13,000 Diesel Oxidation Catalysts (DOC) or DOC + Closed Crankcase Ventilation (CCV) have been installed on school buses with DERA funding, as well as approximately 1,400 Diesel Particulate Filters (DPF). In 2014, EPA's Technology and Assessment Center within the Office of Transportation and Air Quality conducted in-use testing on DOCs and DPFs and confirmed these technologies achieve verified levels of emissions reduction and remain durable in real world applications. Between 2008 and 2012, multiple manufacturers' verified retrofit devices were procured by EPA and tested.

The devices were typically from prior grant projects and were used on school buses in normal operation for two to four years and accumulating up to 90,000 miles. All testing was performed on an engine dynamometer. Nine DPFs and three DOCS were tested for PM, HC, and CO. Per the tables on the right, DOCs alone were shown to reduce PM emissions up to 20%, and DPFs can reduce PM up to 99%.

DOC Emissions Reduction		
PM	HC	CO
20%	76%	63%
16%	81%	66%
20%	70%	37%

DPF Emissions Reduction		
PM	HC	CO
94%	37%	N/A
64%	57%	55%
65%	72%	61%
51%	51%	53%
82%	74%	65%
99%	86%	73%
97%	92%	77%
98%	86%	77%
97%	87%	73%

DERA Emerging Technology Grants

The Emerging Technology (ET) program fostered the development of next generation diesel emissions reduction technologies by partnering technology manufacturers with fleets to test the effectiveness of the products. If the products proved successful in the field, they became verified technologies and available for wider use. The program supported projects to demonstrate and improve seventeen technologies.

In total, EPA provided over $15 million in funding for emerging technology grants to upgrade more than 200 engines or pieces of equipment while also supporting technology innovation. In FY 2009/2010, EPA awarded funding to five ET projects. Eleven projects were selected to receive Recovery Act funding. In FY 2011, EPA funded one ET project.

Emerging technologies included selective catalytic reduction, diesel oxidation catalysts, engine shutdown, engine upgrades, auxiliary power units, diesel particulate filters, exhaust gas recirculation, a lean NOx catalyst, and hybrid replacements. The ET grants reduced an estimated 4,400 lifetime tons of NOx; 160 tons of PM; 220 tons of HC; 1,600 tons of CO; and 2,200 tons of CO_2.

Lessons Learned

While the ET program was successful in demonstrating some new products, there were many challenges for manufacturers and fleets with the limited DERA funding available. Consequently, EPA suspended the ET program as DERA allocations decreased. At the same time, the DERA program prioritized funding to areas with poor air quality given limited funding. Complexities associated with emerging technologies and their grant projects also made them more costly for the numbers of devices installed. Of the emerging technologies included on the ET program list, over half elected to not pursue full EPA verification or certification.

DERA Tribal Grants

A priority for the DERA program is to work with Tribes to reduce emissions. EPA began funding Tribal grants through the national competitive program in FY 2009/2010. Between FY 2009-2013, EPA received applications requesting nearly $7 million in funding. By FY 2013, EPA had awarded ten tribal grants in Alaska, Arizona, California, Iowa, Minnesota, and Washington. These grants have provided $3,204,660 to retrofit or replace marine vessels, mining equipment, generators, municipal vehicles, and school buses.

Lessons Learned and Looking Ahead

Taking into consideration Tribal feedback, EPA offered a stand-alone tribal RFP in FY 2014 with $1 million in available funding. EPA is committed to strengthening partnerships with tribal communities and will likely continue to offer a stand-alone RFP for tribes with targeted tribal outreach.

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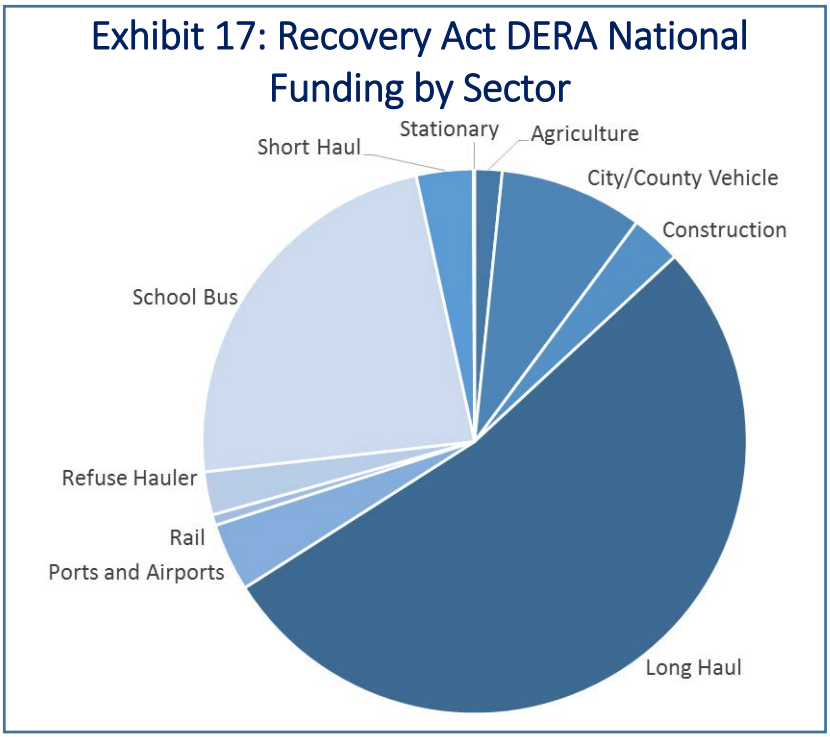
[1] The state program automatically receives 30% of an appropriation, so the national component received 70% of the 2009/2010 program, which amounted to $84 million. The national competitive program received $64 million while the remaining $20 million went to the Emerging Technology and SmartWay Finance grant programs. In addition, some national funding in FY 2011 and the Recovery Act went to SmartWay Finance and Emerging Technology grants. These results are covered in another section.

