



Clean Fuels Program Advisory Group Meeting



February 8, 2012



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Technology Advancement Office



Cleaning the Air That We Breathe...

2011 AQMD Priorities

1. Commence demonstration/deployment of a zero-emission cargo container movement system.
2. Incentivize five megawatts of in-basin renewable distributed electricity generation and storage to support electric technology applications.
3. Make substantial progress in creating programs to facilitate construction of new and modified stationary sources in areas where the supply of emissions offsets is limited, consistent with AQMD's clean air objectives.

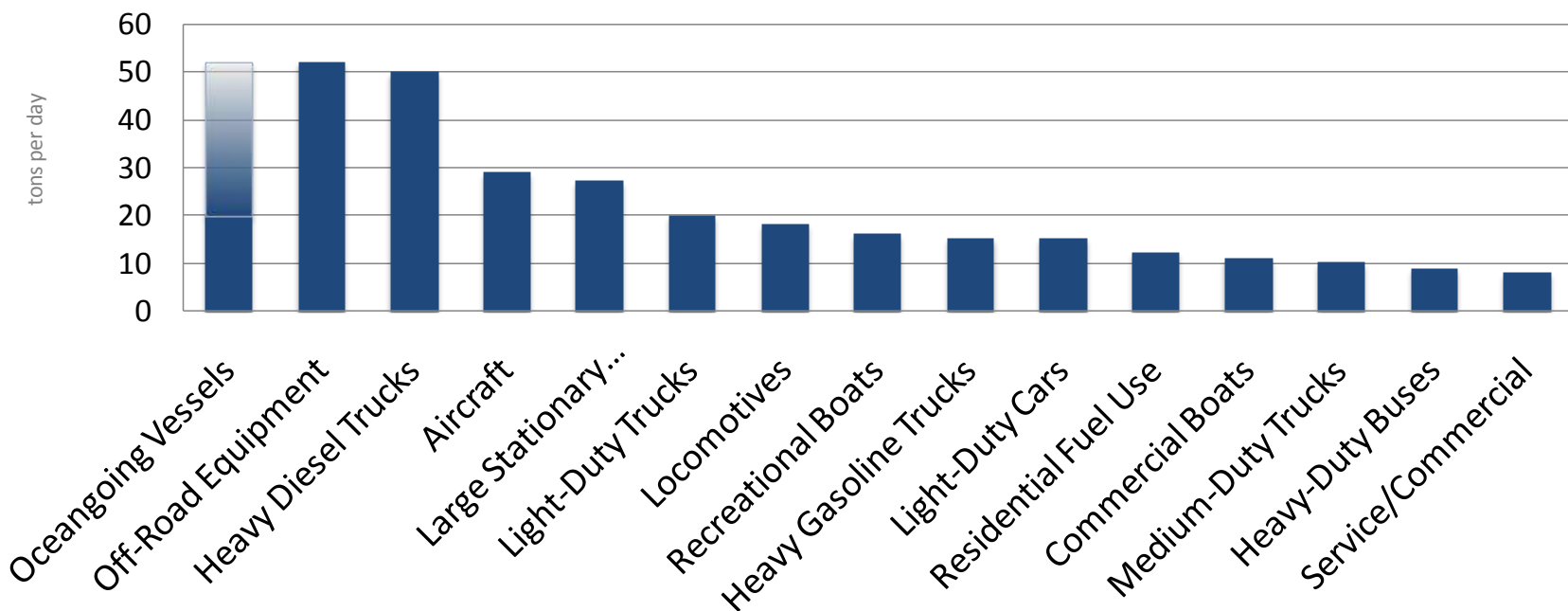
Key Regional Air Quality Challenge: Reducing Nitrogen Oxides from Mobile Sources

- Attaining federal ozone and PM_{2.5} standards will require substantial NO_x reductions *beyond adopted rules*
- Ozone standard will likely require the greatest reductions
 - Attainment Deadlines:
 - **2023** (80 ppb standard)
 - **2032 (?) timeframe** (75 ppb standard)



