



Shore Power in California

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California Environmental Protection Agency



Air Resources Board

1

Topics

- **Context**
- **Goods Movement Emission Reduction Plan**
- **Shore Power (Cold-Ironing) Feasibility Report**
- **Shore Power Regulation**
- **Status**
- **Next Steps**

2

Context

- ◆ **Related Activities**

- Diesel Risk Reduction Program
- Goods Movement Emission Reduction Plan
- Climate Change Program (AB 32)
- San Pedro Bay Ports Clean Air Action Plan

- ◆ **Shore Power (Cold-Ironing) Feasibility Report**

- ◆ **Regulation to Reduce Hotelling Emissions**

3

Goods Movement Emission Reduction Plan

- ◆ **Approved by Board April 2006**

- ◆ **Emission Reduction Strategies Identified for:**

- Ships
- Commercial harbor craft
- Cargo handling equipment
- Trucks
- Locomotives

4

Goods Movement Emission Reduction Plan (Continued)

• Strategies for Ships

- Ship auxiliary engine fuel (adopted)
- Cleaner fuels for main engines
- Expanded vessel speed reduction program
- Cleaner engines
- Shore power

5

Goods Movement Emission Reduction Plan (Continued)

• Goals of Shore-Based Electrical Power Measure for Ocean-Going Vessels

- Shore power for 20% of visits by 2010
- Shore power for 60% of visits by 2015
- Shore power for 80% of visits by 2020

• Goals of Shore-Based Electrical Power for Harbor Craft

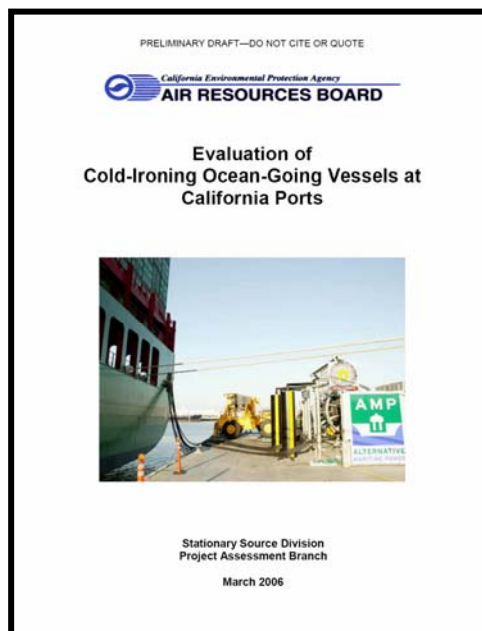
- 30% reduction in fuel use by 2025

6

Draft Cold-Ironing Feasibility Report

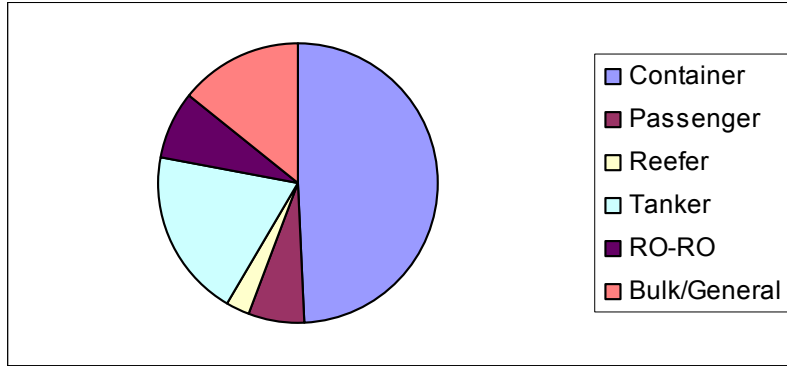
- Released March 2006
- Analyzed Cost-Effectiveness, by Ship Category and Port
- Requested 30-Day Comment Period

7



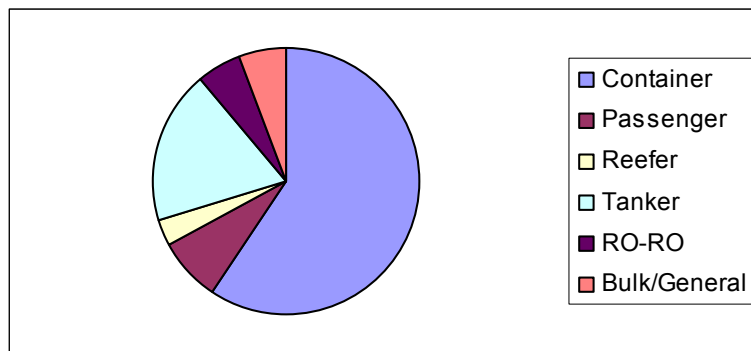
8

Ship Calls to California Ports, 2004



9

Ship Calls by Ships Making 3 or More Visits, 2004



10

Conclusions

- **Shore Power Can Be a Useful Tool for Reducing Hotelling Emissions**
- **Key Parameters for Cost Effectiveness**
 - frequency of visits
 - berthing times
 - power requirements
- **Will Require Significant Infrastructure Investments**

