



Canada-U.S. Convergence on Environmental Regulation:

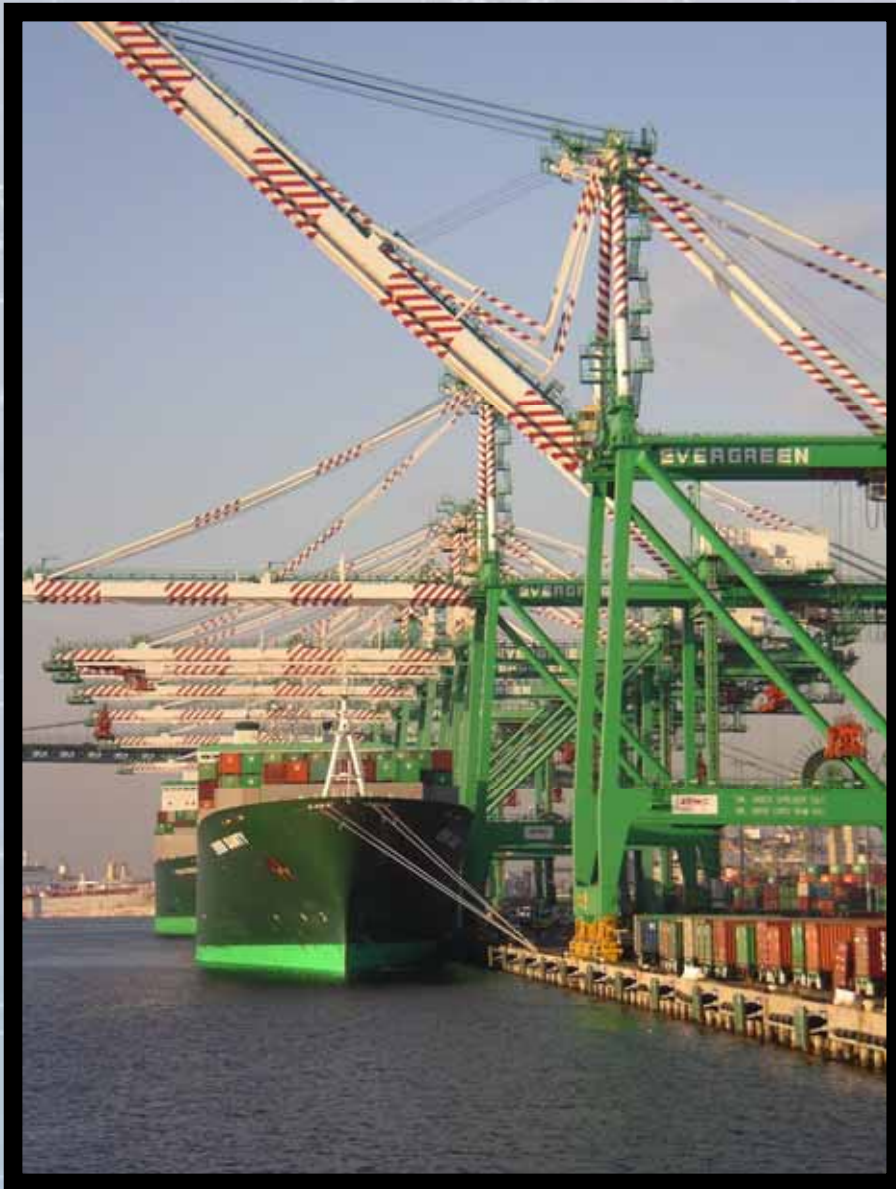
The Case of Marine Vessels Emissions

Presented by:

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PNWIS: November 3-5, 2004

Overview



- Study Area
- Marine Vessel Emissions
- Regulations and Policies
- Convergence
- Options
- Questions

Georgia Basin/Puget Sound

- Border(s)
 - Canada – U.S.
 - Regulatory Regimes
- Air Quality
- Fraser Valley
- Ports

Georgia Coast Cascade Air Basin



Georgia Basin & Puget Sound



Produced by Applied Air Systems, 2007. Modified by Applied Air Systems, June 17, 2008. Produced by Applied Air Systems, 2008.