South Coast Air Basin

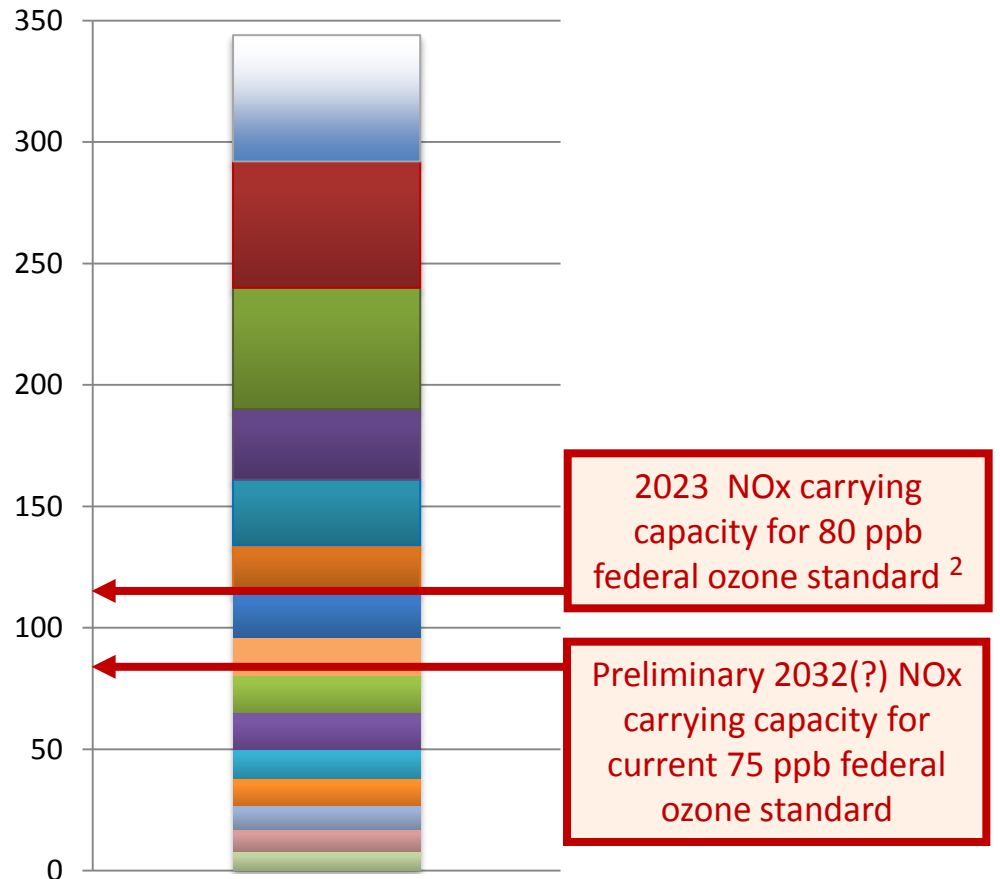
Top 15 NO_x Categories: 2023 NO_x Emissions With Adopted Rules Preliminary SCAQMD Estimates*



* Preliminary emissions estimates based on data updated from 2007 AQMP where available; CARB 2010 emissions projections for trucks and off-road equipment; IMO Tier 1 – 3 for ocean vessels; EPA 2008 rule for locomotives; 2007 AQMP short-term measures for other categories. Range for oceangoing vessels based on varying deployment assumptions for IMO Tier 2 and 3 vessels and range of ports' cargo forecasts.

Top 15 NO_x Categories: 2023 NO_x Emissions With Adopted Rules Preliminary SCAQMD Estimates¹

- Oceangoing Vessels
- Off-Road Eq^t
- Heavy Duty Diesel Trucks
- Aircraft
- Large Stationary
- Light Duty Trucks
- Locomotives
- Recreational Boats
- Heavy Duty Gasoline Trucks
- Light Duty Cars
- Residential Fuel Combustion
- Commercial Boats
- Medium Duty Trucks
- Heavy Duty Buses
- Service/Commercial



