



Maritime Ports and Air Quality

The Air Resources Board (ARB) is committed to ensuring that all Californians can live, work, and play in a healthful environment, free from harmful exposure to air pollution. Air pollution from maritime port activities is a significant and growing concern in California. Diesel-powered vehicles and engines at the ports emit soot, or diesel particulate matter (diesel PM), and other air pollutants that can increase health risks to nearby residents. Ports operations are also a significant source of oxides of nitrogen (NO_x), which can contribute to the formation of regional smog, or ozone, and fine particulate matter. Continued growth in port activities, driven by increased global trade, requires that air quality regulators, port operators, shipping companies, and others act quickly to identify and implement new strategies to reduce emissions.

Sources of Pollution

A wide variety of vehicles and engines used to move cargo in and out of the ports contribute to air pollution. Oceangoing ships are one of the primary sources of port-related soot and smog-forming

Why is ARB concerned about Diesel PM?

Diesel engines emit a complex mixture of gaseous and solid air pollutants. The solid components of diesel exhaust are known as diesel PM. Diesel PM includes carbon particles or "soot" that can be visible in exhaust streams, and particles too small to be seen by the naked eye. In 1998, ARB identified diesel PM as a toxic air contaminant based on its potential to cause cancer. Health studies also show that particulate matter (of which diesel PM is a component) can contribute to premature death, worsen asthma symptoms, and cause other health problems.

ARB has made it a top priority to reduce diesel PM emissions at the ports, in surrounding communities, and throughout the State. In 2000, ARB adopted the *Risk Reduction Plan to Reduce Particulate Matter from Diesel-Fueled Engines and Vehicles*. The Plan sets the goals of achieving a 75 percent reduction in diesel PM by 2010 and an 85 percent reduction in diesel PM by 2020. ARB is reducing diesel PM by requiring cleaner new engines and fuels, and by reducing emissions from existing engines through regulations, incentive programs, targeted enforcement, idling restrictions, and other strategies.



emissions in California. Other sources of emissions at and around the ports include: harbor craft, such as fishing boats and tugboats; cargo handling equipment, such as cranes and yard hostlers; and diesel trucks and locomotives used to pick up and drop off cargo.

International Trade Through California's Maritime Ports

International trade through the ports is an integral component of the local, State, and national economy. California's ports generate billions of dollars in State and local tax revenues and create hundreds of thousands of local and regional jobs. The value of foreign vessel trade through California's ports was estimated to be \$200 billion in 2003, and is expected to triple over the next twenty years.

In the 1970's, most of the country's international maritime trade traveled through East Coast ports. In the decades since, the amount of cargo travelling through California's ports has grown, reflecting increased trade with Asia. By 2001, nearly half of the United State's container imports and one third of the country's container exports traveled through California ports. The Ports of Los Angeles, Long Beach, and Oakland, together, handle over 90 percent of California's port cargo.

Collaborative Effort to Reduce Emissions

International, national, State, and local government collaboration is critical to clean up the air at and around California's ports. Port operators, the private sector, and community stakeholders also have pivotal roles in helping to reduce port-related emissions.

Many of the vehicles and engines at the ports are getting progressively cleaner, but much more is left to do. The effects of growth in shipping volumes and related port activity could outpace the air quality benefits of cleaner vehicles and engines unless we act now. In addition, the large diesel engines used at the ports can last for decades, so many older, dirty engines are still in use. This Fact Sheet describes some of the success stories to date and the efforts underway to help reduce emissions in and around California's ports.

Strategies to Reduce Emissions from Port Operations

Ships and Harbor Craft

The International Maritime Organization (IMO) and the U.S. Environmental Protection Agency (U.S. EPA) have established emission standards for oceangoing vessels and U.S.-flagged harbor craft, respectively. More stringent emission limits are technically feasible, however, and are needed to address this growing source of air pollution. Other steps being taken to reduce emissions from ships and harbor craft include:

- Incentives for Cleaner Engines – ARB and local air districts have provided over \$17 million dollars to replace over 300 older, dirty diesel engines in harbor craft with newer, cleaner engines resulting in about 900 Tons of NOx and about 50 Tons of PM reduced each year.
- Fewer Ship Emissions in Transit – A voluntary speed reduction program for ships approaching and leaving the Ports of Los Angeles and Long Beach is reducing NOx emissions by about one ton per day.
- Enhanced Enforcement – A local air district outreach and enforcement program at the Ports of Long Beach and Los Angeles has helped reduce excessive smoke emissions from ships.
- Fewer Dockside Emissions – In response to community concerns, the Ports of Los Angeles and Long Beach recently inaugurated the first of several planned systems to allow docked ships to turn off their auxiliary engines and plug into cleaner dockside electricity. Four cargo vessels that bring cargo to a steel finishing facility in the Bay Area have been "plugging in" since the early 1990's.



