



## Session 3

# Heavy-Duty Introduction

February 2, 2011



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**Mobile Source Division**

# Off-Road Showcase Program

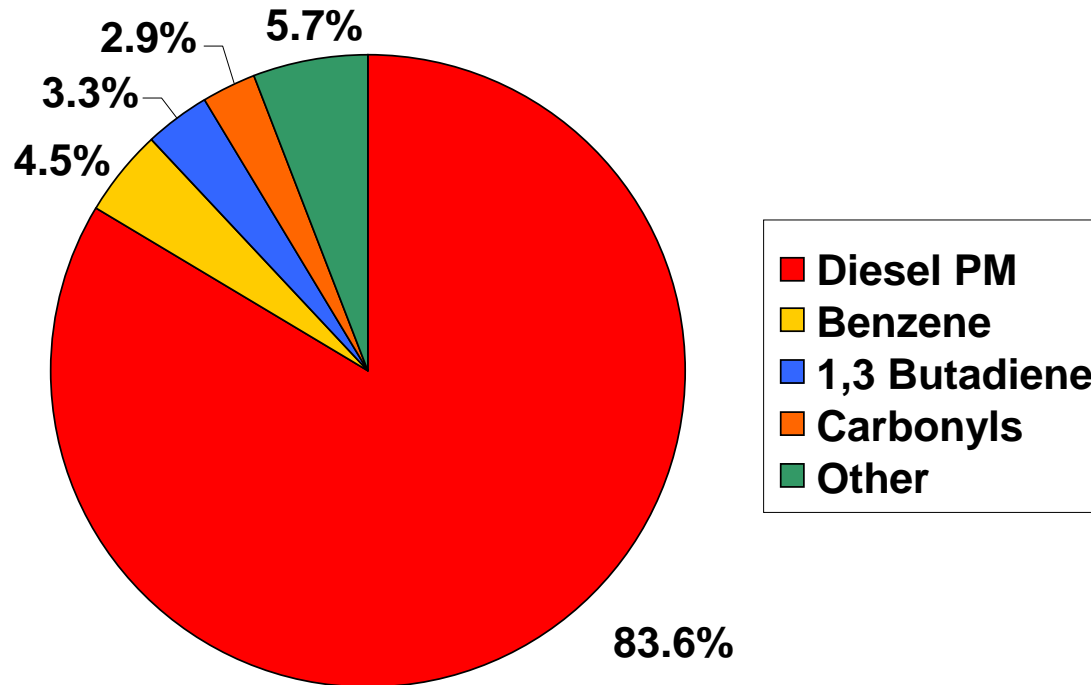
- AQMD, MSRC, and CARB sponsored program to demonstrate off-road vehicle PM and NOx retrofits.
- In 2006 program was approved with ~ \$5 million to retrofit 230 vehicles with 30 control devices.
- Currently 50 vehicles equipped with 14 control devices operating.
- Approximately 50 more vehicles assigned equipment.
- MSRC issued Showcase II Announcement to solicit participation of additional fleets and equipment vendors.

# Heavy-Duty Mobile Sources

- Most are powered by diesel engines
- Diesel PM is an air toxic
  - Largest contributor to overall air toxics risk in basin
- Significant source of NO<sub>x</sub> emissions
  - Control of NO<sub>x</sub> emissions one of the largest remaining challenges in attaining PM and Ozone standards