[2] McCoy, B. J., & Tanman, A. (2014). Emissions Performance and In-Use Durability of Retrofit After-Treatment Technologies. *SAE International Journal of Engines,* 7(4). DOI: 10.4271/2014-01-2347.

Photo Courtesy of Northwest Indian Fisheries Commission

Section 2: American Recovery and Reinvestment Act

In 2009, EPA received $300 million for DERA through the American Recovery and Reinvestment Act (Recovery Act), see Exhibit 17 and Exhibit 18.[1] EPA funded "shovel-ready" large and impactful clean diesel projects that delivered immediate emissions reductions. More than 600 entities applied, requesting $1.7 billion in project funds and offering $2.2 billion in matching funds. EPA awarded 89 competitive projects across the country, upgrading nearly 17,000 pieces of equipment, see Exhibit 17 and Exhibit 18.[2]



DERA Recovery Act grants are estimated to reduce 102,500 lifetime tons of NO_X; 3,600 tons of PM; 6,000 tons of HC; 17,000 tons of CO; and 2,235,700 tons of CO_2. These projects also saved nearly 200 million gallons of fuel. Grant recipients reported to the Office of Management and Budget that these projects created or saved approximately 3,000 jobs.[3]

Photo courtesy of Michael Kearns, City of Richmond, VA

Photo courtesy of Mat Carlile, Utah Department of Environmental Quality

Photo courtesy of the San Joaquin Valley Unified Air Pollution Control District

Exhibit 18: Recovery Act DERA National Technologies

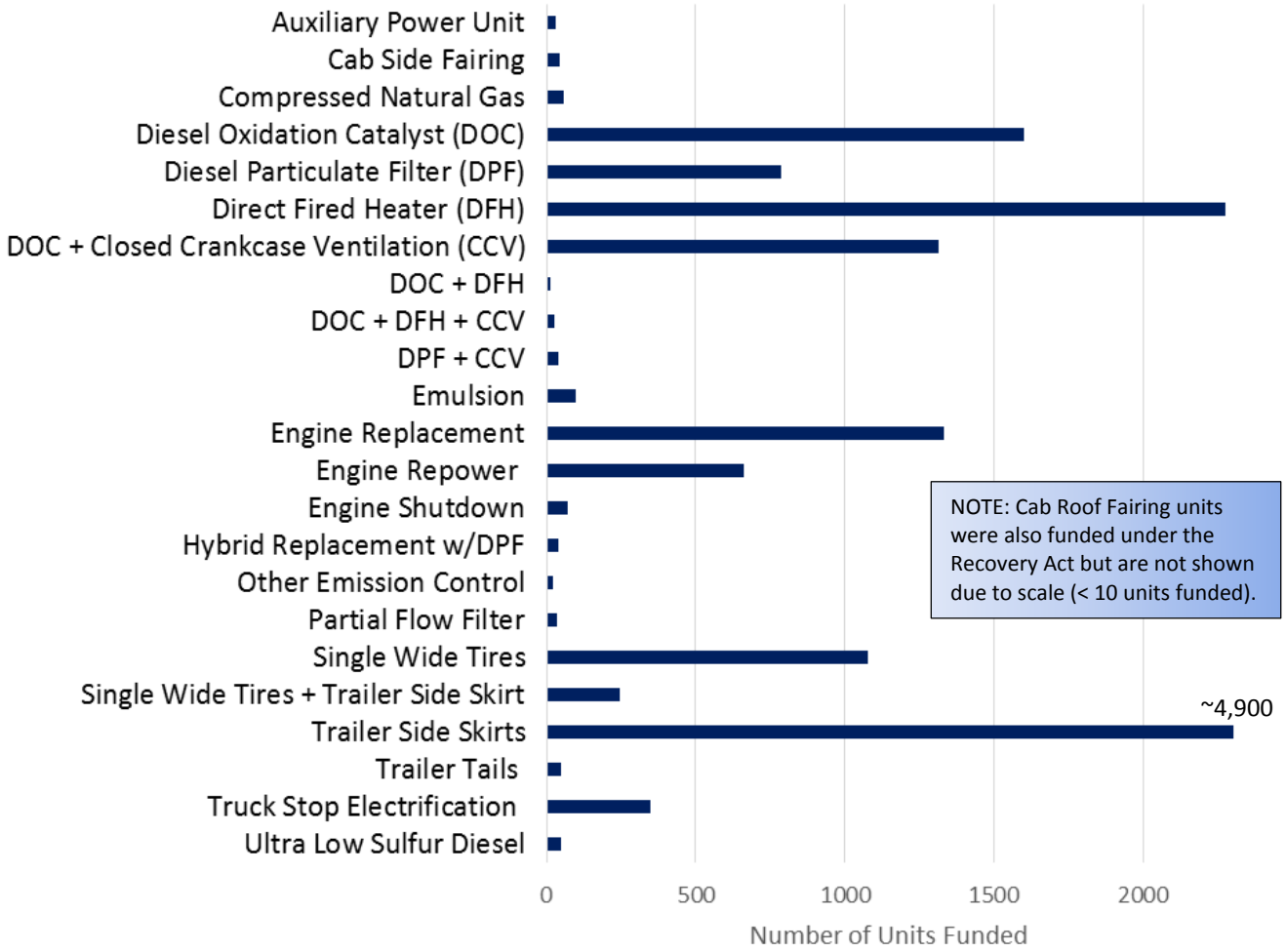


Photo courtesy of City of Portland Bureau of Planning and Sustainability

Recovery Act State grants

As part of the Recovery Act, EPA funded state grants as well as national competitive DERA grants. EPA allocated $88 million to participating states to retrofit or replace 13,700 engines or pieces of equipment. These projects reduced an estimated 22,600 lifetime tons of NO_X; 1,400 tons of PM; 1,900 tons of HC; 7,900 tons of CO; and 538,600 tons of CO_2. These projects also saved more than 48 million gallons of fuel, see Exhibit 19 and Exhibit 20.

