California Progress in Reducing Port and Marine Emissions

Prevention First 2016
Sea Level Rise & Climate Change Panel
Long Beach, CA
September 27-28, 2016

Angela Csondes, Manager
Technical Analysis Section
Overview

- ARB mission and programs for freight transport
- Existing programs for ocean-going vessels
- Future measures

http://www.arb.ca.gov/marine
About the Air Resources Board
Freight Impacts at Many Levels

- Localized health risk
- Regional air pollution
- Global climate change
Equipment-based ARB Freight Rules

- On-road diesel fuel
- Off-road diesel fuel
- Ship fuel
- Port/railyard trucks
- Truck and bus
- Truck idling limits
- Truck/trailer efficiency
- Vessel shore power
- Harbor craft
- Cargo handling equipment
- Industrial equipment
- Off-road equipment
- Transport refrigeration units

Locomotive/railyard agreements
California Sustainable Freight Action Plan

- Statewide effort to improve freight efficiency and transition the freight transport system to zero-emission technologies, while continuing to support California’s economy
- Plan establishes targets and identifies actions to achieve a sustainable freight transportation system

http://www.casustainablefreight.org
Partners

- Local air agencies offer expertise, on-ground presence, research & funding
- Communities raise political will
- Ports offer complementary programs
- Industry forms partnerships and implements emission controls
- EPA can expand requirements to US
Progress in Reducing Freight Emissions in California

Sources: EMFAC 2014, Off-Road Emission Inventory Model, and ARB’s GHG emission inventories
Vessel Program Successes
CA Vessel Fuel Rule

- 2008 CA rule for cleaner fuels within 24 nm zone
- Main & auxiliary engines, auxiliary boilers
- Now: 0.1% sulfur
- Practical experience supported IMO standards and N. American ECA
- CA rule to sunset when federal rule achieves equivalent reductions
Lower Sulfur Ship Fuel = Smaller Pollution Footprint

California without low sulfur ship fuel

California with low sulfur ship fuel

Cancer risk-chances/million
CA At-Berth Rule

- 2007 CA rule for power reductions from vessels at berth using grid-based shore power

- Affects container, refrigerated cargo and passenger vessels

<table>
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<th>Year</th>
<th>% of vessel visits using shore power</th>
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<td>2014</td>
<td>50%+</td>
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<tr>
<td>2017</td>
<td>70%+</td>
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<tr>
<td>2020</td>
<td>80%+</td>
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Shore power ready in CA:
- 23 terminals/63 berths
- >200 vessels
CA At-Berth Rule

- Alternative at-berth reduction technologies for compliance are approved
- 2 barge mounted systems approved for container vessels
- Room for additional innovative technologies
CA Vessel Speed Reduction

- Through partnerships vessel speed reduction has proven successful
- Coast guard has established limit of 15 knots in the SF Bay
- POLA/POLB MOU with industry in 2001 established VSR of 12 knots @ 20nm
  - Offer dockage discounts for VSR @ 40nm
Vessel Emissions in CA: 2000-2030 (to 24nm)
Next Actions
Need to Accelerate Progress

Cut air toxics health risk

Attain air quality standards

Mitigate climate change

Zero-emission technology/ renewable energy
Freight PM$_{2.5}$ Emissions in CA

- Aircraft
- Commercial Harbor Craft
- Locomotives
- Equipment
- Ocean Going Vessels
- Trucks

<table>
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<th>Year</th>
<th>2012</th>
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<th>2040</th>
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<td>15</td>
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Planned CA Actions for Further Vessel Reductions

• Expand existing At-berth rule to capture additional vessels/reductions

• Advocate for tighter international emission standards, plus efficiency targets for existing vessels

• Define “Low-Emission Efficient Ship;” use incentives for advanced technologies
Challenges and Ensuring Continued Success

- Strategic partnerships on solutions
- Well planned investments in the development of new technologies and major infrastructure upgrades
Contact Information

Angela Csondes, Manager
916-323-4882
angela.csondes@arb.ca.gov
http://www.arb.ca.gov/marine

THANK YOU!