



“Because there are so many ways to reduce diesel emissions, every port can find a way to participate in the Clean Ports USA program. Technological strategies can yield savings in fuel and maintenance costs, while operational strategies that decrease turn-times and improve efficiency can help mitigate capacity constraints.”

—Meredith Martino, Manager of Government Relations
and Environmental Policy,
American Association of Port Authorities

Why Reduce Diesel Emissions from Ports?

Reducing exposure to diesel exhaust from vehicles and equipment at ports is an important public health and environmental goal. Diesel exhaust is likely to be carcinogenic to humans. The exhaust contains particulate matter (PM) and nitrogen oxide (NO_x), which increase ozone levels and contribute to regional haze. This pollution has been linked to a range of serious respiratory and cardiovascular illnesses, including chronic bronchitis and aggravated asthma.

EPA supports the reduction of diesel emissions through **Clean Ports USA**. In addition, EPA's SmartWay Transport Partnership, which works closely with Clean Ports USA, challenges freight companies operating at ports to improve the environmental performance of their fleets and to move goods more efficiently. Innovative ports are developing emissions inventories and taking advantage of the emissions reduction opportunities available through initiatives supported by EPA. As a result of their voluntary actions, port leaders are receiving national recognition for developing and implementing strategies to measure and reduce emissions.

Why You Should Take Action Now

Looking ahead, U.S. international waterborne freight is forecasted to double by 2020. As cargo volumes rise, port authorities will continue to face the challenge of increasing cargo movement efficiency and enhancing environmental quality. You can be part of the solution and earn recognition by taking action now. We can assist you to minimize the effects of freight movement on public health and the environment.

- ☀ Lower the public health risks for asthma, respiratory illnesses, and cardiovascular disease for port employees and your community.
- ☀ Improve your port's bottom line by saving fuel and increasing operational efficiency, while decreasing diesel emissions.
- ☀ Enhance relationships with neighboring communities while meeting customers' needs.

Meeting national clean air goals will result in substantial public health benefits, and ports play a key role.

Through the voluntary **National Clean Diesel Campaign**, EPA is working with port authorities, terminal operators, and trucking and rail companies to promote cleaner diesel technologies and strategies through education, incentives, and financial assistance for diesel emission reduction at ports. EPA also encourages port operators to use SmartWay Partners to transport freight.



CLEANPORTSUSA

Each port is unique. A wide selection of cost-effective approaches, operational strategies, and technology solutions can be tailored to fit the needs of your port. These solutions and strategies help reduce diesel emissions from cargo handling equipment, ferries, trucks, rail yards, and marine vessels, while they support the business interests of your port.

Cost-Effective Strategies

Air emission reduction strategies are cost-effective, offer operational efficiencies, and benefit ports through improvements in equipment maintenance, safety, and reliability.

Information technology (IT) solutions in gate management, cargo tracking, and employee identification are being used to improve operational efficiency. IT strategies also help the environment by reducing unnecessary engine idling and by shortening queuing lines.

Technology Strategies

Diesel emissions can be dramatically reduced by a variety of technologies. These include the use of cleaner fuels and retrofitting, repowering, or replacing equipment.

-  **Cleaner Fuel** strategies utilize cleaner fuels such as ultra-low sulfur diesel (ULSD), emulsified fuel, biodiesel, and natural gas.
-  **Retrofit** strategies use aftertreatment technologies on existing equipment or vehicles to reduce PM, NO_x, greenhouse gases, and other pollutants. EPA verifies the emission performance of retrofit technologies through rigorous third-party testing and evaluation.
-  **Repower** strategies replace an older engine with a newer, cleaner engine; an engine that uses cleaner fuel; or a highway engine manufactured to stricter standards where the nonroad engine duty cycle fits.
-  **Replacement** strategies retire the old diesel equipment and replace it with new, more efficient diesel equipment that meets newer, more stringent EPA standards.
-  **Rebuild** strategies maintain proper tuning and handling of the engine for better efficiency and lower emissions. Engines that are properly maintained and tuned perform better and typically emit less PM and other pollutants.

Learn from Port L

Port Authority of New York & New Jersey

The Port Authority of New York & New Jersey has spearheaded infrastructure improvements at its marine terminal facilities, while also benefiting from the voluntary actions of its tenants. For example, the Port Authority embarked on a multi-million dollar rail enhancement program and a Port Inland Distribution Network System using barges and railcars. Both projects reduce air emissions by taking trucks off the road.



