

California Progress in Reducing Port and Marine Emissions



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

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 **Air Resources Board**

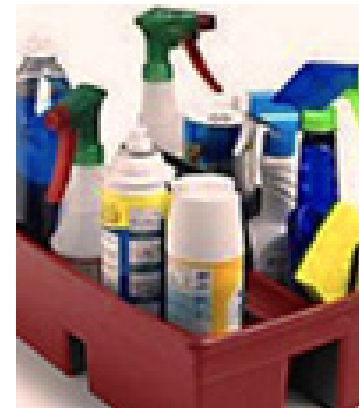
Overview

- ◆ 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

Global climate change



Regional air pollution



Localized health risk



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

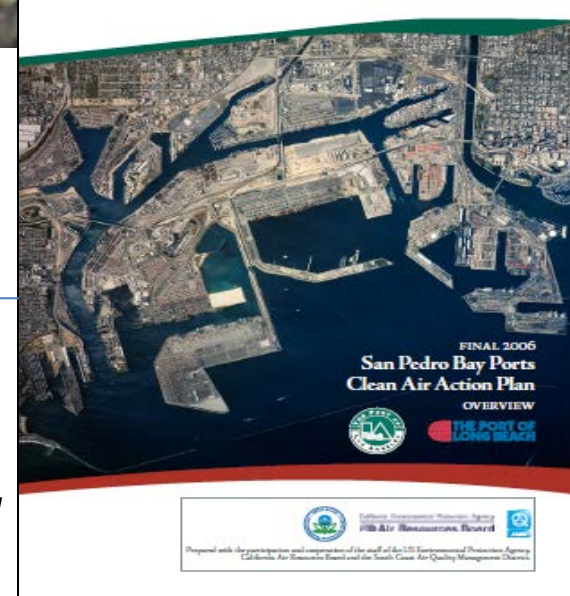


<http://www.casustainablefreight.org>



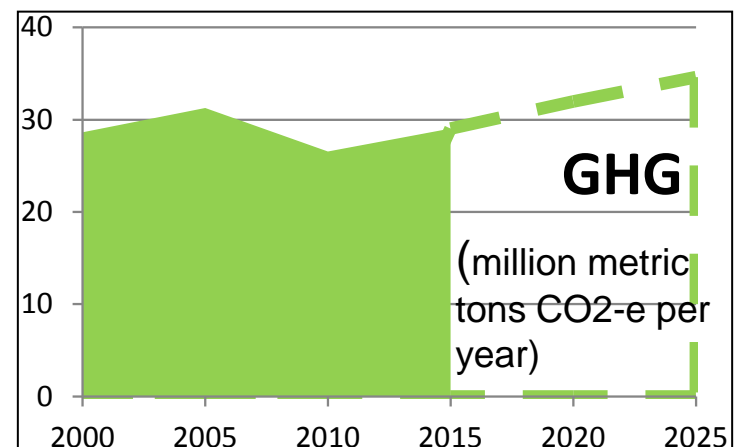
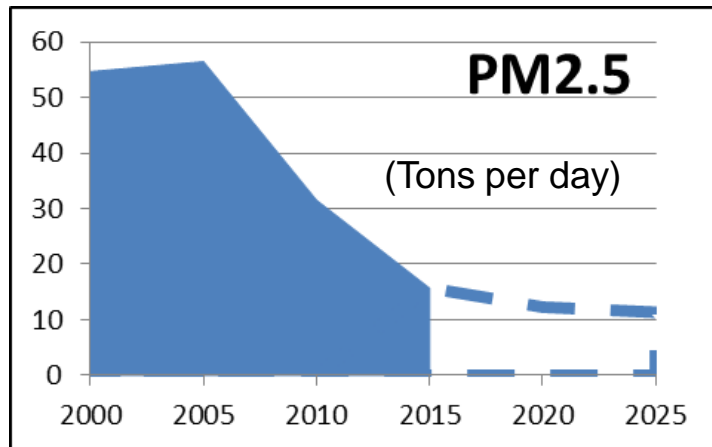
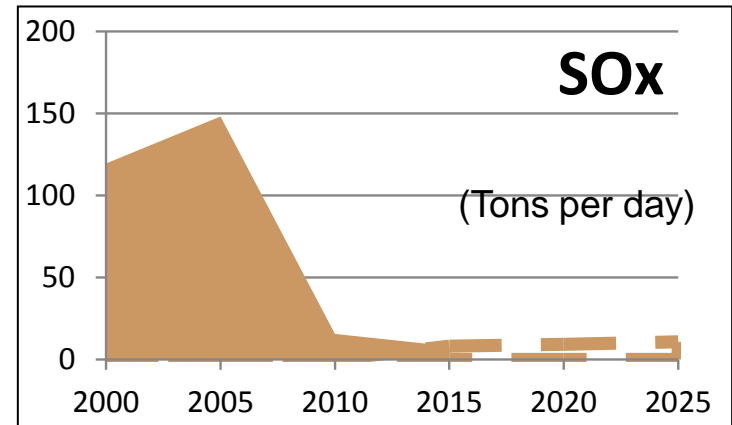
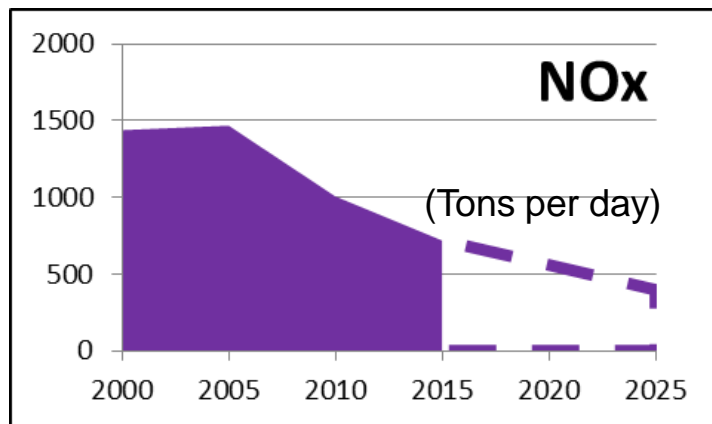
Partners

- ◆ 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



2006 CAAP

Progress in Reducing Freight Emissions in California



Sources: EMFAC 2014, Off-Road Emission Inventory Model, and ARB's GHG emission inventories