Exhibit 19: Recovery Act DERA State Funding by Sector

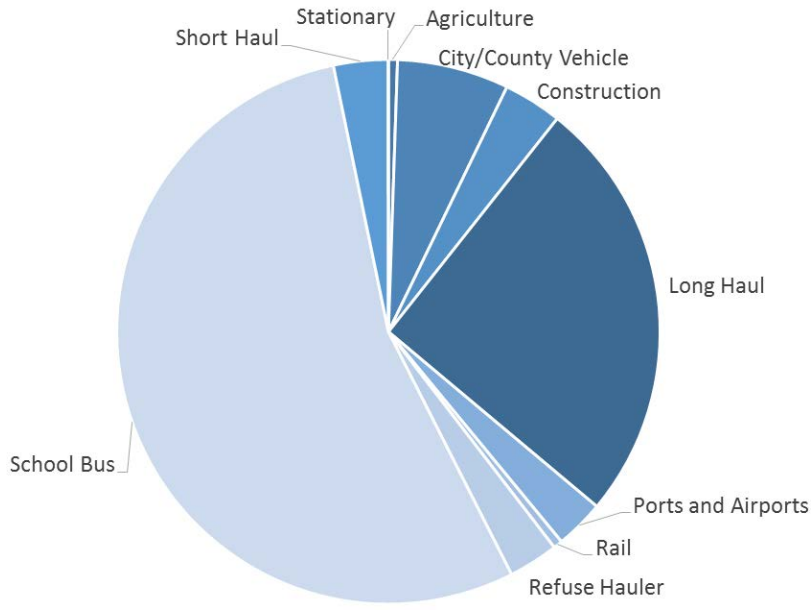
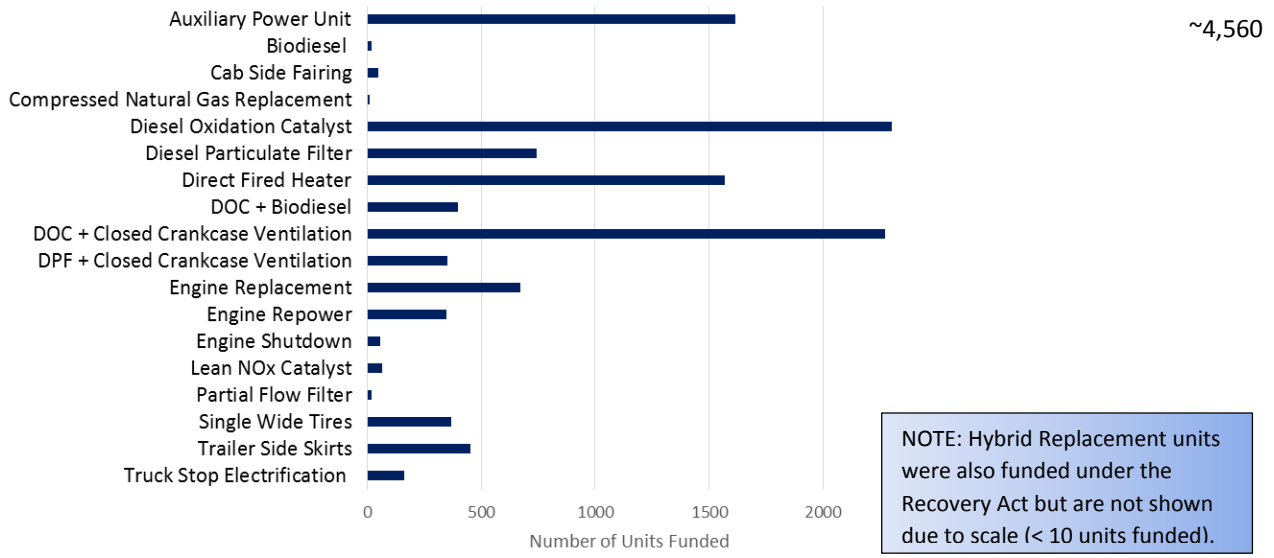


Exhibit 20: Recovery Act DERA State Technologies



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[1] Total funding for projects was $294 million due to management and oversight funds.

[2] Recovery Act funding also included SmartWay Finance, Emerging Technology, and State grants, all of which are covered in their own sections below.

[3] This jobs estimate was created based on self-reported information from Recovery Act grant recipients according to the Office of Management and Budget's guidance on job reporting.

Section 3: DERA State Program

Protecting Children's Health and Lowering PM2.5 Emissions in California

California Air Resources Board (CARB) was awarded a two-year DERA State Clean Diesel Program grant to install Diesel Particulate Filter (DPF) retrofits on 60 heavy-duty school buses operating throughout California. This project was implemented using $660,051 in DERA grant funding combined with $473,949 in CARB matching funds and $44,599 in leveraged funds from the San Joaquin Valley Air Pollution Control District (SJVAPCD) and participating school districts. This project was administered through a partnership between CARB, SJVAPCD and participating fleets. The project produced greater deployment of clean diesel technology than proposed in the original work plan (i.e., 60 installed versus 54 projected retrofits).

The DERA legislation requires EPA to offer 30% of the annual appropriation to states to implement their own clean diesel programs. The fifty states began receiving DERA funds in 2008, and the District of Columbia became eligible as a state in FY 2009. The state agencies receiving and administering the DERA funds do not directly implement projects; instead, the agencies run their own funding programs to offer sub-grants and loans to applicants within their states. State agencies must select eligible applicants according to EPA's requirements, but the selections are made entirely by the states to best fit state and local needs. Participating states received supplemental funds in 2009, 2010, and 2011 to their original FY 2008 awards. Supplemental funding to the original award allows for greater continuity for state projects.

