Southern California Chapter of the Association of Energy Engineers

SCAQMD Fleet Rules and Clean Fuels Program

June 16, 2011

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Manager, On-Road Mobile Source
South Coast Air Quality Management District
Why Vehicle Fleet Rules?

- Contribution to Ozone and Particulate Air Quality
- Significant Contributors to Localized and Regionwide Air Toxic Exposures
- Mobile Source Fair Share
Fleet Rule Construct:

- Purchase Cleanest Vehicles Available
- Alternative Fuel Application Niches
- Need for Feasible Implementation
- Long-Term Perspective
SCAQMD Fleet Vehicle Rules

- 1191 - Light- and Medium-Duty Public Fleets
- 1192 - Transit Buses
- 1193 - Refuse Collection Vehicles
- 1194 - Commercial Airport Ground Access
- 1195 - School Buses
- 1196 - Heavy-Duty Public Fleet Vehicles
- 1186.1 - Less-Polluting Sweepers
Major Contributors to NO\textsubscript{x} (2014)

- Trucks & Buses: 24%
- Off-Road Equipment: 25%
- Aircraft/Ships/Trains: 20%
- Light- & Medium-Duty Vehicles: 20%
- Fuel Combustion: 4%
- Misc.: 7%

2014 NO\textsubscript{x} – 650 tpd
Major Contributors to VOC (2014)

- Consumer Products (19%)
- Off-Road Vehicles/Equipment (25%)
- Light- & Medium-Duty Vehicles (23%)
- Industrial Processes (4%)
- Solvent Evaporation (6%)
- Cleaning & Surface Operations (8%)
- Petroleum Prod. & Mktg (6%)
- Misc. (3%)
- Fuel Combustion (1%)
- Aircraft/Ships/Trains (3%)
- Trucks & Buses (3%)

2014 VOC – 569 tpd
Litigation Initiated Aug. 2000
- EMA and WSPA vs SCAQMD
- Alleges Fleet Rules pre-empted by Clean Air Act

SCAQMD Issues Advisory Notices in 2004 and 2005
- Fleet Rules apply to Public Fleets
- Fleet Rules apply to Private Fleets under contract to Public Entities
- Fleet Rules do not apply to Federal Entities

Settlement Agreement - Feb 2008
- EMA / WSPA and NRDC / SCAQMD
- Market Participant Principle
Market Participant Principle

- Fleet Rules apply to state and local government entities
- Fleet Rules apply to “…private entities under contract to, or operating under exclusive license or franchise with, state and local government entities.”
- Fleet Rules do not apply to “…federal government entities and private entities that are not under contract to, or operating under an exclusive license or a franchise with, state or local government entities.”
- Airport Fleets – case by case determination of exclusivity
Recent Developments

- **Rule 1186.1 Amendment**
  - January 9, 2009
  - Reinforce Alternative Fuel Vehicle use under Governmental Agency Contract

- **Rule 1193 Proposed Amendments**
  - Scheduled May 7, 2010
  - Introduces Alternative Fuel Vehicle use under Governmental Agency Contract
  - Introduces TICR allowances
Objectives

- Rule Language Consistent with Court Decisions
- Address Rule Implementation Issues

Activities

- Public Workshop – September 2009
- Meet and Discuss with Individual Fleets
- Revised Original Staff Proposal
- Implementation Workgroup Meeting – January 20, 2010
- Public Workshop - March 18, 2010
Governmental Agency – Refuse Collection Contracts must Require Use of Alternative-Fuel Vehicles

Rule Does Not Apply to:

- Governmental Agencies when combined number of public and private refuse vehicles is less than 15; or
- Private Fleets which operate with no public contracts or franchise agreements
Envisioned LNG/CNG Fueling Stations

- At Fleet Yards
- At Transfer Stations and Landfills
- Potential – Truck Stops/Fleet Locations

Mobile Refueling

Recent LNG Port Truck Purchases Leading to LNG Fueling Station Expansions Near Intermodal Yards and Warehouse Centers
Recent Implementation Activities

- Continue to Process Exemption Requests From Public Entities
- On-Going Random Compliance Inspections
- Continue Funding Programs for Various Fleets
- Amended Rule 1193 – July 2010
- Released Draft Rule 1193 Implementation Guidance, Reporting Forms
Rule Compliant Engine Availability
Engine Technology Advancements

- Natural Gas Engines Certifications at 2010 Emissions Standards (Starting 2008)
- Large Number of Engines for Class 8 Tractor/Trailers
- Propane Engine Certifications for Several Niche Applications (Type C School Buses, Smaller Heavy-Duty Trucks)
- Potential Alternative Fuel/Hybrid Systems In Development
Natural Gas Engine Availability

- **Natural Gas Light-Duty Vehicle** – American Honda; Ford Taxi Transit Connect; Chevy Impala

- **Heavy-Duty Natural Gas Engine Manufacturers** – Cummins Westport (8.9L); Westport (14.9L); Doosan (11L)

- **Autocar, Kenworth, Freightliner, Peterbilt** – Offering Natural Gas Products

- **Blue Bird, ThomasBuilt** – Type D CNG School Buses

- **Several Upfitters Providing Conversions**
  - BAF Technologies (Crown Victoria, E450)
  - Baytech (GM Engines)
Natural Gas Vehicles Operating in Fleets in Southern California

~ 3,632 Light- and Medium-Duty Public Fleet Vehicles
~ 508 Heavy-Duty Public Fleet Vehicles
~ 4,538 Transit Buses
~ 1,481 School Buses
~ 1,886 Refuse Trucks
~ 298 Street Sweepers
~ 737 Taxicabs and Airport Shuttles
Natural Gas Engine Concerns