11

Ocean-Going Vessel Categories Considered for Shore Power

- **Container Ships**
- **Passenger Ships**
- **Refrigerated Cargo Ships**
- **Potentially Some Bulk Ships**



12

Ocean-Going Vessel Categories Considered for Alternative Techniques

- **Bulk Vessels**
- **General Cargo Vessels**
- **Ro-Ro Vessels**
- **Tankers**

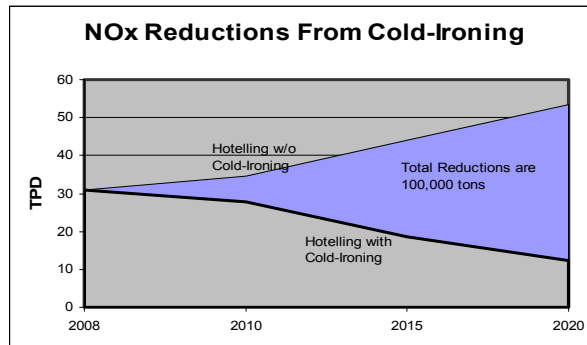
13

California Ports Affected

- **Most Cost-Effective for Container Ships,
Passenger Ships, and Refrigerated Cargo Ships**
- **Prime Candidate Ports: Los Angeles,
Long Beach, Oakland, San Diego, San Francisco,
and Hueneme**
- **Two-Thirds of Capital Costs and Benefits at
Los Angeles/Long Beach**

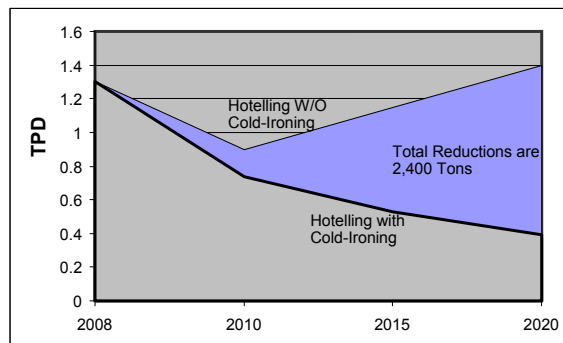
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NOx Emission Benefits from Shore Power



* Based on 20%, 60%, and 80% shore power targets

PM Emission Benefits from Shore Power



* Based on 20%, 60%, and 80% shore power targets

Challenges

- **Fleet Turnover**
- **Standardized Electrical Connections**
- **Electricity Infrastructure, Rates, and Availability**
- **Identifying Alternative Approaches**

17

Future Cost Effectiveness

- **Increased Berth Utilization**
- **Less Expensive Average Electricity with Increased Usage**
- **Shore Power Capability in New Ships**

18

West Coast Shore Power

- **Juneau, AK – Princess Cruise Lines**
- **Seattle, WA – Princess Cruise Lines, Holland America**
- **Port of LA – China Shipping**
- **Port of LB – BP Petroleum**
- **Various Ports – U.S. Navy**

19

Status of Current Activities

- **Gathering and Analyzing Data**
 - Berthing data for 2003-2005 for select ports
- **Working with Utilities**
 - Infrastructure costs
 - Electricity costs
 - Power availability

20

Status of Current Activities (Continued)

- **Meetings with Stakeholders**

- Ports
- Pacific Maritime Shipping Association
- Other Carriers
- Utilities

- **Bimonthly Workgroup Meetings**

- January
- March
- May

21

2007 Regulatory Timetable

- **Workshop Late Summer**
- **Proposed Regulation and Staff Report Released Late September**
- **Present Regulation to Board for Consideration in November**

22

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Shore Power:
www.arb.ca.gov/ports/shorepower/shorepower.htm
Goods Movement Emission Reduction Plan:
www.arb.ca.gov/planning/gmerp/gmerp.htm