Puerto Rico became eligible for state funding in FY 2011, and the DERA reauthorization allowed Guam, the United States Virgin Islands, American Samoa, and the Commonwealth of the Northern Mariana Islands to receive funds beginning in FY 2012. The five U.S. territories split funds equivalent to one state's funding allotment.

Diesel Oxidation Catalyst (DOC)

This old diesel engine from a waste hauler was scrapped and replaced with a CNG engine. Photo Courtesy of Leonardo Academy

FY 2008-2011 State Grants

In total, states and territories received about $54 million in FY 2008-2011 funds.[1] EPA made 55 initial awards, and these grants received supplemental funding in the subsequent fiscal years, see Exhibit 21 and Exhibit 22. These projects are estimated to reduce 19,300 lifetime tons of NO_X; 910 tons of PM; 1,300 tons of HC; 5,100 tons of CO; and 500,600 tons of CO_2.

Exhibit 21: FY 2008-2011 DERA State Funding by Sector

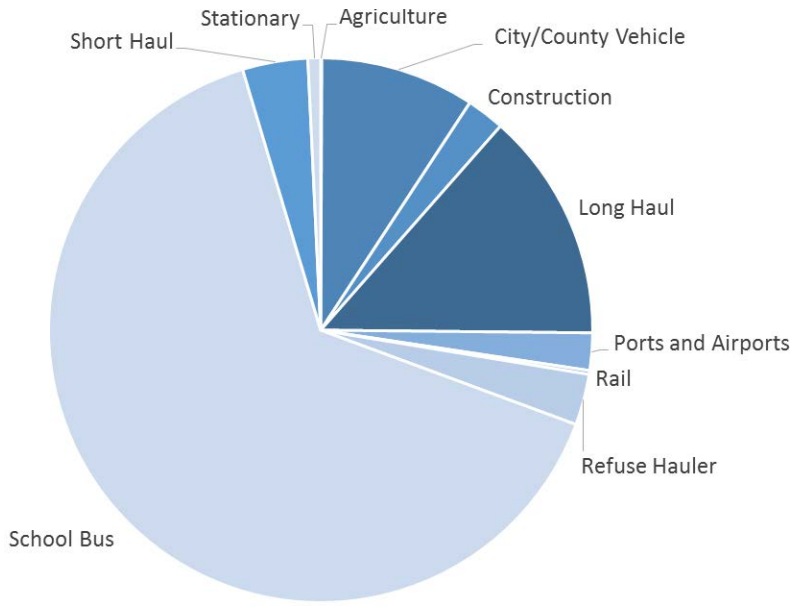
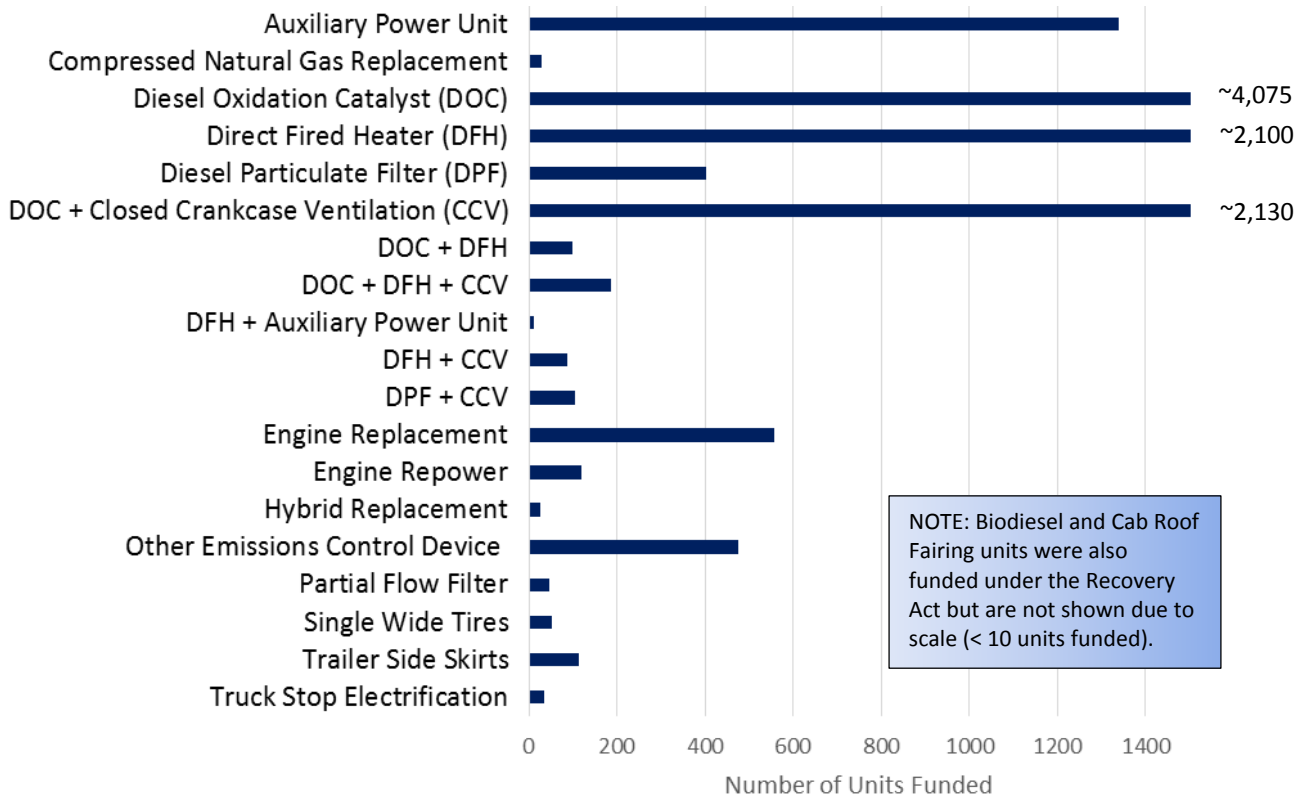


Exhibit 22: FY 2008-2011 DERA State Technologies



These projects also saved about 45 million gallons of fuel and retrofitted or replaced 12,000 engines or pieces of equipment.

