Heavy-Duty Natural Gas Drayage Truck Replacement Program

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South Coast Air Quality Management District
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Project ID # ARRAVT045

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# Overview

## Timeline
- **Start:** January 2010
- **Finish:** January 2014
- **67% Complete**
- **121 LNG trucks deployed**
- **Additional LNG trucks to be deployed by 6/30/11**

## Barriers
- Higher cost of NG vehicle
- Limited experience with NG technology
- Limited infrastructure for re-fueling
- Concerns about maintenance
- Currently only one engine manufacturer (Cummins Westport)
- Difficulty for individual owners/operators to secure financing
- Long lead time for manufacturing

## Budget
- **Total Project Funding:** $33,740,000
  - **DOE:** $9,408,389
    - $7,967,550 for trucks
    - $500,000 education/outreach
    - $940,839 administrative
  - **Cost Share:** $24,331,611

## Partners
- **Project Lead:** South Coast Air Quality Management District
- **U.S. DOE**
- **California Air Resources Board**
- **Ports of Los Angeles and Long Beach**
- **U.S. EPA**
- **5 Clean Cities Coalitions**
Project Objectives/Relevance

The Ports of Los Angeles and Long Beach represent the largest Port complex in the U.S. Heavy-duty diesel trucks serving the Ports are a significant source of air pollution in the region. Replacement with alternative fuel vehicles can provide immediate and long-term air quality benefits.

- Increase the use of alternative fuels and reduce U.S. dependence on imported petroleum fuels
- Achieve significant reductions in NOx and diesel PM emissions
- Reduce toxic air emissions and associated public health risk from diesel fuel combustion
- Reduce greenhouse gas emissions
- Create and preserve jobs to stimulate the economy
- Increase end-user knowledge, experience and acceptance of alternative fuel vehicles
- Provide outreach and training to truck operators and technicians involved in maintaining alternative fuel vehicles
Approach

• Grant funds will be used to offset the incremental cost of a natural gas truck
• Old diesel truck must be scrapped and replaced with the NG vehicle
• Solicit applications by issuing Program Announcements
• Extensive outreach with the help of the Ports, trucking associations, natural gas engine manufacturers, and truck dealerships
• Translation support services
• One-on-one meetings with applicants
• Orientation and contract workshops
• Meetings with financial institutions:
  ➢ Clarify program requirements
  ➢ Assist individual truck owner/operators in obtaining financing for the balance not covered by the grant funds
Technical Accomplishments and Progress

Past Accomplishments:
- Solicited applications in July 2009
- Received over 1,500 applications, including diesel and natural gas trucks
- 559 LNG trucks deemed eligible
  - Of these, 121 LNG trucks received DOE grant funds
- All 121 LNG trucks were in operation by 12/31/10

<table>
<thead>
<tr>
<th>Emission Reductions (tons/yr)</th>
<th>NOx</th>
<th>PM</th>
</tr>
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<tbody>
<tr>
<td>121 LNG Trucks *</td>
<td>102</td>
<td>3.5</td>
</tr>
</tbody>
</table>

* These LNG trucks represent a subset of the 559 LNG trucks approved under AQMD’s Heavy-Duty Diesel Truck Replacement Program.

Source: California Air Resources Board, Proposition 1B Calculator, EMFAC2007.
Technical Accomplishments and Progress

New Accomplishments:

- Completed quarterly performance monitoring for LNG trucks deployed in 2010
- Continued education/outreach activities: 3 outreach events in 2010, and 7 planned in 2011
- Issued new solicitation in February 2011 (received over 1,400 applications)
- 95 LNG trucks deemed eligible
- 15 contracts completed
- Remaining LNG trucks scheduled to be operational by 6/30/11
- Total Number of LNG Trucks Deployed under DOE Clean Cities Grant by 6/30/11: 216
Technical Accomplishments and Progress (Continued)

- Through a successful partnership with DOE and other funding partners, AQMD will exceed the 180 NG vehicles planned and achieve additional air quality and job benefits in the region.

