

SCAQMD Efforts to Reduce Emissions from Locomotives



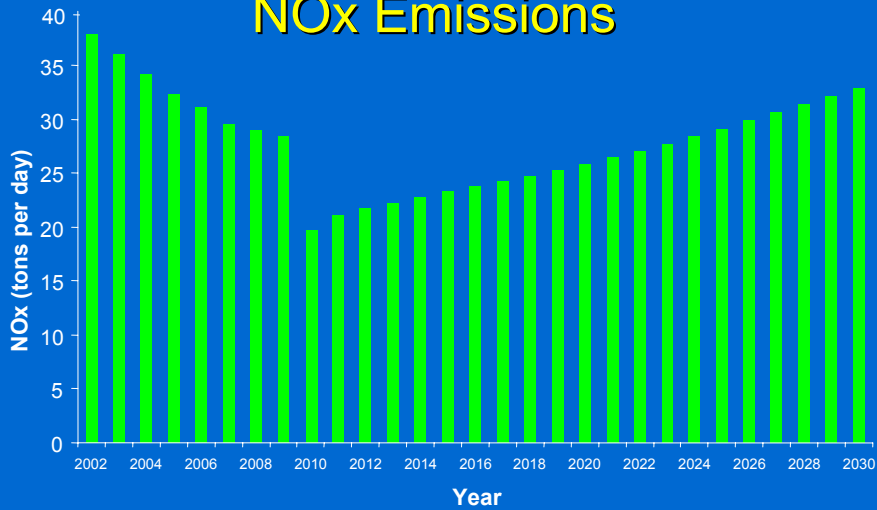
Faster Freight - Cleaner Air California
February 25, 2008

Topics

- Air Quality Impacts of Locomotives
- Recent AQMD Rulemaking Activities
- 2007 SIP Control Measures
- R & D Efforts