FY 2012-2013 State grants

After finishing the FY 2008-2011 grants, EPA decided to reduce the amount of time state grants remain open in order to encourage states to draw down funding more quickly and to streamline the grant process. EPA switched to two year funding increments, so the next round of state grants began in FY 2012 and concluded with FY 2013 funding. In total, states and territories received about $9.5 million in FY 2012-2013 funds. EPA made 51 initial awards in FY 2012 and 29 supplemental awards in FY 2013, see Exhibit 23 and Exhibit 24.

Exhibit 23: FY 2012-2013 DERA State Funding by Sector

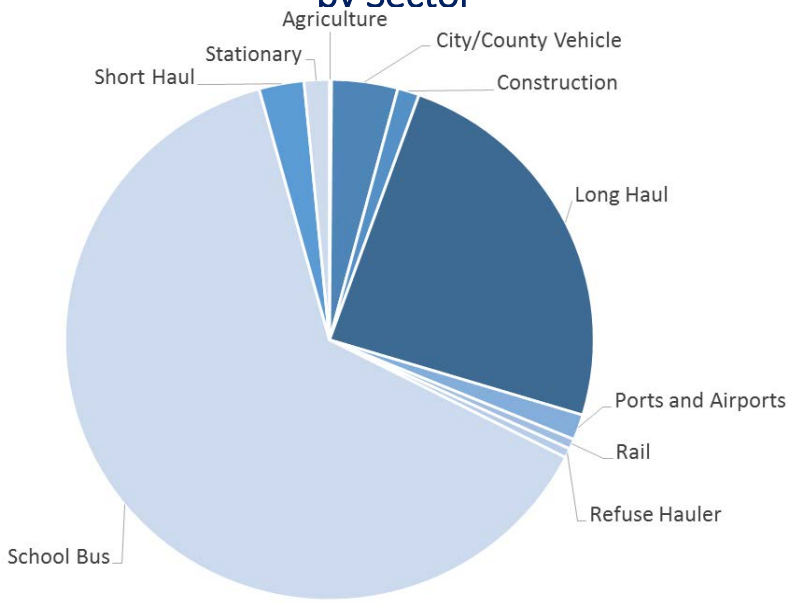
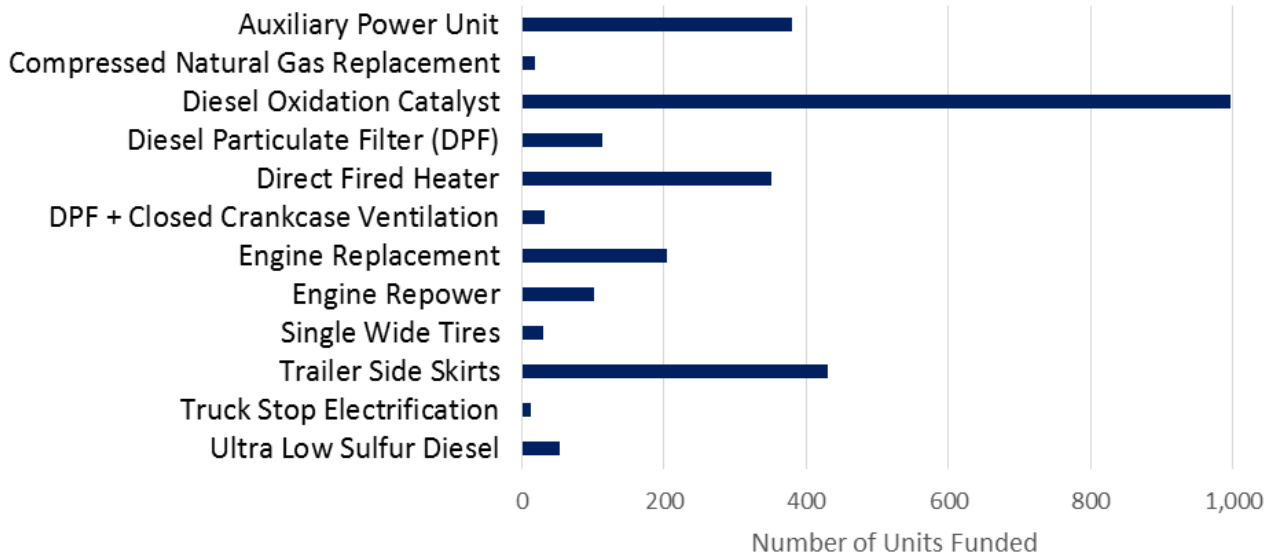


Exhibit 24: FY 2012-2013 DERA State Technologies



These projects reduced an estimated 4,500 lifetime tons of NO_X; 200 tons of PM; 240 tons of HC; 1,200 tons of CO; and 86,500 tons of CO_2. These projects also saved about 7.7 million gallons of fuel and retrofitted or replaced 1,900 engines or pieces of equipment.

Lessons Learned and Looking Ahead

After the conclusion of the FY 2012-2013 state grants, EPA began a new grant cycle for FY 2014-2015. Participating States began new grants if they had completed their work plan for FY 2013 grants. EPA conducted an analysis of the State grant program and found that State clean diesel projects could be more cost effective if they adhered to the DERA National program requirements. In 2014, EPA began requiring States to follow the requirements in the DERA National Program RFP for model years, technologies, cost-share and other factors. This proved difficult for some States, so some applied to EPA for and received waivers as they adjusted their programs to the more rigorous requirements.

