CALIFORNIA TIER 4 REGULATIONS FOR OFF-ROAD NEW DIESEL ENGINES AND EQUIPMENT

CHINESE MINISTRY OF ECOLOGY AND ENVIRONMENT DELEGATION

NOVEMBER 28, 2018

MOBILE SOURCE CONTROL DIVISION
OUTLINE

- Background
- Current Regulations
- Percent Reductions
- Possible Future Next Steps
THE IMPORTANCE OF OFF-ROAD DIESELS
CURRENT CALIFORNIA TIER 4 REGULATIONS

- Aligned with 2004 Federal Nonroad Regulations
- 90% PM Reductions
  - Diesel Particulate Filters (DPF)
- 85% NOx Reductions
  - Selective Catalytic Reduction (SCR)
- Transient Test Cycle
OFF-ROAD EQUIPMENT AND POWER

- < 19 kW
- 19 ≤ kW < 56
- 56 ≤ kW < 130
- 130 ≤ kW ≤ 560
- > 560 kW
EMISSION STANDARD TIERS BY YEARS OF IMPLEMENTATION

Off-Road Compression-Ignition (Diesel) Engine Standards (NMHC+NOx/CO/PM in g/kW-hr)

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a) The PM standard for hand-start, air cooled, direct injection engines below 8 kW may be delayed until 2010 and be set at 0.60 g/kW-hr.
b) Standards given are NMHC/NOx/CO/PM in g/kW-hr.
c) Engine families in this power category may alternately meet Tier 3 PM standards (0.40 g/kW-hr) from 2008-2011 in exchange for introducing final PM standards in 2012.
d) The implementation schedule shown is the three-year alternate NOx approach. Other schedules are available.
e) Certain manufacturers have agreed to comply with these standards by 2005.

Legend:
- Tier 1 Federal
- Tier 1
- Tier 2
- Tier 3
- Tier 4 Interim / Final
ADVANCED AFTERTREATMENT CONTROL TECHNOLOGIES

- Catalyzed Diesel Particulate Filters (DPF)
- Selective Catalytic Reduction (SCR) Systems
- Ultra Low-Sulfur Diesel Fuel (15 PPM)
TIER 4 IMPLEMENTATION OPTIONS

- Provides Multiple Compliance Alternatives
  - Phase-in Schedule
  - Alternate NOx Schedule
  - Small Engine Provisions
- Helped to Keep Costs Down
COMPLIANCE OPTIONS

- Averaging, Banking, and Trading Program
- Equipment Manufacturer Flexibility Program
- Technical Hardship Relief
- Small Business Relief
TIER 4 IN-USE PROVISIONS

- Not-To-Exceed Limits
- Revised Defect Reporting
DIFFERENCES BETWEEN CALIFORNIA AND FEDERAL TIER 4 REGULATIONS

- **Enhanced Labeling Requirements**
  - To identify non-conforming engines in-use

- **Certification for Flexibility Engines**
  - To ensure complete enforcement authority
POSSIBLE FUTURE NEXT STEPS

- More Stringent Standards For Engines Less Than 56 kW
  - Lower PM for engines < 19 kW
  - Lower NOx for engines 19 ≥ and < 56 kW
  - Current feasibility study underway

- Future Tier 5 Regulations
  - Lower NOx emission standards for engines ≥ 56 kW
OVER HALF OF NEW OFF-ROAD DIESEL ENGINES HAVE NO DPFS

Sales of engines under TPEM relief provisions are not included in these estimates.
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