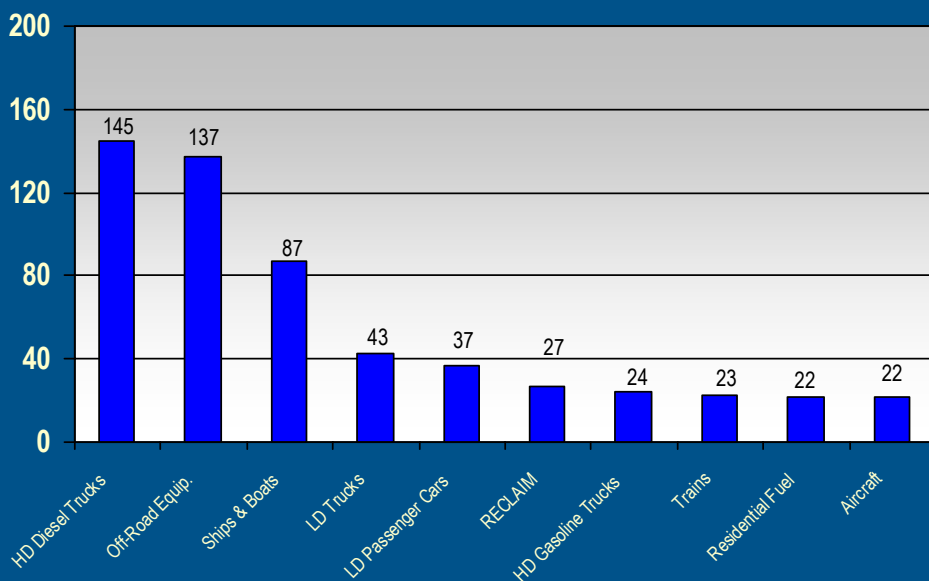


Trend for Locomotive NOx Emissions

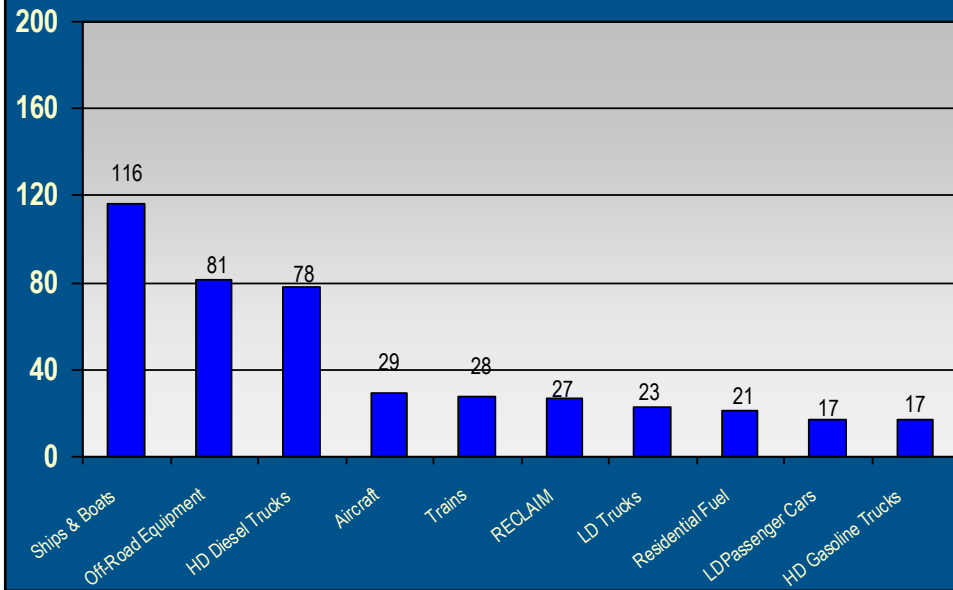


Source: 2007 AQMP, Appendix III

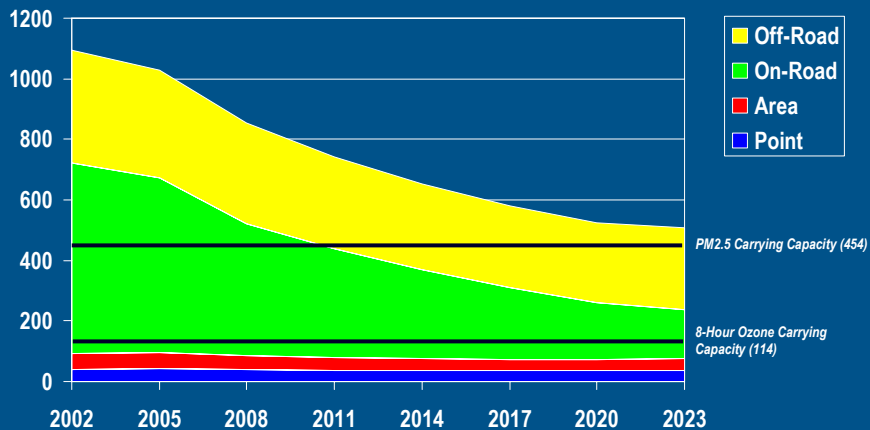
Top Emitters – 2014 NOx



Top Emitters – 2023 NOx



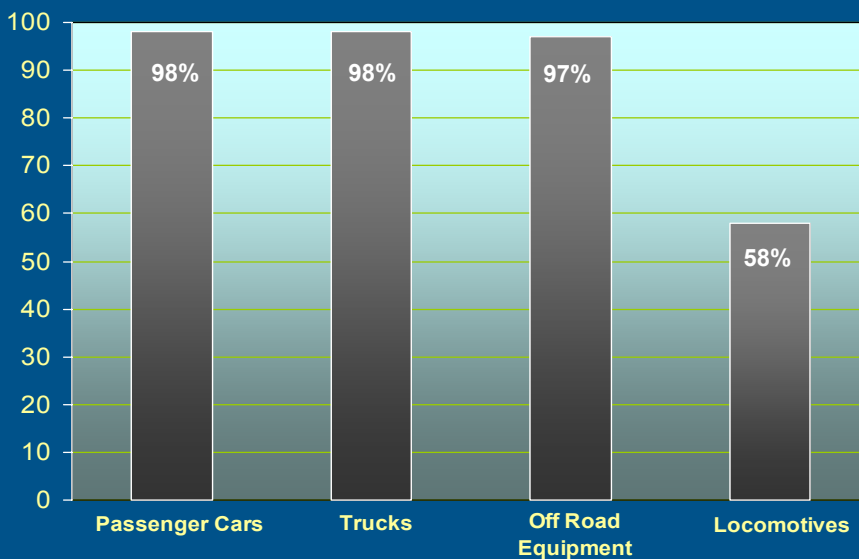
NOx Emissions Trend By Source Category and Carrying Capacity