- Emission reductions will occur over the useful life of each LNG truck, which is estimated at ≥ 15 years.

- The project will reduce consumption of diesel fuel by 2.68 million gallons per year.

- The project will also result in at least a 25% reduction in greenhouse gas emissions.

- This project will preserve/create jobs related to manufacturing, natural gas refueling, maintenance and operation of the NG vehicles.

- Based on 216 LNG trucks deployed, it is estimated there will be about 28 jobs created and retained.
Collaborations/Partnerships

• AQMD is serving as the “prime” for this project
• Funding partners include:
  – U.S. Department of Energy, Clean Cities Program
  – California Air Resources Board
  – Port of Los Angeles and Port of Long Beach
  – U.S. Environmental Protection Agency
  – California Energy Commission
• Extensive outreach involving the following partners:
  – Natural gas engine/truck manufacturers
  – Truck dealerships
  – Ports Clean Truck Center
  – Trucking Associations
  – 5 Clean Cities Coalitions
Future Work

• Monitor schedule of deployment for remaining NG trucks
  - All NG trucks expected to be operational by 6/30/11
• Performance Monitoring:
  - Continue to collect quarterly operational data (e.g., mileage and fuel use)
  - Assist truck owners/operators
  - Conduct random inspections/audits
  - Work closely with the Ports to verify the total number of annual port visits by each truck
    - Each drayage truck is equipped with a radio frequency identification (RFID) tag that is used to record each time a truck enters or leaves the Ports
• Continue education/outreach efforts
  - 7 events planned in 2011
Summary –
LNG Drayage Truck Project

• Relevance: The program was designed to achieve the following objectives:
  - Increase use of alternative fuels
  - Displace consumption of diesel fuel
  - Significant reductions in emissions
  - Create jobs to stimulate the economy
  - Provide outreach and training
  - Increase end-user experience with alternative fuel vehicles
Summary – LNG Drayage Truck Project

• Approach: Provide incentive for truck owners/operators to replace an old, heavy-duty diesel truck with a new natural gas vehicle
  ➢ Grant funds are used to help offset the high cost of a new NG vehicle
  ➢ Extensive outreach is needed to inform truck owner/operators, manufacturers, dealers, financial institutions, and other stakeholders of funding availability and program requirements
  ➢ Close coordination with engine/truck manufacturers and dealers to ensure NG vehicles will be properly maintained
  ➢ Close coordination with truck manufacturers to ensure NG vehicles will be delivered on-time
  ➢ Monitor performance of NG vehicles annually and conduct random inspections
Summary – LNG Drayage Truck Project

• Technical Accomplishments (DOE Portion Only):

<table>
<thead>
<tr>
<th>Calendar Year</th>
<th>No. of LNG Trucks</th>
<th>Emissions Reductions (tons/yr)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>NOx</td>
</tr>
<tr>
<td>FY2010</td>
<td>121</td>
<td>102</td>
</tr>
<tr>
<td>FY2011 (Planned)</td>
<td>95 (by 6/30)</td>
<td>80</td>
</tr>
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• Results:
  - Increased use of alternative fuels
  - Significant reductions in NOx and diesel PM emissions
  - Reduced air toxic emissions and associated public health risk
  - Reduced GHG emissions
  - Preservation and creation of jobs related to manufacturing, natural gas refueling, maintenance and operation of the natural gas vehicles
Collaborations

- Close coordination and collaboration with funding partners, including:
  - U.S. DOE, Clean Cities Program
  - U.S. EPA
  - California Air Resources Board
  - Port of Los Angeles and Port of Long Beach
  - 5 Clean Cities Coalitions

AQMD is using a combination of grant funds to leverage sufficient funds to offset the high cost of the natural gas vehicles.

This program has resulted in a high demand for the grant funds.

Only the most cost-effective projects are funded.

Each funding source has specific requirements and AQMD is maximizing the use of these funds to deploy as many NG vehicles possible given the available funds.