[1] FY 2008 state grant results are covered in this Report to Congress because they were combined with later fiscal years to create one continuous project.

Section 4: DERA National Clean Diesel Rebate Program

A significant change in the DERA reauthorization signed in January 2011 provided EPA with the authority to award rebates. Rebates may be awarded to public institutions and some non- profit organizations, and private entities if they have a license, lease or contract with an eligible public organization. The National Clean Diesel Rebate Program was the first-ever rebate program within EPA.

Rebates and grants differ in a variety of ways. One distinction is the simplified application process for rebates, which applicants prefer, compared with the higher administrative burden of the grant process. Rebates specify exact project requirements and eligibility. This allows for a more streamlined application, selection, and payment process. The rebate amount is specified up front and, once the selected applicant has completed all work, they are reimbursed with the rebate amount. EPA chose to use a lottery system to select school bus rebate winners. Winners had to meet all program requirements.

The 2012 School Bus Replacement Rebate Program

School buses were selected as the target fleet for the pilot rebate program because protecting children's health is a very high priority for EPA, and NCDC has a long and successful history with the school bus sector on clean diesel projects.

In November 2012, EPA launched the 2012 School Bus Replacement Rebate Program, a pilot program to replace older school buses with newer vehicles powered by certified 2012 or newer engines. EPA set aside $2 million for this program, and each rebate award funded approximately 25% of the bus replacement; fleet owners covered the remaining cost. This funding opportunity was aimed at school bus fleet owners with 1994 to 2003 model year engines seeking to replace those buses with a certified 2012 or newer model year engine. Eligible replacement school buses may operate on ultra-low sulfur diesel, battery or hybrid drivetrains, or alternative fuels. Health benefits are achieved by scrapping the old buses and replacing them with cleaner ones.

School bus fleet owners showed a tremendous demand for rebates. During the one month open application period, EPA received over 1,000 applications from school bus fleet owners requesting more than $70 million to replace over 2,800 buses across the nation. EPA conducted a random lottery to select twenty-eight

applicants to replace 76 buses with rebates totaling $2 million. EPA announced these selectees in January 2013. Matching funding contributed was $6 million.

Selected applicants were notified and given 90 days to submit purchase orders to EPA to ensure they were making adequate progress on replacing the buses. Those selected applicants that did not submit the purchase order within 90 days were replaced with applicants from the waitlist. In total, selectees had to replace and scrap the old buses within 9 months of their selection. After submitting the appropriate paperwork, they received their EPA rebate.

In total, the school bus rebate program is estimated to have reduced 11 tons of PM, 215 tons of NO_X, 18 tons of HC and 78 tons of CO.

The 2013 Construction Equipment Rebate Program

EPA selected the construction sector for its FY 2013 round of rebates with $2 million in available funding. EPA chose construction equipment, part of the nonroad sector, after offering rebates to on-road school buses the previous year. In November 2013, EPA opened the application period for the 2013 Construction Equipment Funding Opportunity. EPA accepted applications until January 2014. This funding opportunity allowed public fleets and private fleets to retrofit Tier 2 or Tier 3 emissions standard construction equipment engines with Diesel Particulate Filters (DPFs) or to replace engines with engines certified to cleaner emissions standards. In order to maximize health benefits, the construction equipment had to operate in priority counties—areas with air quality challenges. In order to be eligible, projects had to be located in: PM 2.5 or 8-Hr Ozone Nonattainment Areas or 8-Hr Ozone Maintenance Areas, areas that participate in EPA's Ozone Advance Program or PM Advance Program, and/or counties where all or part of the population is exposed to more than 2.0 $\mu g/m^3$ of diesel particulate matter emissions as determined by the 2005 National-Scale Air Toxics Assessment.

Selected applicants had twelve months from the date of selection to take delivery and install the new Diesel Particulate Filters or to replace the engine. Those replacing engines also had to provide proof of scrappage for the old engine to ensure that it was taken out of use.

EPA received nineteen applications requesting over $1.3 million in rebate funding. However, some applicants experienced issues with technology applicability or their portion of the cost-share. In the end, EPA awarded $52,000 to 3 applicants to install one DPF and two engine replacements. The rebates reduced an estimated 11 tons of NO_X; 1 ton of PM; 1 ton of HC; and 6 tons of CO.

Lessons Learned and Looking Ahead

Fleet owners across a variety of sectors were very enthusiastic about the pilot rebate program. All of the DERA program's stakeholders praised the program for inducing fleet owners to replace older dirtier engines. Without the rebate, many of these owners would not have been able to afford the replacement.

The construction program did not receive the same response as the school bus program, and there are a few likely reasons. EPA wanted to prioritize equipment operating in areas of poor air quality as well as those model years most cost-effective to upgrade or replace. Selected applicants who wanted to install diesel particulate filters needed to spend two weeks data-logging to make sure their engine was appropriate for DPF installation. The complexity, location requirement, and added steps were deterrents for potential applicants so EPA received fewer applications than the more straightforward requirements for school bus replacements. Another impediment is likely that most heavy-duty diesel equipment is operated by private entities; however, DERA cannot directly fund private fleet projects unless the private entity has a contract or lease with a public entity