Georgia Basin/Puget Sound

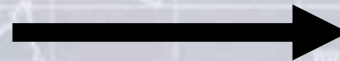


Santa Barbara, CA

Problem

❑ Lower Fraser Valley 2000

- ❑ SO_x = 59%
- ❑ NO_x = 22%
- ❑ PM = 5.6%



❑ Lower Fraser Valley 2025

- ❑ SO_x = ↑ 34%
- ❑ NO_x = ↓ 2%
- ❑ PM = ↑ 39%

- ❑ Economics
- ❑ Jurisdictions
- ❑ Port Calls



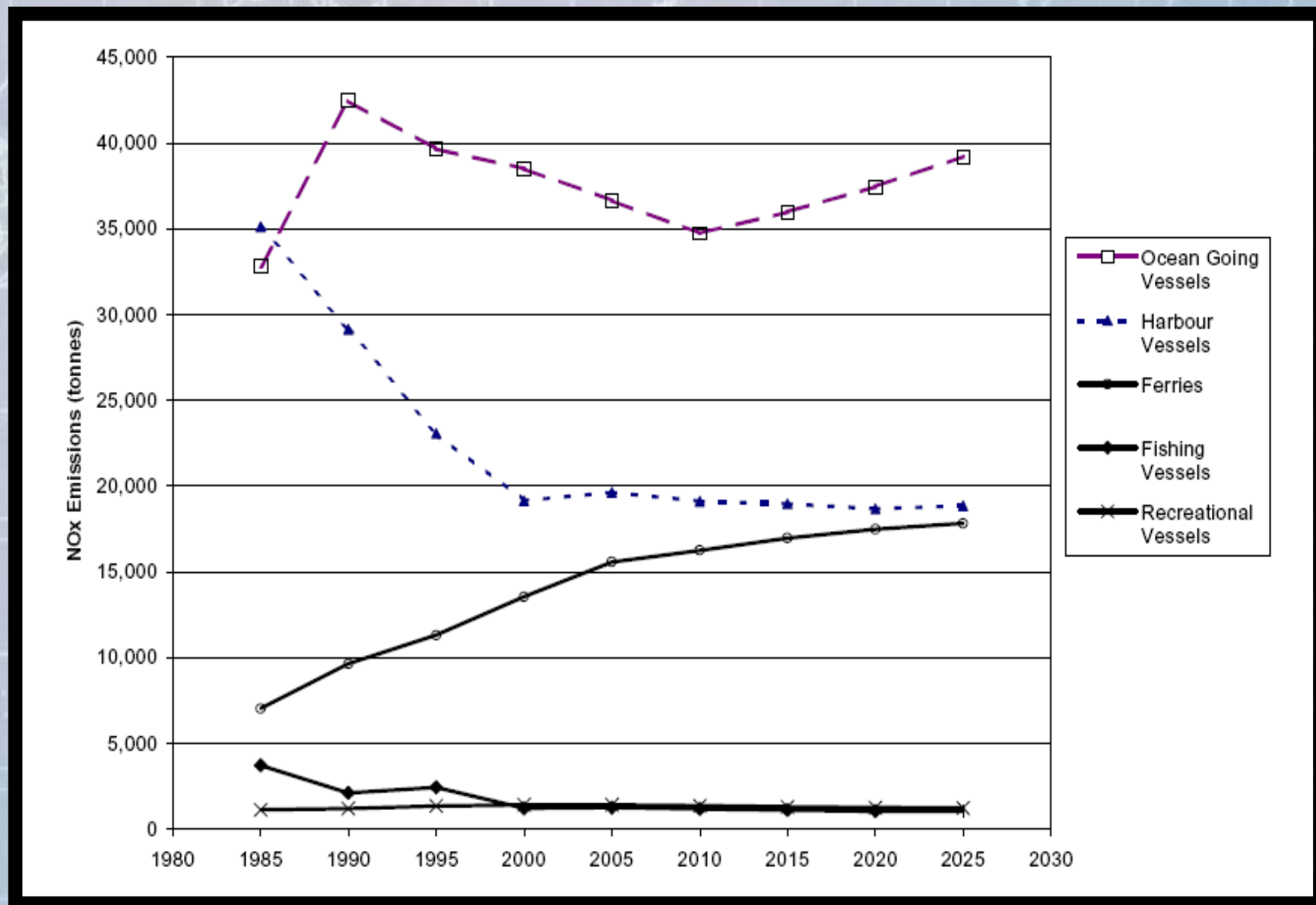


Port of Los Angeles, CA

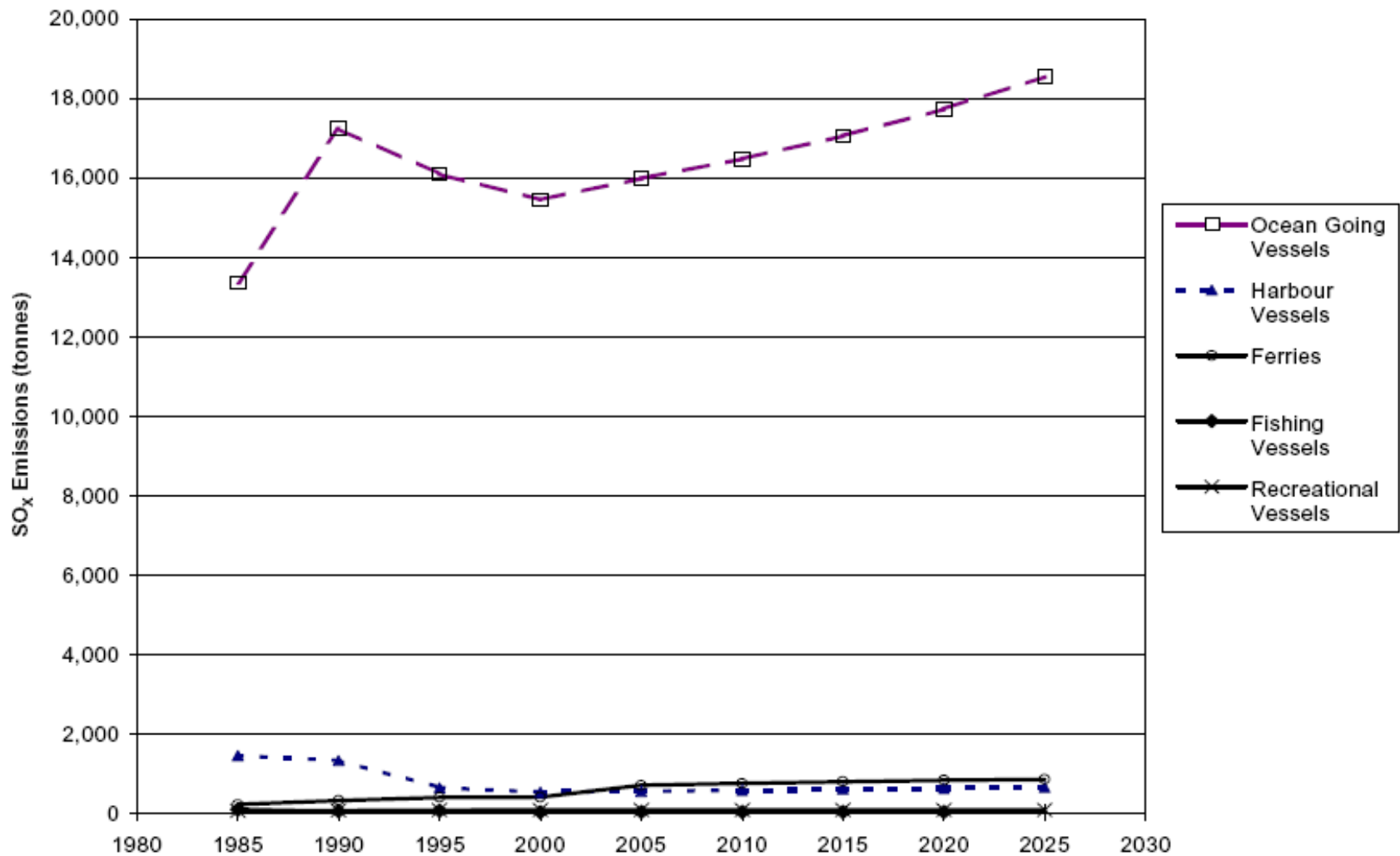


Port of Shanghai, China

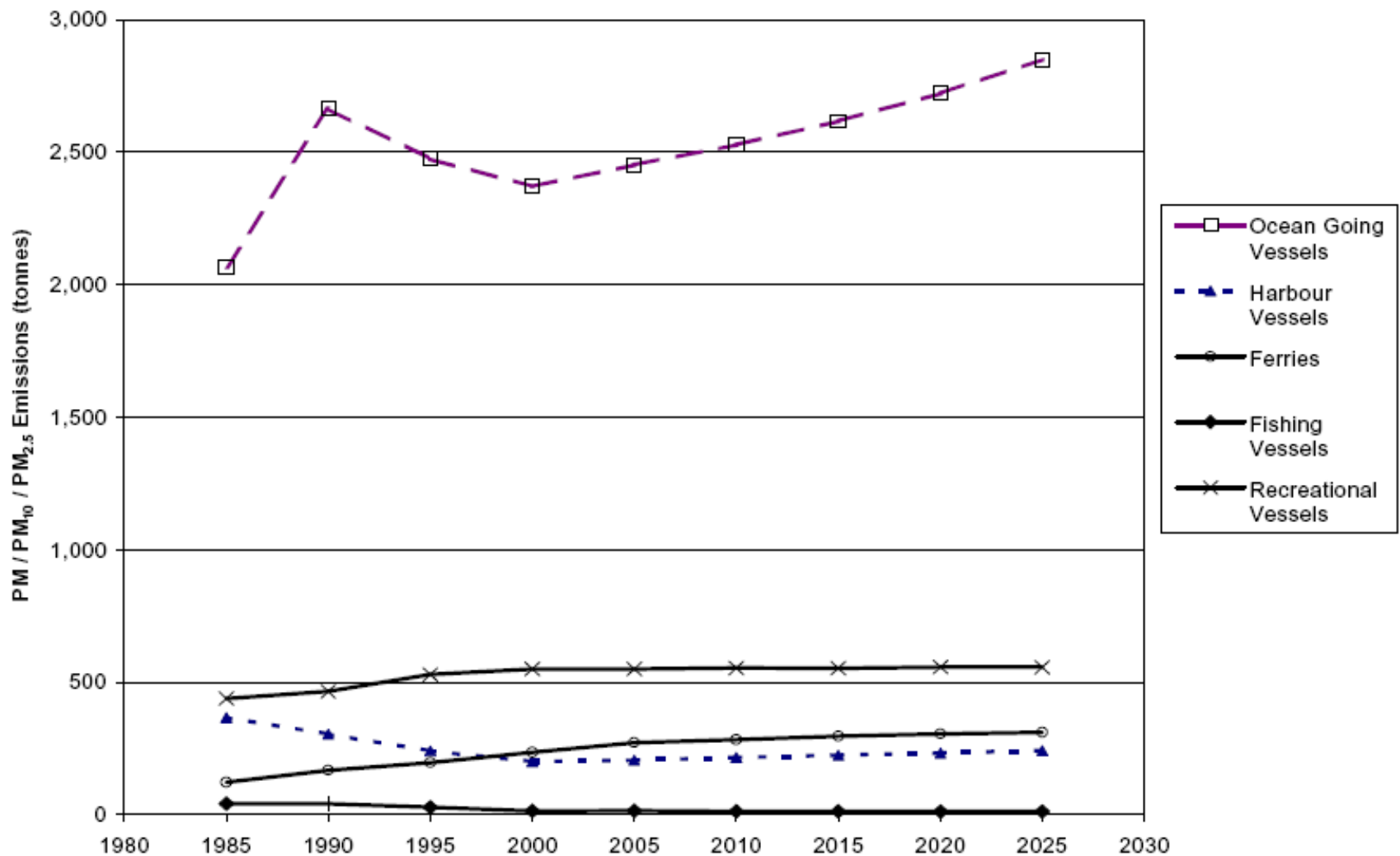
Air Pollution - NOx



Air Pollution - SOx



Air Pollution - PMx



Regulations

- ❑ **Canada**
 - ❑ **Environment Canada**
 - ❑ **Transport Canada**
 - ❑ **Province of British Columbia**
 - ❑ **Ministry of Water, Land, and Air Protection**
 - ❑ **Greater Vancouver Regional District**
 - ❑ **Fraser Valley Regional District**



