

Shorepower at Ports

4th Biennial TRB-CMTS Research and Development Conference

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Overview

- Background - EPA's efforts to reduce emissions at ports: regulatory and voluntary
- Types of Shorepower
- Shorepower report

Ripped from the headlines…

Nation & World

US senators want air pollution reduced at ports, railyards

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SUNDAY, NOVEMBER 29, 2015 · THE WASHINGTON POST

Busy ports struggle to curb pollution from diesel

Activists press EPA to regulate diesel exhaust at major ports like emissions from power plants, refineries

BAD AIR BY THE WATER

BY LYDIA DEPILLIS

On New Jersey's map of diesel-exhaust levels, most of the state is a peaceful blue, indicating a relatively low concentration of pollutants. But there's a big angry red splotch where diesel levels are 100 to 1,000 times the benchmark for what's considered safe for people to breathe.

That splotch hangs squarely over the Port of New York and New Jersey, the nation's third-largest gateway for ocean-borne cargo. It also encompasses several low-income communities in Newark, Bayonne and Elizabeth, where asthma is now a leading cause of absenteeism among school-age children.

More recent maps indicate an elevated cancer risk from air pollution in census tracts closest to the port.

It's not just northern New Jersey. Bad

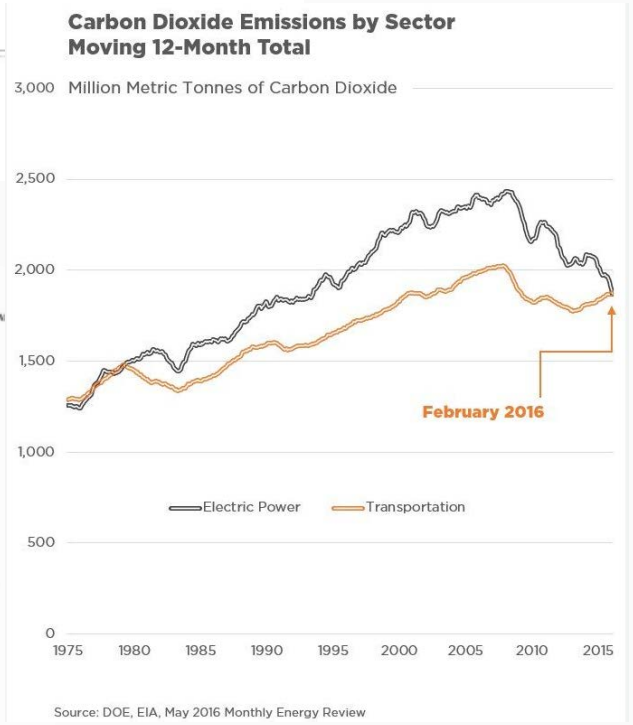
quality, living next to one — with all the exhaust from trucks, ships, planes, trains and cranes — is similar to living next to a coal-fired power plant. Except that the federal Environmental Protection Agency hasn't regulated the ports' cumulative emissions in the way that it has recently gone after major single-source polluters to impose strict new limits on emissions.

The clock is ticking. The widening of the Panama Canal is expected to produce an influx of super-large cargo ships, and many U.S. ports are beefing up their capacity to welcome them. So pollution-control advocates are sending a message that investment in green technology — hydrogen- and electric-powered vehicles and machines, for instance — is needed to make sure that neighborhoods don't suffer even more as freight volumes rise.

"We call these facilities diesel magnets," says

YANA PASKOVA FOR THE W

JOHN MOORE/GETTY IMAGES



Source: DOE, EIA, May 2016 Monthly Energy Review

EPA's Work Affecting Ports

- Comprehensive emission control program
  - Mobile sources
    - Nonroad, and medium and heavy-duty highway vehicles
    - Harborcraft, small commercial vessels, etc.
    - Ocean Going Vessels
  - Fuels: Low sulfur

- Significant emission reductions expected
  - EPA's Ports Initiative – voluntary place-based program working with stakeholders in and around ports to lower emissions

Why a Ports Initiative?

- Ports are critical for commerce and keystone for economic growth – Can be a source of air pollution and climate pollutants
- Ports and surrounding areas - High concentration of older diesel engines with high rates of emissions
- To reduce greenhouse gas (GHG) emissions
- Millions of people live near ports
  - Large number of low-income households, environmental justice areas, and sensitive populations disproportionately impacted
- Explore common sense solutions to protect port communities and workers

EPA Ports Initiative Areas of Focus

Remove Barriers to Technology Development and Application

Emissions Inventories, Tools & Metrics

Develop Strategies for Community–Port Engagement

Create a Bridge to EPA/Federal Partners

Strategies for Ocean Going Vessels

Sector	Strategy
OGV	Fuel Changes (lower sulfur levels, LNG)
	Shore Power
	Stack Bonnets
	Reduced Hotelling

