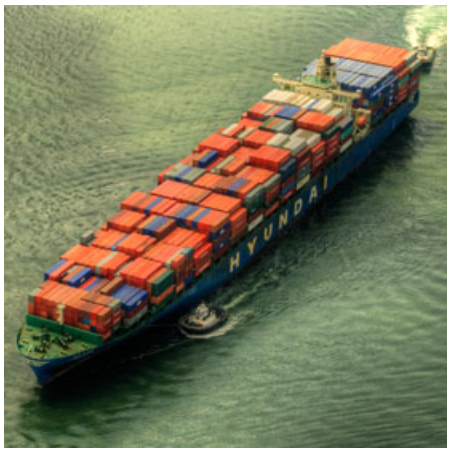
Slowing Cargo Ships More Than Halves Pollution near Ports

Slowing ships can dramatically cut pollution, but few harbors have initiated such efforts

By Brett Israel and Environmental Health News | November 19, 2012

Slowing cargo vessels near coastlines by 10 to 15 miles per hour could dramatically cut ships' air pollution, according to a new study. But only a few U.S. ports have initiated such efforts.



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A speed limit of 14 mph, down from the current cruising speeds of 25 to 29 mph, would cut nitrogen oxides – a main ingredient of smog – by 55 percent and soot by almost 70 percent, according to the University of California, Riverside study. It also would reduce carbon dioxide – a potent greenhouse gas and key contributor to climate change – by 60 percent.

With 100,000 ships carrying 90 percent of the world's cargo, air pollution is a heavy burden for people living near ports, so slowing ships could improve their health, researchers say.

In the study, the ships traveled at speeds already used at the ports of Los Angeles/Long Beach and New York-New Jersey as part of voluntary programs.

"Vessel speed reduction does significantly reduce emissions, and that's why we have had a vessel speed reduction program in place at our port for several years," said Arley

Baker, a spokesperson for the Port of Los Angeles. “It’s both a feasible and practical way to reduce vessel emissions.”

But setting a speed limit on cargo ships has been an elusive goal for port cities because shipping traffic is regulated internationally.

All ocean-going vessels, when they are within 10 nautical miles of a U.S. port, must slow down, to typically 14 mph. The voluntary programs in Los Angeles/Long Beach and New York-New Jersey slow them farther out, up to 40 miles offshore.

A ship’s fuel consumption and emissions increase exponentially with speed, so burning low-grade oil at traditional cruising speeds emits more air pollution than slower ships, according to the study, led by environmental engineer David Cocker.

"Speed reductions, which are known to reduce emissions, would need to be maintained over a very long-term period in order to produce regional air quality benefits," said James Corbett, a professor of marine policy at the University of Delaware, who has studied the impact of the shipping industry on human health. Corbett was not involved with the new study.

The new study measured the emissions of two container vessels traveling between California's Ports of Los Angeles and Long Beach and the Port of Oakland. Emissions were measured near the ports and in international waters.

In international waters, ships burn heavy fuel oil. As it burns, large amounts of particulate matter, sulfur oxides and nitrogen oxides are released.

Studies worldwide have linked particulate matter – soot – to deaths from respiratory disease and heart attacks. Particulates specifically from ocean-going vessels have been linked to an increased number of premature deaths, according to a 2007 study by Corbett published in the journal Environmental Science and Technology.

In addition, the shipping industry is responsible for 3 percent of the world's carbon dioxide emissions, according to the International Maritime Organization, a United Nations agency responsible for marine safety and pollution. Shipping emissions are expected to grow 2 to 3 percent every year over the next three decades [PDF] as shipping traffic grows, according to the IMO.

The industry has dodged tax strategies and international treaties, such as the Kyoto Protocol. The International Maritime Organization has failed to set a cap on greenhouse gas emissions at international meetings in previous years. Under the World Port Climate Initiative, some of the world’s leading ports have committed to reducing their greenhouse gas emissions.

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Some states and local pollution agencies are stepping in. California has banned ships from burning dirty kinds of fuel, and is rolling out other clean port initiatives.

Since 2001, the Ports of Los Angeles and Long Beach – the nation's two busiest shipping ports – have offered financial incentives to shippers that voluntarily reduce their speeds to 14 mph. Baker said it has led to 90 percent compliance.

Smog-causing nitrogen oxides from the Los Angeles port's ships declined 30 percent between 2005 and 2011, while particulate matter decreased about 70 percent. Carbon dioxide was not reported.

"I think it has been quite effective," said Sam Atwood of the South Coast Regional Air Quality Management District, the local air pollution agency that monitors the side-by-side ports of Los Angeles and Long Beach.

In August, the Port of New York and New Jersey approved several initiatives to reduce emissions, including a voluntary speed reduction program similar to the Ports of Los Angeles and Long Beach. Ocean-going vessels that reduce their speed to no more than 10 knots (11.5 mph) starting 20 nautical miles from the entrance to the New York-New Jersey harbor earn financial incentives and recognition.

Smaller ports, such as Port Miami, are considering setting new policies for cargo ship speeds to help clean the air.

Shippers might not want to slow down because "hours lost in transit can cost carriers and their shipping customers dearly," said Aaron Ellis of the American Association of Port Authorities.

An industry group, the U.S. Shippers Association, noted that there are other ways to clean up the industry.

"Speed limits are only one, and not necessarily the most effective, way to reduce greenhouse gas emissions. Vessel owners should be encouraged to implement as many options as possible to meet and exceed emission reduction standards," said Beverly Altimore, executive director of the U.S. Shippers Association.

In Southern California, one other solution has been to supply shore-side power so that ships can plug into the electric grid while docked rather than idling their engines, Atwood said.

The authors of the new study warned that emissions reductions near ports could be negated if the ships travel faster than normal cruising speeds outside of the slow zones.

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"It is important to note that vessels speeding up to make up for lost time at the slower speeds in the [vessel speed reduction] zone could have an overall increase in CO_2 and other emissions," the researchers wrote.

This article originally ran at Environmental Health News, a news source published by Environmental Health Sciences, a nonprofit media company.

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