- Cleaner Fuel for Ships – ARB is developing a rule that would require oceangoing ships to use a cleaner marine diesel fuel to power auxiliary engines while in California coastal waters and at dock. Under the proposal, ships that frequently visit California ports would also be required to further reduce their emissions with strategies like those discussed in this Fact Sheet. ARB is also working with U.S. EPA to explore the feasibility of pursuing a West Coast Sulfur Emission Control Area, where ships would be required to burn cleaner fuel.
- Cleaner Harbor Craft and Fuel – In late 2004, ARB approved a regulation that requires harbor craft to use the same cleaner diesel fuel used by on-road trucks in California. In the following year, ARB will consider a rule that would require additional controls for in-use harbor craft, such as the use of add-on emission controls and accelerated turnover of older engines. In June 2004, U.S. EPA signaled its intent to consider further reducing allowable emissions from new harbor craft beginning in 2011.
- Cleaner Oceangoing Ships – ARB is working with shipping companies, U.S. EPA, local air districts and others to test emission control technologies that will reduce emissions from oceangoing ships. Several ships that regularly call on Bay Area ports are now running with state-of-the-art NOx emission controls.

Diesel Trucks

New diesel trucks are getting progressively cleaner as a result of California and national emission standards. By 2010, diesel PM and NOx emissions from new heavy-duty diesel truck engines will be about 98 percent lower than uncontrolled levels. However, many of the trucks that access the ports – often through the surrounding communities – are short-haul trucks that tend to be older and dirtier. Actions being taken to clean up the existing truck fleet include:

- Newer, Cleaner Vehicles – ARB and U.S. EPA helped launch a local program to replace the dirtiest pre-1984 diesel trucks that serve the Ports of Long Beach and Los Angeles with newer, cleaner trucks. The Port of Oakland has a similar program to replace older diesel trucks.
- Targeted Enforcement – ARB conducts targeted smoking truck enforcement in communities and residential areas near the ports.
- Shorter Truck Waits – Automated truck appointment systems at the ports have helped reduce air pollution from truck lines and idling.
- Less Truck Idling – ARB adopted a rule in July 2004 to limit idling of heavy-duty diesel trucks in California -- including those serving the ports -- to five minutes. Community members can call ARB at 1-800-END-SMOG (363-7664) to report excessive idling or smoking vehicles.
- Cleaner Fuel – An ARB regulation to clean up the diesel fuel sold statewide by 2006 paves the way for the widespread use of soot pollution traps on diesel trucks and equipment.
- Cleaner Transport Refrigeration Units – ARB adopted a regulation in February 2004 to reduce diesel soot from the transport refrigeration units used to protect temperature-sensitive products in trucks, shipping containers, and rail cars beginning in 2009.



- Cleaner Truck Fleets – ARB is developing a rule over the next two years to require heavy-duty diesel truck fleets to accelerate the replacement of older existing trucks or engines with a cleaner model or apply add-on controls.

Locomotives

Many trains at and around the ports run on relatively poorly controlled diesel engines; these older, dirtier engines are a significant source of NOx and diesel soot. Strategies to reduce train emissions at the ports include:

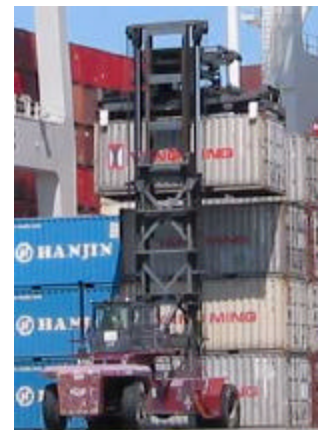
- Cleaner Fuel – In late 2004, ARB approved a regulation that requires locomotives that operate primarily in California to use cleaner diesel fuel.
- Newer, Cleaner Locomotives – Pacific Harbor Lines is working with the Ports of Los Angeles and Long Beach and the local air district to replace its fleet of aging switch locomotives with new, cleaner trains.
- Tighter Emission Standards – Federal rules requiring cleaner new and remanufactured locomotives are being phased in through 2005, and U.S. EPA is considering tighter rules for locomotives and fuels beginning in 2011.
- Reduced Locomotive Idling – ARB is working with the rail roads to develop idling reduction strategies for locomotives in California.



Cargo Handling Equipment and Other Portside Sources

ARB and U.S. EPA have adopted rules to require cleaner new off-road engines, including engines used in equipment at the ports. These rules will ultimately result in the emissions from new off-road engines being over 95 percent lower than uncontrolled levels. Port operators have taken a lead role in accelerating the cleanup of existing portside equipment, while local air district rules have helped control emissions from commercial and industrial sources. Specific steps being taken to reduce emissions from these sources include:

- Cleaner Portside Equipment – The Ports of Oakland, Los Angeles and Long Beach are installing pollution traps on over 1,000 pieces of diesel equipment, and are using cleaner fuels in many engines.
- Cleaner Cargo-Handling Equipment – In late 2005, ARB will consider adopting a rule that would reduce diesel soot from the existing yard hostlers and other equipment used to move cargo within the ports.
- Less Coke and Coal Dust – The Port of Long Beach has spent over \$25 million to upgrade petroleum coke storage and handling facilities, in response to a local air district rule designed to prevent coke and coal dust from blowing into nearby communities.



For More Information

Please contact the ARB's Public Information Office at (916) 322-2990, or ARB's web site at <http://www.arb.ca.gov>. You may obtain this document in an alternative format by contacting ARB's ADA Coordinator at (916) 322-4505 (voice); (916) 324-9531 (TDD, Sacramento area only); or (800) 700-8326 (TDD, outside Sacramento).