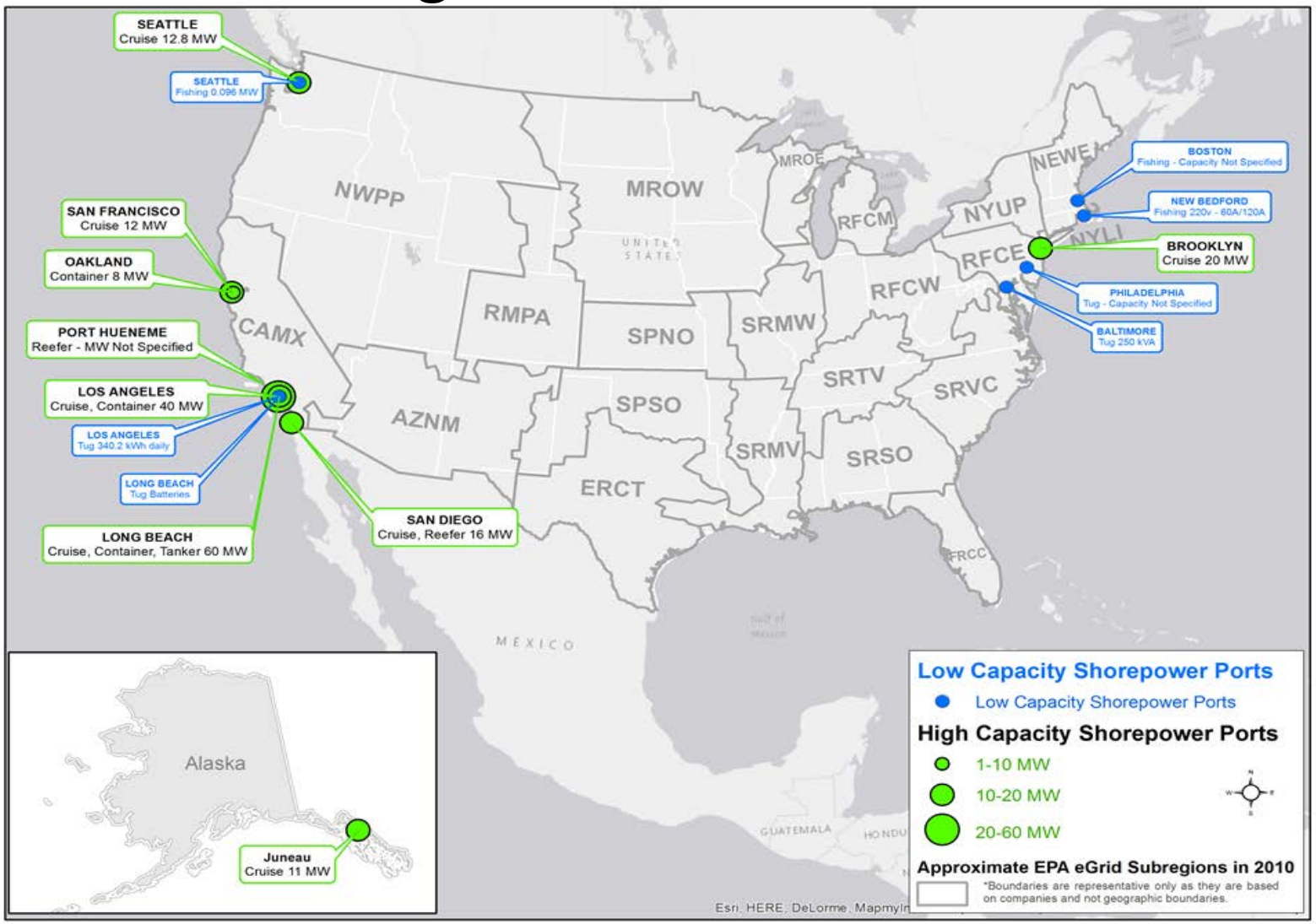
SHORE POWER PORT ASSESSMENT
DRAFT PROJECT REPORT

- Characterizes shorepower systems at U.S. ports
- Developing a methodology for calculating emission reduction of shorepower systems
  - Report to be finalized by August 31.

Shore Power System Standards

Standard	**Capacity**	**Uses**
High Voltage Shore Connection Systems IEC/ISO/IEEE 80005-1:2012	6.6 kV and/or 11 kV	Cruise, Container, Reefer
Low Voltage Shore Connection Systems IEC/ISO/IEEE 80005-3: 2014	220-480 V	Fishing, Tug

DRAFT Existing Shore Power Locations



DRAFT Shore Power Locations

	Port Name	Vessel Types using OPS	Year of Installation
High Capacity	Juneau[6]	Cruise	2001
	Seattle	Cruise	2005-2006
	San Francisco[7]	Cruise	2010
	Brooklyn	Cruise	2015
	Los Angeles	Container Cruise	2004
	Long Beach	Cruise Container Tanker	2011 2009 2000
	San Diego	Cruise Reefer	2010
	Oakland[10]	Container	2012-2013
	Hueneme	Reefer	2014
Low Capacity	Seattle[11]	Fishing	
	Boston[12]	Fishing	
	New Bedford[13]	Fishing	2011
	Philadelphia[14]	Tug	
	Baltimore	Tug	
	Los Angeles / Long Beach	Tug	2009

The Shore Power and Diesel Emissions Model

- Vessel inputs:
  - Installed vessel engine power
  - Hotelling load factor
  - Hotelling power (vessel engine power x hotelling load factor)
  - Vessel emissions factors
- Activity inputs:
  - Vessel port calls per year
  - Hotelling hours per port call
  - Hotelling hours per year (vessel port calls per year x hours per port call)
  - Annual power consumption at berth (hotelling power x hours/yr)

The Shore Power and Diesel Emissions Model

- Shore power inputs:
  - Electricity generation by facility (MWh)
  - Emissions (SO2, NOx, PM10, PM2.5, CO, CO2) by facility
  - Shore power emissions factors (quotient of total emissions and total electricity generation)

- Output:

  Difference = Vessel Power Emissions - Shore Power Emissions

Thank You | Questions

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U.S. EPA, OTAQ, Technology Assessment Center

EPA's Ports Initiative website is at:

http://www.epa.gov/ports-initiative

Shorepower Port Assessment Draft Project Report prepared by: Energy and Environmental Research Associates (EERA): James Corbett, Edward Carr, Bryan Comer and Jordan Silberman