# Diesel PM Contributes Most to Air Toxics Risk

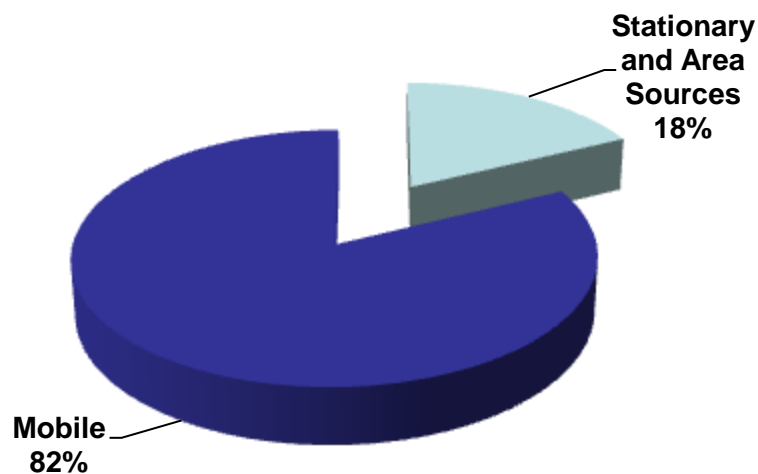
MATES III Basinwide Risk



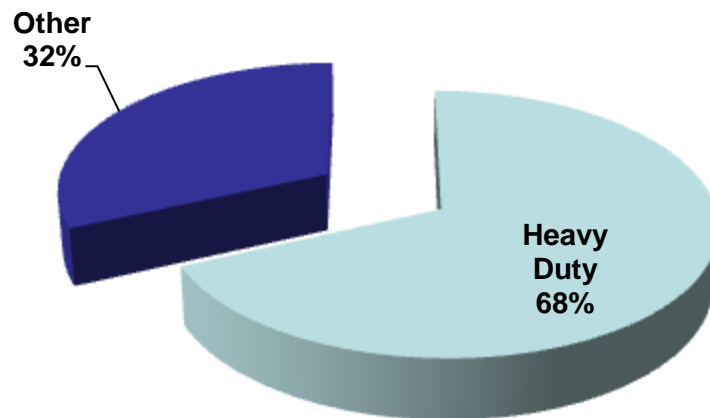
Basinwide Risk: 1194 Per Million  
Based on Average at Fixed Monitoring Sites

