

SHIPS



Polluting
San Francisco Bay
Skies

Growth

North America

Global shipping volume is projected to triple by 2030.

Energy use by ships in global trade to North America will double by 2015 or 2020.

~ 50,000 cargo ships worldwide contribute as much as 5 percent of global CO₂.

West Coast Fuel Use by shipping = 1.48 million metric tons =

4.8 MMT CO₂

A single cruise ship uses 8 to 9 TONS of bunker fuel per hour at 20 to 22 knots.

Startling fact: The emissions benefits of requiring lower sulfur bunker fuel today within 200 miles of N. A. coastline would be outpaced by emissions growth within 10 years.

California

The gateway to the U. S. market from Asia, California ports handle about 40 percent of consumer goods entering the U. S. Container traffic is projected to triple by 2030 or before.

Port of Oakland

The Port of Oakland is the fourth largest port in the U. S. and is the second largest in California after the Ports of Los Angeles/Long Beach complex. It is the largest in the San Francisco Bay Area. Container traffic is projected to triple by 2020 from 2 million to 6 million TEUs (twenty-foot equivalent units).

2004

Port	Vessel Calls	TEUs
LA/LB	5,083	13, 100,000
Oak	1,797	2,042 ,000
SF	300	32,000



Air Toxics

Ship emissions are one of the largest unregulated sources of diesel exhaust. A single ship at berth produces:

- One ton of smog-forming nitrogen oxides each day
- 100 pounds of cancer-cause particulate matter
- Pollution from ships visiting LA/LB each day produce emissions equal to that of 1,000,000 cars.
- Premature deaths from ships in California are projected to double from 210 today to 540 by 2020 if no new marine fuel or engine standards are put into place.
- West Oakland residents suffer higher exposure to diesel exhaust from ships and other sources; and higher levels of asthma, cancer and other illnesses.

Bay Area Ship Emissions 2004

Tons Per Day

NO_x 40 PM 3.33 SO_x 23 CO₂ 1471

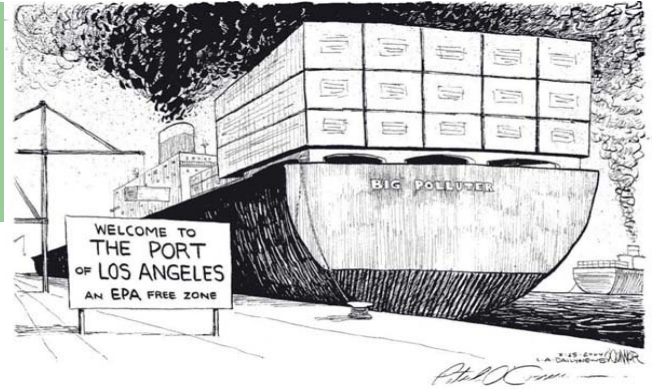
FUELS

Ships use bunker fuel
= the bottom of the barrel

This fuel is the waste product of oil refining and is the dirtiest of diesel fuels. The fuel needs to be heated to be burned in the ship engines. The resulting emissions are high in sulfur, nitrogen oxides and particulate matter. Sulfur content 30,000 ppm avg.

Benefits of Switching to Cleaner Fuels from Marine Bunker

Fuel Type	NOx	PM	SOx
Residual 1.5 % sulfur	0 percent	18 percent	44 percent
Marine Gas Oil .5 % sulfur	6 to 10 per- cent	60 percent	90 percent
CARB On- Road Diesel	16 percent	72 percent	99 percent
Emulsified Fuels	15 to 30 percent	60 percent	na
Biodiesel 100 %	Neutral	60 to 70 per- cent	99 percent



Policy

International Maritime Organization:

Air pollution standard set in 1997, went into force 2005, no real emissions benefits.

Sulfur cap 45,000 ppm for marine fuels.

Sulfur Emission Control Area: 15,000 ppm Baltic Sea, November 2007 North Sea

U. S. Environmental Protection Agency:

U. S. flagged ships must follow IMO; no controls on foreign-flagged; U. S. not a party to air pollution treaty. Failed policy.

California Air Resources Board

All ships must use lighter marine fuels in auxiliary engines, Jan. 1, 2007, 5,000 ppm or less.

Shipping industry filed a lawsuit.

Solutions

1. Stronger CA regulations on marine fuels.
2. Congressional action on marine fuels and engine standards.
3. Port standards and contracts.
4. Stronger international standards for marine fuels and engines.
5. Collaborative programs and incentives for industry.

Maersk has switched to cleaner fuels in all engines while operating in CA.

LA/LB contracting for cleaner fuels and shoreside power.