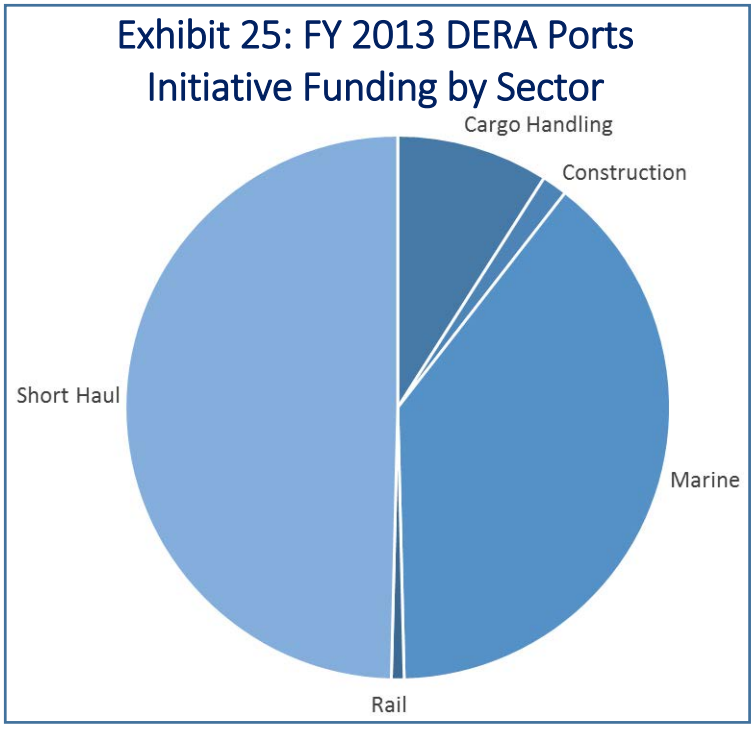
Given the success of the School Bus Replacement Rebate Program and the importance of children's health, EPA will likely fund more school bus rebates in the future. These rebates make a visible impact in communities across the country by providing children with healthier rides to school.

Section 5: DERA Ports Initiative

Ports play a significant role in the nation's transportation system and goods movement supply chain. Many ports are located in areas with high percentage of low income and minority populations who are often disproportionately impacted by diesel emissions associated with port activities. Ships and harbor craft are usually the largest contributors of diesel pollution at ports. Marine engines, cargo handling equipment, drayage trucks, and locomotives are also contributors of diesel pollution at ports. Port authorities, terminal operators and fleet owners, drayage truckers, and rail operators all have a role in helping to reduce diesel emissions at ports and surrounding communities. Reducing exposure to diesel exhaust in and around ports is important for public health and the environment.

In 2013, EPA initiated "A National Conversation on Ports" to exchange views and develop a shared understanding of the challenges and opportunities of ports and port communities. These meetings allowed EPA to hear directly from those whose lives are most closely tied to ports. These meetings culminated in the National Port Stakeholders Summit held in April, 2014.

Since 2008, fleets operating at marine and inland water ports have been a target fleet for DERA funding. EPA set aside $4 million for the FY 2013 Ports RFP. This was the first time DERA funding had been used in a sector-specific RFP. Eligible entities included public port authorities with jurisdiction over transportation or air quality at a marine or inland water port located in an area of poor air quality.[1] Community groups, local governments, terminal operators, shipping carriers, and other business entities involved in port operations were encouraged to partner with port authorities. EPA received eight applications requesting more than $9 million in funding. EPA funded six projects that replaced drayage trucks, retrofitted cargo handling equipment, repowered a switcher locomotive, replaced older shuttle carriers with hybrids, and installed marine shore power infrastructure, see Exhibit 25. Matching funding contributed was $7.8 million.



DERA FY 2013 Ports RFP projects reduced an estimated 3,100 lifetime tons of NO_X; 100 tons of PM; 150 tons of HC; 300 tons of CO; and 30,100 tons of CO_2. These projects also saved more than 2.6 million gallons of fuel.

Photo Courtesy of Virginia Maritime Association

Cleaning Up Emissions from Port Harbor Craft

This project, awarded to the Virginia Maritime Association, will upgrade and replace two very old Tier 0 (unregulated) marine propulsion engines in one tug boat with EPA Tier 3-certified marine engines. This tug boat, the *G.M. McAllister*, is a 110-foot marine tug boat that operates out of Newport News, VA.

This vessel is used primarily for ship docking assistance, as well as general harbor services. The G.M. McAllister operates for approximately 1,300 hours per year and consumes approximately 160,000 gallons of fuel annually. This project will lower particulate matter, NOx and carbon dioxide emissions.

Lessons Learned and Looking Ahead

Ports are critical for commerce and are a keystone for economic growth in the U.S. However, they often can be a growing source of pollution, including greenhouse gases and air pollution. Over 41 million people in the U.S.--roughly one in eight--are exposed to air pollution coming from port operations, and as a result, are at higher risk of developing asthma, heart disease, and other health problems. A high concentration of legacy fleets operate in and around ports. Diesel emissions from these fleets pose a number of health risks to the neighboring population. Equipment and vehicles used at ports also contribute to our nation's greenhouse gas emissions. Ports can significantly reduce these harmful emissions by implementing newer technologies and changing key practices.

Ports and goods movement remain a priority for the EPA and the DERA program. This funding has been instrumental in furthering emissions reductions through clean diesel projects located at ports and goods movement hubs.

In addition, EPA has launched a Ports Initiative designed to support ports, communities and other stakeholders in taking on this challenge and finding common sense solutions that protect local communities and port workers from

harmful air emissions while also reducing the greenhouse gas emissions that contribute to climate change. EPA is organizing a group of industry, community, State and local government experts, under the Clean Air Act Advisory Committee, dedicated to providing EPA with advice and insight on strategies and solutions that will advance emissions reductions to protect the air in communities near ports. Throughout this process stakeholders have expressed the importance of the DERA program in reducing emissions from the legacy fleet of diesel engines. Recommendations from this group are expected in 2016.

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[1] Areas of poor air quality included areas:

1. Designated as particulate matter or ozone nonattainment areas;
2. Where all or part of the population is exposed to more than 2.0 µg/m3 of diesel particulate matter emissions in EPA's 2005 National-Scale Air Toxics Assessment; and/or
3. That participated in EPA's Ozone or PM Advance Program.