Localized AQ Impacts

- Railyards and ports are near residential communities
- Recent HRAs confirm substantial risks from railyards
 - Locomotives are significant contributors
- Mitigation measures need to be implemented expeditiously to reduce health risks

Stringency of NOx Rules for New Engines



Recent AQMD Rulemaking Activities

- Regulation 35 – Railroads and Railroad Operations
 - Rule 3501 – Recordkeeping (Feb 2006)
 - Rule 3502 – Idle Control (Feb 2006)
 - Rule 3503 – Inventory and HRAs (Oct 2005)
- Federal Court blocked Reg 35 (Apr 2007)
- AQMD has appealed federal court decision (May 2007)

2007 SIP Control Measures

- Accelerated Introduction of Cleaner Locomotives – 30% Tier 4 by 2014
- Federal Mitigation of Locomotive Emissions – 100% Tier 4 by 2014
- Backstop Measures for Indirect Sources of Emissions from Port and Port-Related Facilities

Backstop Measure

- Achieve emission reductions from port related sources to achieve attainment of ambient air quality standards
- Reduce health risks
- Prevent increases in health risks and criteria pollutant emissions from port projects
- Rulemaking process initiated

Proposed Backstop Rules

- PR 4010
 - Backstop of Port Standards for Non-attainment Pollutants (NO_x, SO_x, and PM)
 - Backstop of Port Standards for Health Risks
- PR 4020
 - Backstop Port Project Standards for New Projects

Demo SCR on Metrolink Passenger Locomotive

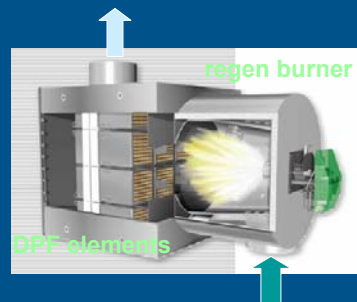
- EMD F59PH locomotive 3200-HP 710-12 engine
- SCR to reduce NOx 85% & PM 50%
- Contractor/Term: Engine, Fuel & Emissions Engineering, Inc./ 24 months



Demo DPF on Pacific Harbor Line (PHL) Switch Locomotive

- MotivePower locomotive 2200-HP MTU engine
- DPF to reduce PM 90%
- Contractor/Term: MIRATEC Corp./ 28 months

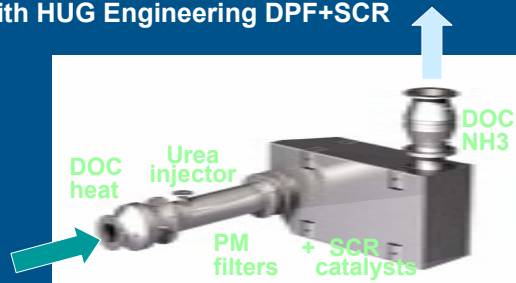
Hug Engineering DPF



Demo DPF+SCR on Metrolink Head End Power (HEP)

- EMD F59PHI locomotive 500-HP Cat 3406
- DPF+SCR to reduce NOx and PM 90%
- Contractor/Term: MIRATEC/ 18 months

silencer replaced with HUG Engineering DPF+SCR



SUMMARY

- Locomotives represent a major and growing source of the emissions inventory
- Reductions from locomotives are critical to address:
 - Localized health impacts
 - Federal PM2.5 AQ Std (2015) and Ozone AQ Std (2024)