# Major Fraction of NO<sub>x</sub> Emissions are from Heavy Duty Sources

2023 NO<sub>x</sub> Emissions



Mobile Sources 2023 NO<sub>x</sub> Emissions

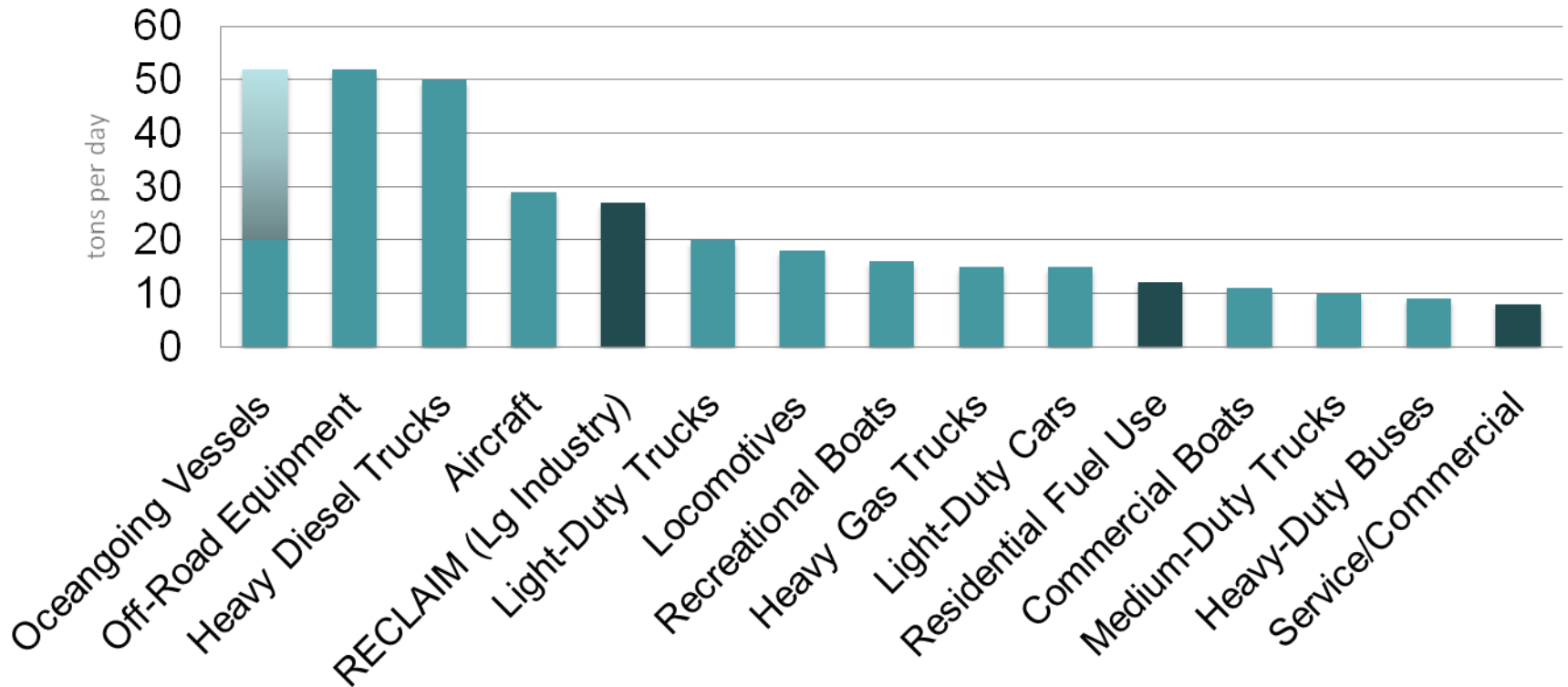


# South Coast Air Basin

## Top 15 NO<sub>x</sub> Categories: 2023 NO<sub>x</sub> Emissions

### With Rules Adopted Through December 2010

### 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.

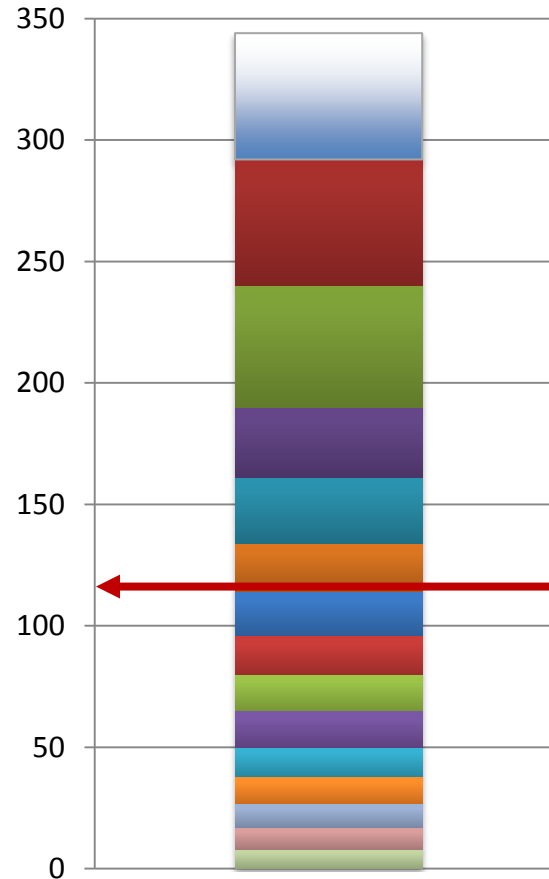
# South Coast Air Basin

## Top 15 NO<sub>x</sub> Categories: 2023 NO<sub>x</sub> Emissions

With Rules Adopted Through December 2010

Preliminary SCAQMD Estimates<sup>1</sup>

- Oceangoing Vessels
- Off-Road Eq<sup>t</sup>
- 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



Region's 2023 NO<sub>x</sub> carrying capacity for federal ozone standard<sup>2</sup>

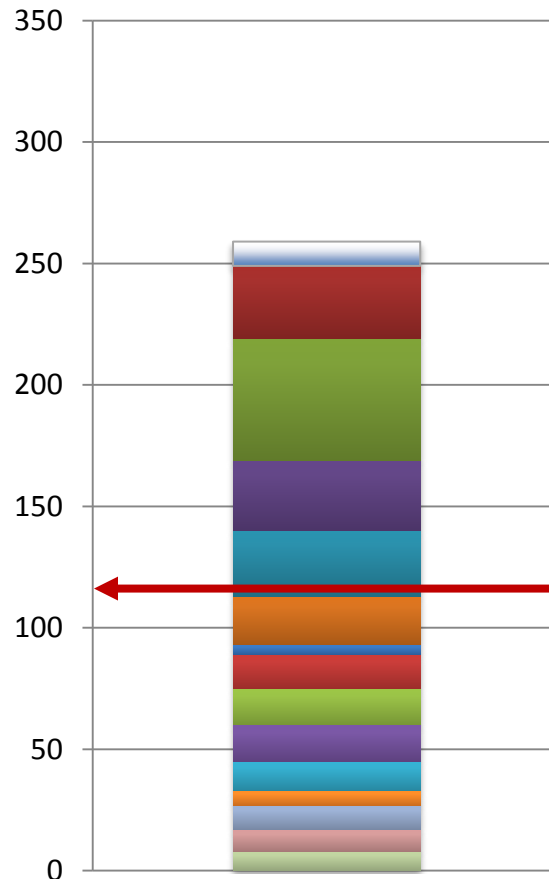
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2. 1997 80 ppb federal ambient ozone standard. Source: 2007 AQMP. Current standard is 75 ppb.

# South Coast Air Basin

## Top 15 NO<sub>x</sub> Categories: 2023 NO<sub>x</sub> Emissions With Cleanest Required Engines

- Oceangoing Vessels
- Off-Road Eq<sup>t</sup>
- Heavy Duty Diesel Trucks
- Aircraft
- Large Stationary
- Light Duty Trucks
- Locomotives
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- Heavy Duty Gasoline Trucks
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# Heavy-Duty Emission Technologies

- Near term need diesel PM reduction technology for heavy-duty mobile sources
  - Dave Coel will discuss heavy-duty natural gas engine repower projects
- Longer term need Heavy-Duty zero-emissions technology
  - Joe Impullutti will discuss Zero-emission transit bus projects