



# Shore Power in California

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California Environmental Protection Agency



Air Resources Board

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## Topics

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

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# Context

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- ◆ **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**

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# Goods Movement Emission Reduction Plan

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- ◆ **Approved by Board April 2006**

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

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

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## **Goods Movement Emission Reduction Plan (Continued)**

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### **• Strategies for Ships**

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

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## **Goods Movement Emission Reduction Plan (Continued)**

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### **• 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

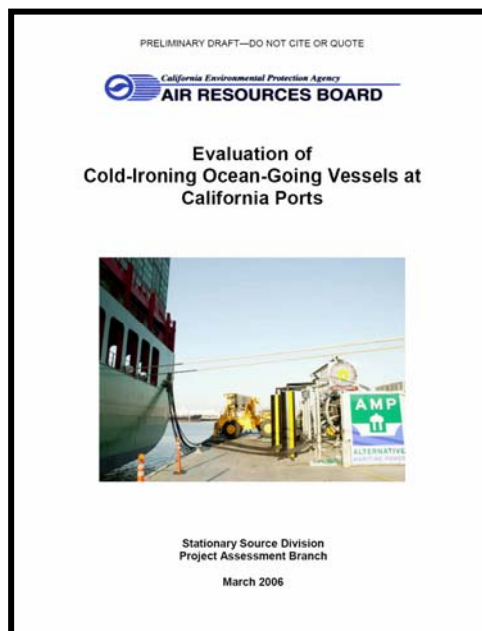
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# Draft Cold-Ironing Feasibility Report

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

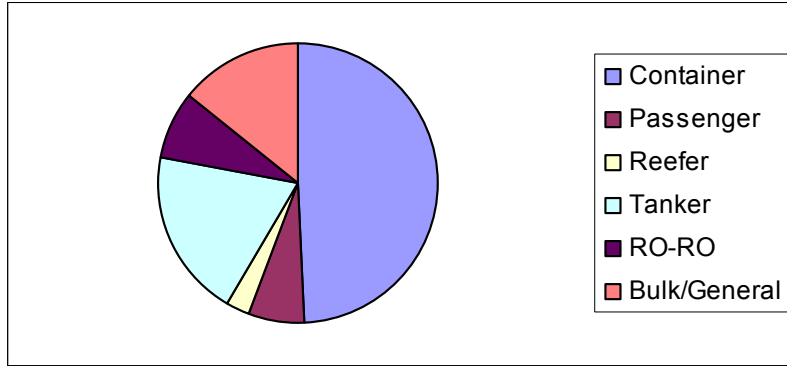
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## Ship Calls to California Ports, 2004

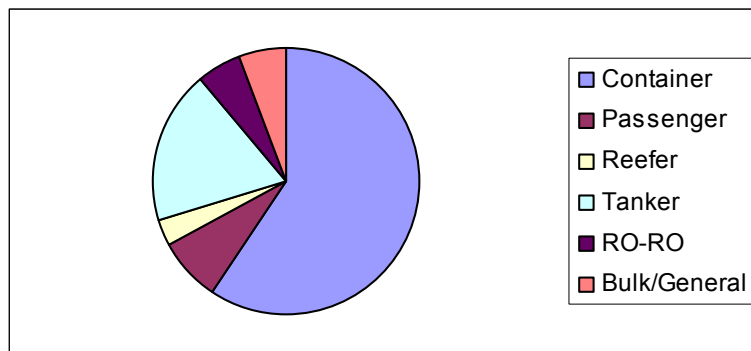
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## Ship Calls by Ships Making 3 or More Visits, 2004

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# Conclusions

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- **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**

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# Ocean-Going Vessel Categories Considered for Shore Power

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



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## **Ocean-Going Vessel Categories Considered for Alternative Techniques**

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

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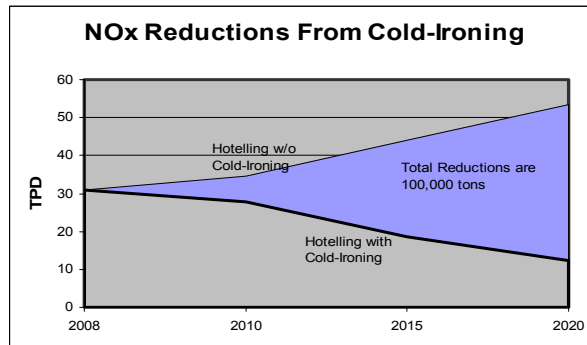
## **California Ports Affected**

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- **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**

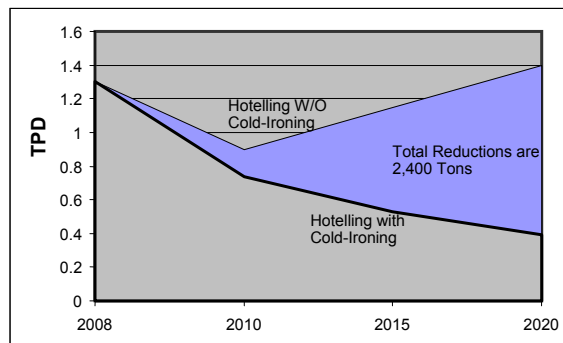
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# NOx Emission Benefits from Shore Power



\* 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**

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

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## **Future Cost Effectiveness**

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

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## West Coast Shore Power

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- **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**

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## Status of Current Activities

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

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## **Status of Current Activities (Continued)**

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- **Meetings with Stakeholders**

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

- **Bimonthly Workgroup Meetings**

- January
- March
- May

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## **2007 Regulatory Timetable**

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

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# Contacts

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- Webpages:  
**Shore Power:**  
[www.arb.ca.gov/ports/shorepower/shorepower.htm](http://www.arb.ca.gov/ports/shorepower/shorepower.htm)  
**Goods Movement Emission Reduction Plan:**  
[www.arb.ca.gov/planning/gmerp/gmerp.htm](http://www.arb.ca.gov/planning/gmerp/gmerp.htm)