What are the Benefits?

Although the number of pieces in the tenants' 2004 nonroad fleets has increased by 19 percent since 2002, the average number of operating hours has increased by 5 percent, and the total number of containers has increased by 25 percent, overall emission estimates for key pollutants, in tons per year, have decreased significantly through voluntary fleet modernization. For example:

- NOx has been reduced by 31 percent.
- PM, carbon monoxide (CO), and volatile organic compounds (VOC) have been reduced by 32 percent.
- Sulfur dioxide (SO₂) has been reduced by 35 percent.

Photo courtesy of The Port Authority of New York and New Jersey.

Georgia Ports

The Georgia Ports Authority meets customer needs by implementing a Web Access Gate Management System that improves efficiency and increases the number of gate transactions per hour.

What are the Benefits?

Gate appointments use and alert terminals in a drop-off cargo, reducing and idle emissions. Customer skyrocketed since the in management system the

- Cuts processing time trucks.
- Shortens queuing line terminal operational
- Saves 3,020 gallons NOx per day. This is tion that 5,500 trucks peak day, cutting 40

Leaders' Successes

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Port of Long Beach

Recipient of the 2005 EPA Environmental Achievement Award and 2004 American Association of Port Authorities Environmental Improvement Award, the Port of Long Beach (POLB) installed more than 600 diesel oxidation catalysts on its cargo handling equipment and plans to install more. POLB also uses cleaner fuels, such as emulsified diesel fuel, on cargo-handling equipment for additional air pollution reduction benefits.



What are the Benefits?

- Reduced PM emissions by 50 percent and NOx emissions by 20 percent using a combination of emulsified diesel fuel and diesel oxidation catalysts.
- Extended engine life and reduced maintenance costs by using lower sulfur fuels.
- Reduced PM by 15 tons per year.*
- Reduced NOx by 44 tons per year.*
- Received federal and state funding for diesel emission reduction projects, in addition to \$1 million in port funding.
- Improved community relations.

* California Air Resources Board Verification specification and California's OFFROAD model were used to determine emission reduction data.

Operational Strategies

Emissions can be reduced by implementing operational strategies that maximize the efficient use of port equipment and vehicles while the flow of cargo is optimized.

-  **Container Management** is achieved by better use of IT, the use of stacking practices (rail or barge), and direct intermodal transfers to reduce container movement.
-  **Efficient Freight Movement** can result in emission reductions if cleaner technology is used by truck, barge, or rail systems to transport materials. Ports may want to plan for on-dock rail, in lieu of trucks, and ensure that full rail loads leave the port.
-  **Truck Idle-Reduction** is achieved by implementing gate efficiencies, terminal designs, and Web-based appointment systems or chassis pools that shorten queuing lines and result in less idling. Ports can also introduce idling-reduction rules, use idle reduction technologies, or simply call for voluntary action on the part of drivers.
-  **Shoreside Power** uses dock-side electricity to power auxiliary devices for marine vessels. This method is referred to as “cold ironing,” a ship-to-shore power connection system that allows the ship to “plug in” to an alternative power source and can require substantial infrastructure investment for both ports and vessels.

Did You Know?

- Switching to fuels that contain lower levels of sulfur reduces SO_2 and PM emissions and enhances the effectiveness of retrofit technologies.
- Low sulfur fuels have a cleaning effect on the engine that reduces maintenance costs and extends oil change intervals.
- Diesel particulate filters with ULSD reduce PM by 60 to 90 percent.
- Diesel oxidation catalysts reduce PM by 10 to 50 percent.
- Eliminating unnecessary truck idling can save thousands of gallons of diesel fuel per day.





“At the Port of New York and New Jersey, we view diesel emission reduction initiatives as a win-win situation: they benefit the environment and are supported by a business case to modernize equipment and infrastructure.”

— Joseph Monaco, Manager of Environmental Projects,
Port Authority of New York & New Jersey

Through **Clean Ports USA**, the U.S. Environmental Protection Agency (EPA) is partnering with port authorities and terminal operators to reduce diesel emissions at our nation's ports.

Clean Ports USA is one component of EPA's **National Clean Diesel Campaign**, a voluntary initiative designed to reduce the pollution emitted from diesel engines across the country, through the implementation of varied control strategies and the sustained involvement of national, state, and local partners.



National Clean Diesel Campaign

How Do I Get More Information?

Visit www.epa.gov/cleandiesel
to find detailed information about
the National Clean Diesel Campaign.

