



CNG Repowers for Heavy-Duty Vehicles

Clean Fuels Program Advisory Group

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**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 Effectiveness (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 NO_x