- Older Natural Gas Fuel Tanks
  - Need for Maintenance Inspections/Replacement
  - Cost Prohibitive for Larger Fleets
  - Outreach/Education Programs to Address Issue
  - Need for Funding Assistance

- Natural Gas Engine Not Available for Certain Applications

- Continue Infrastructure Expansion
Activities to Address Concerns

- Older Natural Gas Fuel Tanks
  - Conducted Several Workshop on Tank Inspection/Safety
  - Cosponsoring Fuel Tank Inspection Certification Program
  - MSRC Solicitation for Repowers and Tank Replacements
  - Seek Funding for Tank Replacements

- AQMD/DOE Natural Gas Engine Demonstration Projects
  - Cummins/Westport 11.9 L
  - Doosan 11 L
  - Emissions Solutions Navistar 13 L Repower
Future of Natural Gas as Transportation Fuel

- Inherently Cleaner – Does Not Rely on After-treatment Controls as Heavily as Diesel Engines
- Further Criteria Pollutant Reductions with Hybrid Systems
- Renewable Natural Gas – Low Carbon Footprint
- Transition to Hydrogen Fuel
## Estimated Natural Gas Vehicle Population by 2020

<table>
<thead>
<tr>
<th>Rule</th>
<th>Current Natural Gas Vehicle Population</th>
<th>Projected Natural Gas Vehicle Population in 2020</th>
<th>Refueling Infrastructure</th>
<th>Additional Fueling Capacity Needed?</th>
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<tbody>
<tr>
<td>1191</td>
<td>Not Tracked</td>
<td>Not Tracked</td>
<td>Municipal Yard, Public Access</td>
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<tr>
<td>1192</td>
<td>4,538</td>
<td>4,700</td>
<td>Transit Yard</td>
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<td>1193</td>
<td>1,886</td>
<td>4,500</td>
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<td>1194</td>
<td>737</td>
<td>800</td>
<td>Public Access</td>
<td>Sub-Regional</td>
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<td>1195</td>
<td>1,481</td>
<td>2,000</td>
<td>Yard, Public Access</td>
<td>Yes</td>
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<td>1196</td>
<td>508</td>
<td>700</td>
<td>Municipal Yard, Public Access</td>
<td>Yes</td>
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</tbody>
</table>

Total: 9,448

1196.1: 298

Total: 13,100
Existing Natural Gas Stations (with 5 mi radius)
Existing and Planned Stations
Funding Opportunities

- Carl Moyer Program
- Mobile Source Air Pollution Reduction Review Committee (MSRC)
- ARB/AB 118 AQIP – Clean Vehicle Rebate Project
- CEC/AB118 – Buy-down Incentives for Natural Gas and Propane Vehicles
- Federal Tax Credits – Nat Gas Act
Electric/Hybrid Technologies
Infrastructure & Deployment
Hydrogen & Fuel Cell
Emission Control Technologies
Engine Systems
Stationary Clean Fuels Technologies
76 Contracts Executed
- $7.3 Million from Clean Fuels Fund
- $40.0 Million – Total Project Costs
- 1:5.5 Leveraging

Completed Projects
- 18 Research RD³ Projects
- 20 Technology Assessment and Transfer Projects
2010 Contracts

$7.3M AQMD; $40.0M Total
2010 Cost Leveraging

- Infra & Deployment
- Fuels/Emissions Studies
- Emission Control Tech
- Electric/Hybrid Tech
- Engine Tech
- Hydrogen & Fuel Cell Tech
- Stationary Tech
- Outreach & Tech Transfer
Federal Funding Awarded in 2010

- U.S. EPA
  - $1 Million – Retrofit Heavy-Duty Trucks with Emission Controls
  - $900k – Develop and Demonstrate Heavy-Duty Truck Emission Control
  - $1.5 Million – Demonstrate Maritime Emission Control Technology
  - $1.1 Million – School Bus Replacement Program
  - $2.9 Million – Toxic Air Contaminants and Criteria Pollutants Reduction Incentive Programs
  - $100k – Installation of Air Filtration Systems in Schools
  - $300k – Development of Heavy-Duty Electric Trucks
State Funding Awarded in 2010

- CEC
  - $2.9 Million – Construct and Install Natural Gas Stations
  - $5.1 Million – LNG Drayage Truck Replacement Program
2010 Project Highlights

- Develop and Demonstrate Fuel Cell Bus
- Develop and Demonstrate Electric Bus and Quick Charge Infrastructure
- Develop and Demonstrate Electric Drive Conversion
- Develop Heavy-Duty Truck Emission Controls
Demonstrate Biogas Engine Emission Control Technology
Deploy Hybrid Electric Vehicle Trucks and Buses (HVIP program)
Projects Completed in 2010

- Demonstrate Fuel Cell Bus
- Develop and Demonstrate Heavy-Duty Hybrid Electric Vehicle
- Demonstrate Advanced Boiler Technology
2011 Plan Update Overview

- Identifies technical areas
- Describes projects in each plan area
- Proposes costs for projects
- Advisory group comments & responses
Plan Update

$16.1M Total

- Engine Systems: 18%
- Health Impacts Studies: 5%
- Hydrogen & Fuel Cell: 13%
- Stationary Technologies: 4%
- Outreach & Technology Transfer: 5%
- Infrastructure & Deployment: 11%
- Electric/Hybrid Technologies: 31%
- Fuels/Emission Studies: 8%
- Emission Control Tech: 5%