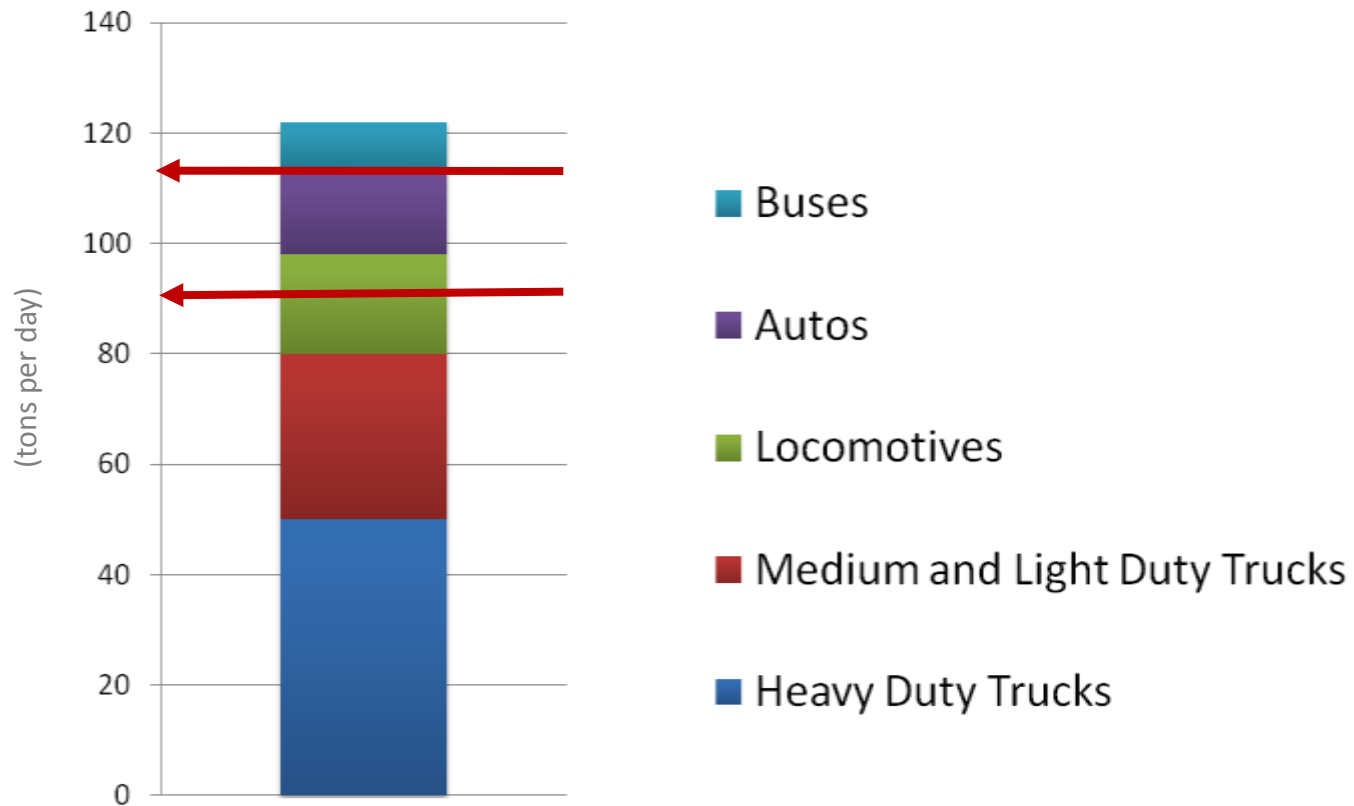
1 Preliminary emissions estimates based on data updated from 2007 AQMP where available: CARB 2010 emissions projections for trucks and off-road equipment; IMO Tier 1 – 3 for ocean vessels; EPA 2008 rule for locomotives; 2007 AQMP short-term measures for other categories. Range for oceangoing vessels (20 -52) based on varying deployment assumptions for IMO Tier 2 and 3 vessels and range of ports' cargo forecasts.

2. 1997 80 ppb federal ambient ozone standard. Source: 2007 AQMP.