Vessel Program Successes

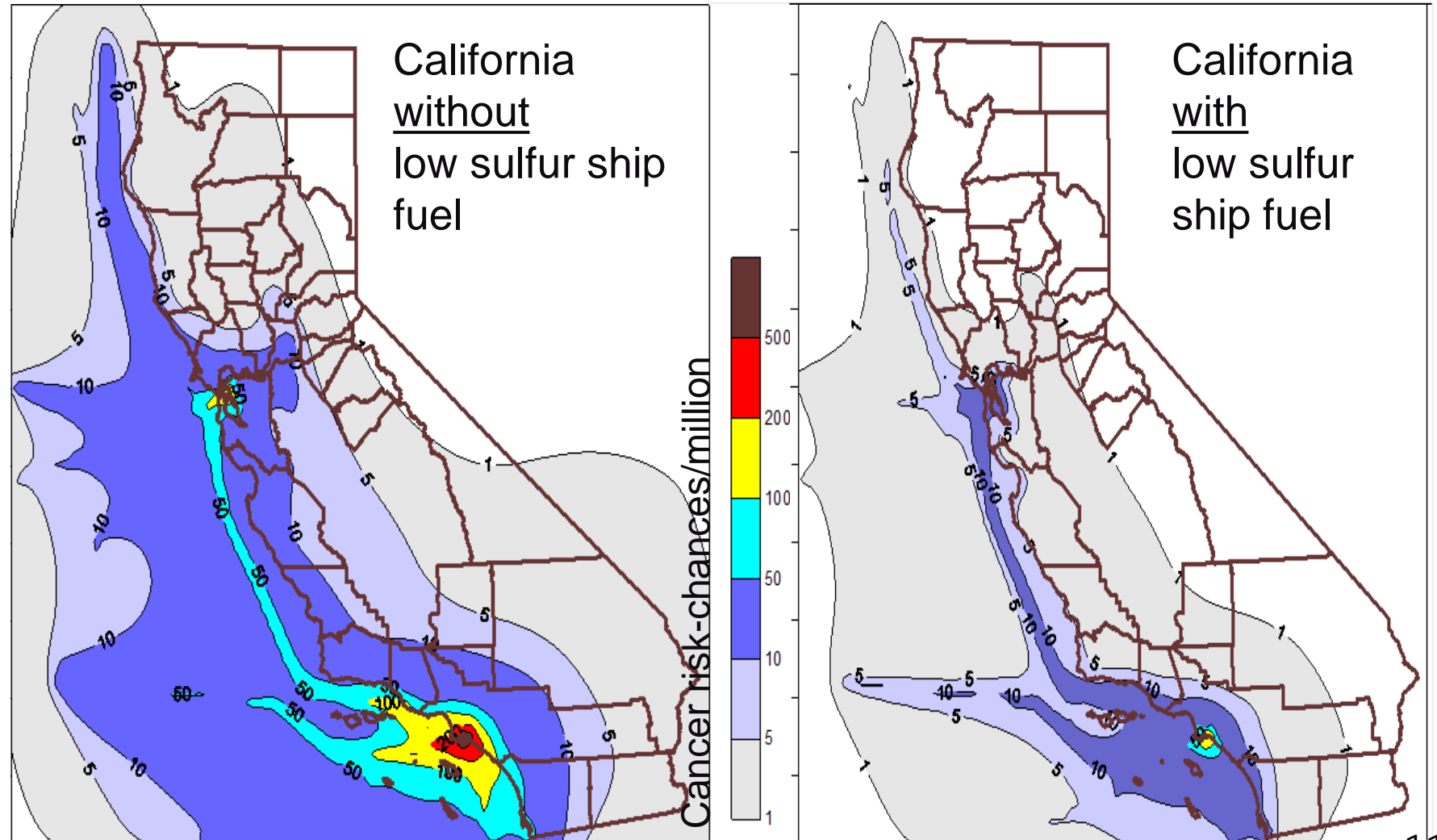


CA Vessel Fuel Rule

- ♦ 2008 CA rule for cleaner fuels within 24 nm zone
- ♦ Main & auxiliary engines, auxiliary boilers
- ♦ Step down in sulfur levels: 2009, 2012, 2014
- ♦ 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



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

Year	% of vessel visits using shore power
2014	50%+
2017	70%+
2020	80%+

Shore power ready in CA:

- 23 terminals/63 berths
- >200 vessels

CA At-Berth Rule

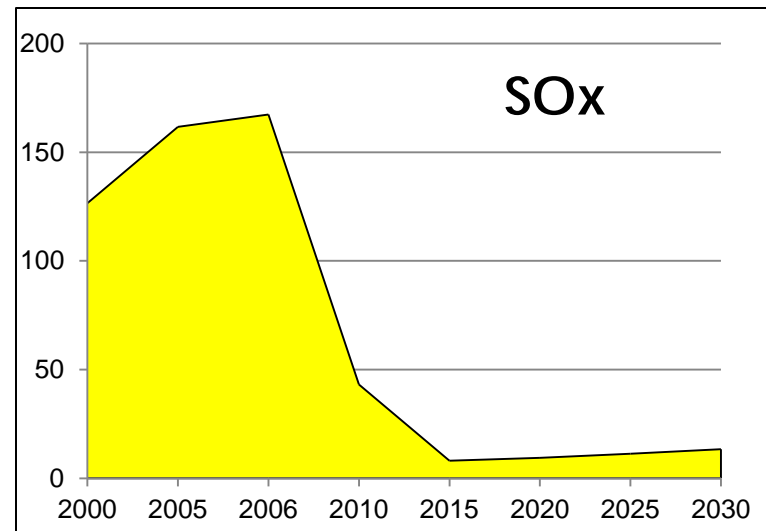
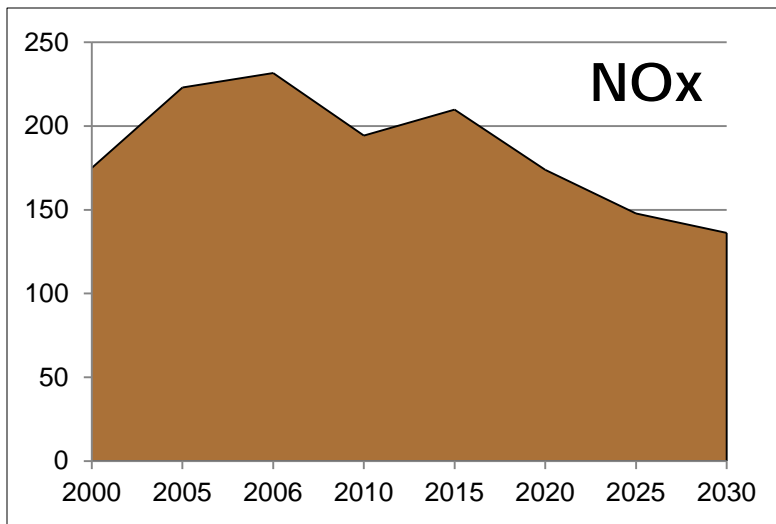
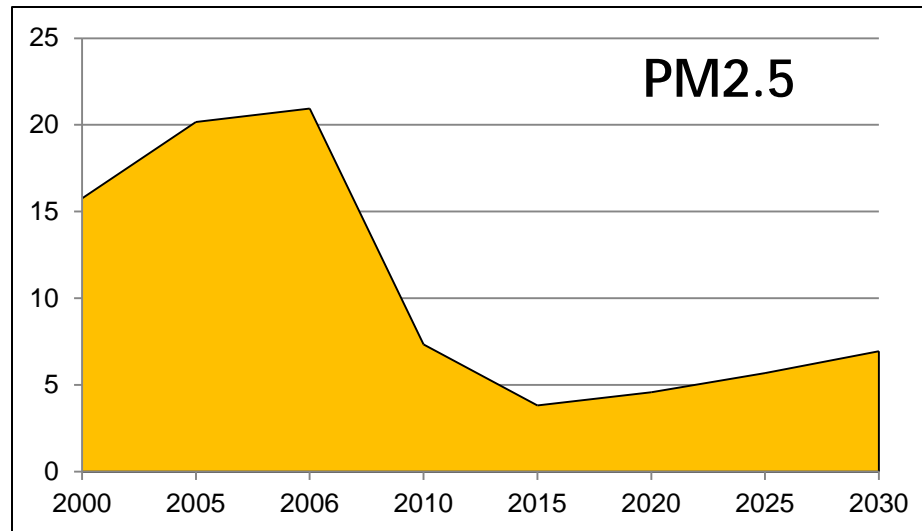
- ◆ Alternative at-berth reduction technologies for compliance are approved
- ◆ 2 barge mounted systems approved for container vessels
- ◆ Room for additional innovative technologies



