2010 Emissions Inventory

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2010 inventory shows

• On track or ahead of schedule in meeting clean air goals

• Diesel emissions reduced 72% -- four years ahead of schedule
Strategies working

• Clean Air Action Plan has greatly reduced air pollution

• Port programs augmented by state regulations
Port activities 2005 v. ’10

• Container cargo volume down 7%
• Total ship calls declined 18%
• Container ship calls down 10%
• Number of cargo containers (TEUs*) per ship call up 3%

*Twenty-foot equivalent units
CAAP Initiatives

• Green Flag Vessel Speed Reduction Program

• Shore Power

• Clean Trucks Program
Sources of Diesel Emissions*

- Ships: 64%
- Harbor craft: 13%
- Trains: 8%
- Trucks: 8%
- Cargo handling equipment: 7%

*Diesel Particulate Matter

www.polb.com/100years
Sources of Sulfur Oxides (SOx)

- Ships: 99%
- Others: 1%

www.polb.com/100years
Sources of Nitrogen Oxides (NOx)

- Cargo handling equipment: 8%
- Ships: 59%
- Trucks: 14%
- Trains: 9%
- Harbor craft: 10%
Sources of Greenhouse Gases*

- **Ships**: 40%
- **Trucks**: 36%
- **Cargo handling equipment**: 12%
- **Trains**: 6%
- **Harbor craft**: 6%

*Carbon Dioxide Equivalent
Reduced ship emissions

- Green Flag Program
- State Vessel Low-Sulfur Fuel Regulation
- Cleaner Ships
- Shore Power
Vessel emissions

- Diesel PM down 72%
- SO$_x$ cut 72%
- NO$_x$ reduced 26%
- Greenhouse Gases declined 15%
Reduced truck emissions

- Age of trucks: 2.2 years old in 2010 vs. 11.2 years old in 2005
- 46% reduction in truck idling hours
- 28% decrease for truck vehicles miles traveled
Truck emissions

- Diesel PM reduced 90%
- NO\textsubscript{x} cut 78%
- SO\textsubscript{x} down 92%
- Greenhouse Gases decreased 28%
Shift from trucks to trains

• On-dock rail shipments increased to 25% in 2010

• In 2005, 16% of cargo shipments moved by on-dock rail
Reduced rail emissions

- Diesel PM cut 49%
- NO\textsubscript{x} down 43%
- SO\textsubscript{x} reduced 93%
- Greenhouse Gases declined 27%
Cargo-Handling Equipment

- State regulation
- Newer equipment or level 3 retrofit
- More equipment with cleaner, on-road engines
Reduced equipment emissions

- Diesel PM declined 48%
- NO\textsubscript{x} cut 38%
- SO\textsubscript{x} decreased 89%
- Greenhouse Gases down 2%
Harbor Craft

- State regulation
- Newer, cleaner engines
- Better data collection
• Diesel PM down 22%
• NO\textsubscript{x} down 24%
• SO\textsubscript{x} down 89%
• Greenhouse Gases down 3%
All emissions reduced

**Diesel PM 72%**
- 2014 CAAP goal: 72%

**NOx 46%**
- Goal: 22%

**SOx 73%**
- Goal: 93%

**Greenhouse Gases 18%**
Looking ahead

• Clean Air Action Plan
  – Clean Trucks Program
  – Green Flag Program
  – Technology Advancement Program

• Green Leases

• CARB Regulations
  – Cargo-Handling Equipment
  – Harbor Craft
  – Ocean-Going Vessels
Summary

• Diesel PM down 72%

• Smog-forming emissions down 46%

• Programs are working