

CNG Repowers for Heavy-Duty Vehicles

Clean Fuels Program Advisory Group February 2, 2011

David Coel, On-Road Mobile Source

South Coast Air Quality Management District

CNG HDV Repowers WHY?

Promotes Additional Low-Emission CNG Vehicles

- Potential Access to Funding Opportunities
- Fleet Rules Cost-Effective Method of Compliance
- May Facilitate Additional OEM Factory Built Models

Current CNG Engine Models (Spark Ignition)

(2010 - 2011 MY)

Cummins ISLG

- > 8.9 liter, 250-320 HP, 660-1000 ft-lb
- > NOx: 0.2 Std EGR, TWC



ESI Phoenix

- > 7.6 liter, 175-265 HP, 480-820 ft-lb
- NOx: 0.2 Std TWC



Doosan GLK11

- > 11.1 liter, 286 HP, 904 ft-lb
- > NOx: 0.2 Std OC, SCR



McNeilus Concrete Truck

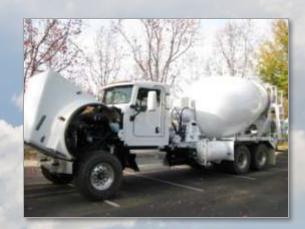
- Background
 - Cummins Westport ISLG
 - > 4,700 Vehicles
 - > 8% of HDV Population
 - Engine Continuously
 - Operating
 - CEQA Impact for New Construction





McNeilus Concrete Truck (cont.)

- Program Outline
 - Develop/Demonstrate CNG Concrete Mixer Truck for Commercial Viability
 - Partner with McNeilus Truck Manufacturing
 - Project Start Date: October 2009
 - Re-engineer Prototype CNG Concrete Truck
 - ISLG Engine, Kenworth Chassis
 - Emission Testing
 - Incorporates Fleet Survey



Valley Power Refuse Truck Demonstration Project

Proof of Concept

- > One Truck, 1998 Crane Carrier with Cat 3306 Diesel, Repowered with 2009 MY Doosan
- Modifications: Radiator, wiring harness, engine mounts, exhaust system; new transmission
- Five month Demonstration Completed in 2009 by Valley Vista Services
- Cost: \$130,000, Funded by Valley Power Systems
- Cost Effectivness (Carl Moyer): \$11.6K/ton, 50% Share

Valley Power Refuse Truck Project (cont.)

- Carl Moyer Funding Request Criteria
 - > Evaluated on Case by Case Basis
 - > Prototype Needed
- Proposed Project
 - > 4 Solid Waste Collection Vehicles (1997 MY)
 - Repower with 2010 MY Engine with SCR



> \$68,800 Requested per Vehicle

Waste Management Refuse Truck Repower

- Purpose Proof of Concept
- Satisfy Carl Moyer Requirement for Prototype
- Repower 2005/2006 Freightliner Truck with 2010 MY ISLG
- 6 Month Demonstration, to be Completed by end of 2011

Waste Management Refuse Truck Repower

- Incorporates Emission Testing
- Project Cost: \$300,000; AQMD Contribution \$75,000
- Estimated 2.6 tpd NOx Reduction if all Remaining Diesel Refuse Trucks
 Converted to Alt Fuel

Emission Solutions, Inc Phoenix CNG Engine

- AQMD Funded Certification,
 Successfully Completed July 2009
- AQMD Funded Crash Testing in School Bus Completed Jan. 2011
- Repowers Performed in Multiple Applications
- Potential Reductions if All Diesel School Buses are Repowered to CNG: 2.5 tpd NOx