South Coast Air Basin

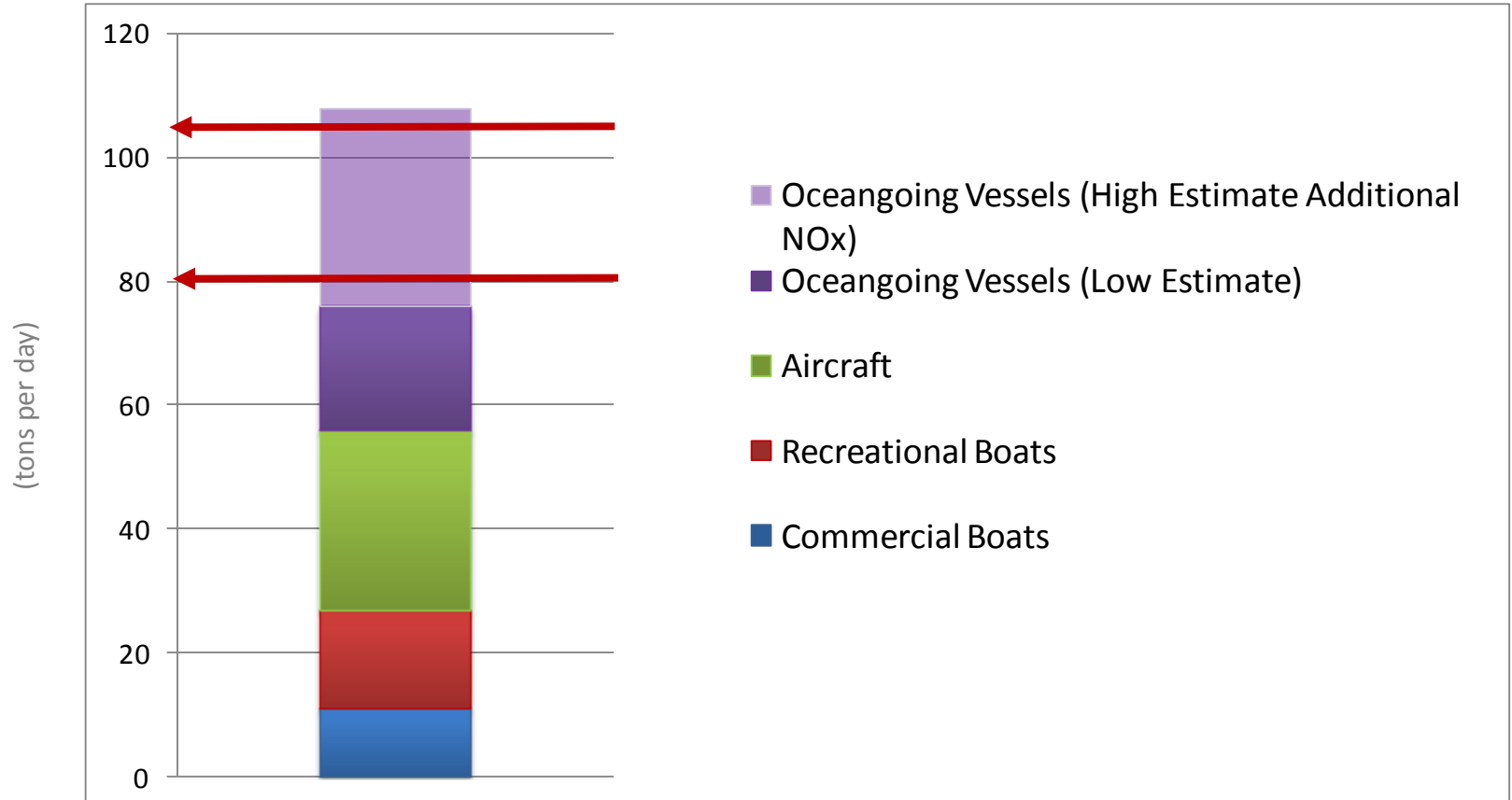
Landside Transportation Sources

2023 NO_x Emissions
With Rules Adopted (Preliminary Estimates)¹



1. Preliminary emissions estimates based on data updated from 2007 AQMP where available; EPA 2008 locomotive rule; updated 2010 CARB truck emissions data.

South Coast Air Basin
Marine & Aviation Sources
2023 NO_x Emissions
With Adopted Rules (Preliminary Estimates) ¹



¹ Preliminary emissions estimates based on data updated from 2007 AQMP where available: IMO Tier 1 – 3 for ocean vessels; EPA 2008 rule for locomotives; 2007 AQMP short-term measures for other categories. Range for oceangoing vessels based on varying deployment assumptions for IMO Tier 2 and 3 vessels and range of ports' cargo forecasts.

September 28-29, 2011

Air Quality Technology Symposium

- Discuss and Identify Potential Technologies and Control Strategies for 2012 AQMP
- Technology Areas
 - On-Road
 - Goods Movement
 - Off-Road
 - Stationary

September 28-29, 2011

Air Quality Technology Symposium

- Partners
 - Government
 - Industry
 - Environmental Organizations
 - Public
 - Universities

AQMP Control Measures

- Consumer Products
 - VOC Emissions
- Combustion Sources
 - NO_x Emissions
- Particulate Matter Sources
 - Fugitive dust, construction, combustion
- Mobile Sources
 - On-road
 - Of-road

AQMP Control Measures

- Mobile Source On-Road
 - Alternative fuels; NO_x, PM
 - Heavy-Duty Vehicles In-Use Emissions; NO_x, PM
 - Goods Movement Activities; NO_x, PM
 - Hybridization; NO_x, PM
 - Fuel Cells; NO_x, PM
 - Electification; NO_x, PM

AQMP Control Measures

- Mobile Source Off-Road
 - Tier 4 Construction Equipment and Locomotives; NO_x, PM
 - Marine Vessel Controls; NO_x, PM
 - Lawn and Garden Equipment; NO_x, PM
 - Hybridization; NO_x and PM
 - Electrification; NO_x and PM
 - Fuel Cells; NO_x and PM

Clean Fuels Program Project Categories

- Fuels and Fueling Infrastructure
- Emissions Control Technologies
- Electric and Hybrid Technologies
- Engine Systems
- Hydrogen and Fuel Cell Technologies
- Stationary Sources

Clean Fuels Program Technologies

Near-Term

- Aftertreatment
- Emulsified Diesel
- HD Natural Gas Engines
- Natural Gas Fueling Infrastructure
- Advanced Diesel Engines
- Hybrid Vehicles (Plug-in & Hydraulic)
- Gas to Liquid Fuel
- Renewables/Biofuels
- H2 Technologies & Refueling
- Fuel Cell Vehicles



Longer-Term