Near-Zero Heavy-Duty Engines and In-Use Emissions Testing Program Update

Clean Fuels Advisory Group
September 1, 2016



Cleaning the Air That We Breathe…

Development Objectives

- 90% reduction in NOx from 2010 standard
- No increase in HC and PM
- Maximum reduction in GHG
- Maximum 10 ppm ammonia (cycle average)
- No loss of engine performance
- Durable system
- Minimum cost increase

Development Process

Engine Development

Chassis Integration

On-Road Demonstration

NG Development Projects

Engine	Manuf.	Vehicle Class	Status
6.7L	CWI	LHD-MHD	Certified 0.1 g/bhp-hr 2017 Production
8.8L	PSI	LHD-MHD	Early development
8.9L	CWI	MHD	Certified 0.02 g/bhp-hr Production started
11.9L	CWI	MHD-HHD	Testing prototypes
15L	Cummins	HHD trucks	Tested – 0.02 g/bhp-hr No production date

Diesel Development Projects

- Issued RFI to obtain technical and cost information
- Solicited funding and determine technical scope
- Issue RFP for ultra-low emission diesel engines
- Execute contract with one or more providers

Schedule

July 2016	Issue RFI
Early 2017	Issue RFP
Late 2017	Execute contract(s)
2019/2020	Complete project

Deployment of Near-Zero Engines

- Cummins 8.9-liter engine in production
- New Flyer will offer transit bus with 8.9-liter engine in Q4 2016
- Other vehicle OEM's developing vehicles
- Incentives for 0.02 g/bhp-hr engines available
  - Class 7-8 Trucks (Prop. 1B) - $100,000
  - Transit buses (MSRC) - $ 15,000
  - School buses (Lower Emission School Bus)~ TBD

In-Use Emissions Testing Program

- On-road heavy-duty engines
  - Meet 0.2 g NOx and 0.01 g PM emissions
  - CARB optional NOx emission standard
  - In-use emissions may be higher
- Increase vehicle population with newer technologies
  - Large NOx and PM emissions reduction
  - New generation natural gas engine
- In-use emissions testing program

In-Use Emissions Testing Scope of Work

- Collect and analyze vehicle activity data
- Conduct in-use emissions testing of up to 200 heavy-duty vehicles
- Tentative Test Matrix

Vehicles	Number	Fuel
Goods Movement Trucks	100	**Natural gas, Renewable natural gas, diesel, renewable diesel, and alternative fuels (hybrid and fully electric)**
Delivery trucks	40	
Refuse trucks	30	
School and transit buses	30	

- Assess technology and fuels on fuel consumption and emissions
- Match technology to vocation

In-Use Emissions Testing Funding Partners

- SCAQMD
- CEC
- CARB
- Southern California Gas Company

Status of In-Use Emissions Testing

- Recommended Contractors
  - University of California Riverside/CE-CERT
  - West Virginia University
- Capability of contractors
  - Chassis dynamometer
  - Transportable laboratory
  - Experience investigators
- Approved by Technology Committee
- SCAQMD Governing Board consideration – September 2, 2016