Looking Ahead for the DERA Program

Even with implementation of EPA's stringent standards for new on-highway and nonroad engines, EPA estimates that approximately one million engines from the legacy fleet will still remain in use in the year 2030. These engines will continue to affect the environment and public health and will not be touched by fleet turnover. Some of these engines will be decades old, pre-dating modern engine technology, yet still in use. In fact, EPA estimates that in 2025, mobiles sources will still make up about 45% of total NO_X sources, with the legacy fleet portion about 15%. In addition, the legacy fleet will contribute about 20% of the direct PM emissions from mobile sources in the year 2025. The DERA program is designed to target removal and replacement of these remaining engines of the legacy fleet to protect public health and the environment.

EPA estimates that DERA funding has reduced 14,700 tons of PM and 335,200 tons of NO_X since the first grants in 2008. These emission reductions have saved billions in health care costs. DERA projects have retrofitted or replaced nearly 73,000 engines in the nation's legacy fleet. Diesel engines are long-lasting and many pre-date the EPA's stricter emissions standards. DERA funding helps to address these engines that emit higher levels of diesel exhaust and contribute to poor air quality. DERA helps promote fleet turnover, which can have major health benefits for communities surrounding ports, rail yards, distribution centers, and schools. The Diesel Emissions Reduction Act is currently authorized through 2016.

Photo courtesy of Sara Bartholomew, USEPA

As the program looks ahead to the challenges of cleaner movement of goods through the nation's supply chain, reducing black carbon pollution, and assisting environmentally challenged communities, DERA will continue to follow its guiding principles for all future implementation:

- Target areas and populations with disproportionate levels of exposure to diesel exhaust while maximizing cost-effectiveness.
- Prioritize children's health with a goal of every child riding to school in a bus that meets the latest on-highway standards.
- Target projects that reduce emissions from engines involved in goods movements and freight and frequently found operating at ports.
- Increase greenhouse gas and black carbon reductions from DERA projects while continuing to reduce particulate matter and other criteria pollutants.
- Design each DERA program opportunity to fund the most beneficial projects and maximize cost-effectiveness.
- Continue to reduce pollution from diesel engines by partnering with key stakeholders.
- Provide assistance to state and local governments in the development of their own clean diesel programs.
- Continue verifying performance of emission reduction technologies in the field.
- Maximize health benefits from clean diesel projects.

Appendix A: National Program Evaluation Criteria

- Project summary and overall approach
- Results – Outcomes and Outputs
- Programmatic priorities
  - Location
  - Diesel reduction effectiveness
  - Maximization of public health benefits
  - Utilization of community based multi-stakeholder collaborative process
  - Conservation of diesel fuel
- Regional Significance
- Past performance – Programmatic capability and reporting on results
- Staff expertise/qualifications
- Budget/resources
- Past expenditure of awarded grant funds
- Applicant fleet description

For the Recovery Act grant competition, EPA used the same criteria but also took job creation/retention and "shovel-ready" projects into consideration.

For more detailed information about the Request for Proposals, please see www.epa.gov/cleandiesel/clean-diesel-national-grants#rfp.

Appendix B: DERA Projects and Case Studies

Complete list of DERA and ARRA-funded national competitive projects:

FY2012-2015 www.epa.gov/cleandiesel/clean-diesel-national-grants#dera2

FY2008-2011 www.epa.gov/cleandiesel/clean-diesel-national-grants#dera1

Complete list of Tribal projects:

www.epa.gov/cleandiesel/clean-diesel-tribal-grants#projects

Complete list of Ports RFP projects:

FY2014 www.epa.gov/ports-initiative/funding-projects-improve-air-quality-ports#awarded2014

FY2013 www.epa.gov/ports-initiative/funding-projects-improve-air-quality-ports#awarded2013

Complete list of State Allocations:

FY2012-2015 www.epa.gov/cleandiesel/clean-diesel-state-allocations#alloc2

FY2008-2011 www.epa.gov/cleandiesel/clean-diesel-state-allocations#alloc1

Complete list of Rebates:

FY2015 School Bus www.epa.gov/cleandiesel/clean-diesel-rebates#2015sb

FY2014 School Bus www.epa.gov/cleandiesel/clean-diesel-rebates#2014sb

FY2013 Construction www.epa.gov/cleandiesel/clean-diesel-rebates#2013co

FY2012 School Bus www.epa.gov/cleandiesel/clean-diesel-rebates#2012sb

Appendix C: Map of Diesel Collaboratives

Exhibit 26: EPA Regions and Regional Clean Diesel Collaboratives

[Northeast Diesel Collaborative](#)

[EPA Region 1:](#) Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and 10 Tribal Nations

[EPA Region 2:](#) New Jersey, New York, Puerto Rico, the U.S. Virgin Islands and 8 Tribal Nations

[Mid-Atlantic Diesel Collaborative](#)

[Region 3:](#) Delaware, District of Columbia, Maryland, Pennsylvania, Virginia and West Virginia

[Midwest Clean Diesel Initiative](#)

[Region 5:](#) Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin and 35 Tribal Nations

[Rocky Mountain Clean Diesel Collaborative](#)

[Region 8:](#) Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations

[Southeast Diesel Collaborative](#)

[Region 4:](#) Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and 6 Tribal Nations

[Blue Skyways Collaborative](#)

[Region 6:](#) Arkansas, Louisiana, New Mexico, Oklahoma, Texas and 66 Native Tribes

[Region 7:](#) Iowa, Kansas, Missouri, Nebraska and 9 Tribal Nations

[West Coast Collaborative](#)

[Region 9:](#) Arizona, California, Hawaii, Nevada, Pacific Islands and 148 Tribal Nations

[Region 10:](#) Alaska, Idaho, Oregon, Washington and 271 Native Tribes