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



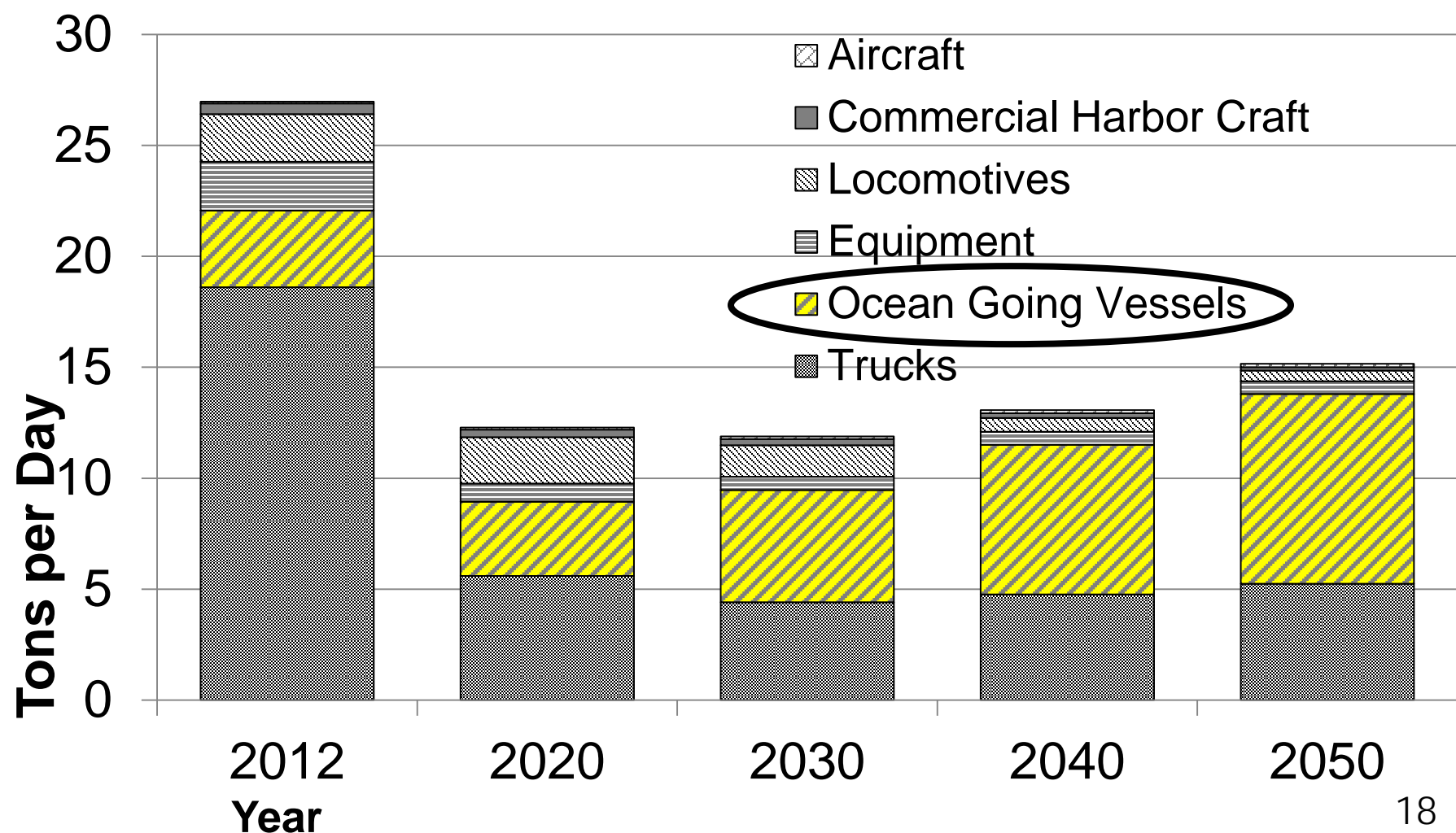
Attain air
quality
standards



Mitigate
climate
change

Zero-emission technology/ renewable energy

Freight PM_{2.5} Emissions in CA



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

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THANK YOU!