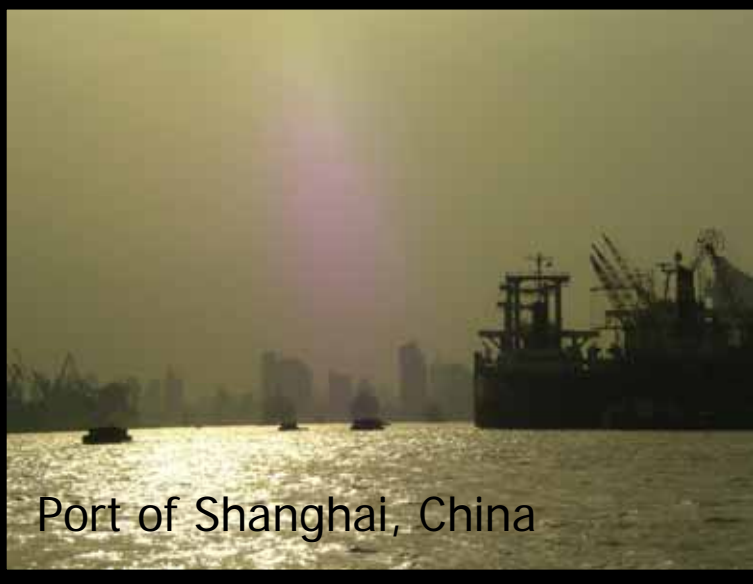
Regulations

- ❑ **United States**
 - ❑ **Environmental Protection Agency**
 - ❑ **Department of Ecology**
 - ❑ **Northwest Clean Air Agency**
 - ❑ **Puget Sound Clean Air Agency**



International Governance

- ❑ International Maritime Organization
- ❑ International Joint Commission
- ❑ Georgia Basin/Puget Sound Int'l Airshed Strategy Committee
- ❑ MOU – (B.C./WA)



Port of Shanghai, China



Port of Los Angeles, CA

Convergence

- ❑ Recognition
- ❑ West Coast Diesel Emissions Reduction Collaborative
- ❑ Georgia Basin/Puget Sound Int'l Airshed Strategy Committee



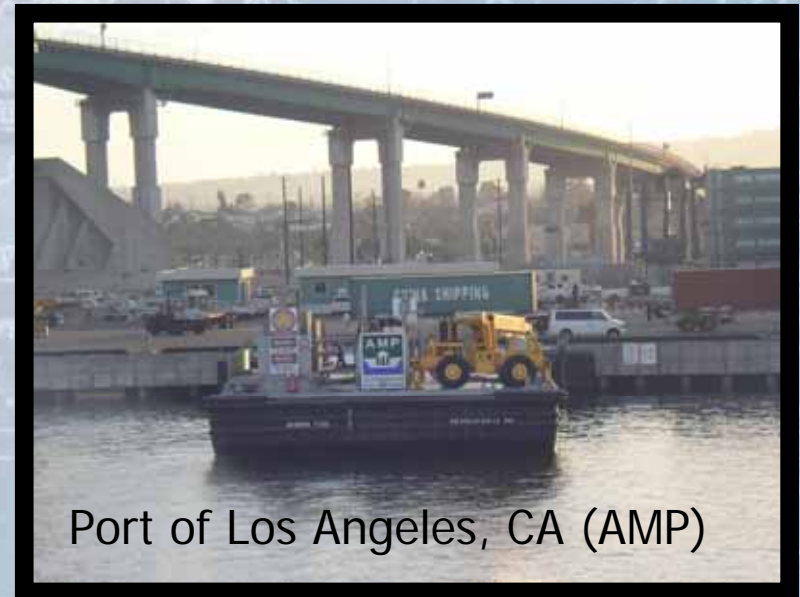
Solutions - Options

Large Scale:

- Int'l Governance Model
- West Coast Model
- Nat'l Regulation Model
- Georgia Basin/Puget Sound Region Approach Model

Small Scale:

- Alternative Marine Power (AMP) - "Cold Ironing"
- Low Sulfur Fuel
- Speed Reduction
- New Engines
- Increase Port Efficiency



Thank You!

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