# 2013 DOE Vehicle Technologies Program Review

# *Houston Zero Emission Delivery Vehicle Deployment Project*

Christine Smith (P.I.) – Air Quality Coordinator
Nicholas Williams (Presenter)

*Houston-Galveston Area Council*
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**Project ID: VSS116**

# Overview

## Timeline

- Start date – Oct 1, 2012
- End date – Sept 30, 2015

## Budget

- Total funding
  - DOE share: $2,430,177
  - Contractor share: $2,760,000
- No invoices have been submitted to DOE to date
- FY13 Expected Expenditure:
  - DOE share: $1,094,500
  - Contractor share: $920,000

## Barriers

1. By 2015, demonstrate a 50% improvement in freight hauling efficiency
2. Public (and fleet) acceptance of electric drive vehicle as central vehicle choice
3. Reduce petroleum consumption, CO2 emissions, and criteria pollutants (NOx)

## Partners

- Collaborators
  - Center for Transportation and the Environment (CTE)
  - Smith Electric Vehicles
- Project Lead
  - Houston-Galveston Area Council (H-GAC)

# Relevance – Program Objectives

**Primary Objective**: Demonstrate effectiveness of all-electric delivery vehicles to perform at the same level of operation as similarly sized diesel delivery vehicles while reducing vehicle emission and petroleum consumption.

**Project Outcomes**:

- Deployment of 30 medium- and heavy-duty electric delivery trucks in HGB nonattainment area.
- Vehicles demonstrated by selected fleet operators (including UPS, Frito-Lay, FedEx, Coca-Cola, and Cintas)
- Vehicle testing, data collection, and reports demonstrating emission reductions.

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# Approach / Strategy

- **Addresses barriers by…**

| Barriers | Project Goals |
|---|---|
| By 2015, demonstrate a 50% improvement in freight hauling efficiency | a) Test equipment and gather data to evaluate performance of vehicle and track fueling/charging requirements<br>b) Evaluate market viability of vehicles by comparing performance and efficiency of all-electric and diesel vehicles |
| Public (and fleet) acceptance of electric drive vehicle as central vehicle choice | Lowering bar to fleet acceptance of all-electric vehicles by engaging large national fleets, demonstrating vehicles under real-world conditions and daily operations, and publicizing the vehicles within the Texas market. |
| Reduce petroleum consumption, CO2 emissions, and criteria pollutant emissions (including NOx, PM) | Directly reducing petroleum use GHG emissions, and criteria pollutants of vehicles on the road |

# Project Timeline - Overview

| Task / Milestone | Dates |
|---|---|
| ***Electric Delivery Trucks*** | |
| Issue purchase order for vehicles | June 2013 |
| First vehicle delivered | September 2013 |
| All vehicles delivered | December 2013 |
| ***Charging – EVSE*** | |
| Issue purchase order for charging equipment | June 2013 |
| Receive equipment | September 2013 |
| Installation complete | December 2013 |

# Timeline (Continued)

| Task/Milestone | Date |
|---|---|
| ***Vehicle Demonstration & Data Collection*** | |
| Route evaluation, modeling, and selection | April 2013 – July 2013 |
| Collect monthly operating data, evaluate, report | Dec 2013 – Sept 2015 |
| ***Project Management*** | |
| Administer contract with DOE | November 2013 |
| Project kickoff meeting | April 2013 |
| Reporting to DOE | Jan 2013 – Sept 2015 |

# Milestones & Decision Points

| Milestone / Decision Point | Dates | Status |
|---|---|---|
| Route evaluation, modeling, and selection | April – July 2013 | Initial Planning |
| Issue purchase order for vehicles | June 2013 | On schedule |
| Issue purchase order for charging equipment | June 2013 | On schedule |
| First vehicle delivered to selected fleet operators | Sept 2013 | On schedule |
| ***Fleet operators perform successful inspection and acceptance test*** | Sept – Oct 2013 | **Decision Point** |
| Receive, test, and install charging equipment | Sept – Dec 2013 | On schedule |
| All vehicles delivered | December 2013 | On schedule |
| ***Route validation testing should demonstrate that vehicles perform as expected for specified route*** | December 2013 | **Decision Point** |
| Place vehicles into operational delivery service | December 2013 | On schedule |

# Technical Accomplishments & Progress *October 2012 – March 2013*

| Task / Milestone | Status |
|---|---|
| ***Task 1 – Project Management & Planning*** | |
| 1.A Project Initiation<br>*Contract execution*<br>*PMP Development*<br>*Project Kick-off* | Complete |
| 1.B Project Administration<br>*Monthly status report*<br>*Quarterly Reports to DOE* | Ongoing |
| ***Task 2 – Vehicle Design and Build*** | |
| 2.A Vehicle Procurement<br>*Define requirements for vehicle procurement* | Initiated |
| ***Task 4 – Vehicle Support & Maintenance*** | |
| 4.B Charging Station Installation<br>*Define fast charge station requirements* | Initiated |

# Collaboration

- Contract Lead –
  - Houston-Galveston Area Council
- Project Support & Data Management –
  - Center for Transportation and the Environment (CTE)
- OEM –
  - Smith Electric Vehicles
- Fleet Operators (national and local partners) –
  - Frito-Lay
  - Coca- Cola
  - Cintas
  - FedEx
  - UPS

# Future Work

## FY13

- Engage with fleet partners
- ***Task 2*** – Vehicle Design & Build
  - Vehicle procurement
- ***Task 3*** – Vehicle Deployment and Demonstration
- ***Task 4*** – Vehicle Support and Maintenance
  - Charging station installation
  - Vehicle introduction
    - Operator and maintenance training
    - Prepare for data collection
    - Validate route
- ***Task 5*** – Vehicle Testing
  - Route evaluation, modeling, and selection
  - Select baseline routes and vehicle models
  - Operational service starts
- ***Task 6*** – Test Data
  - Prepare baseline data collection and evaluation
  - Collect vehicle operating data
  - Generate reporting

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# Future Work

## FY14

- ***Task 5 & 6*** – Vehicle Testing & Test Data
  - Continued data collection, documentation, and reporting
- Vehicle and infrastructure analyses including
  - ***Task 7*** – Cost analysis
  - ***Task 8*** – Benefit analysis of expected reductions in petroleum consumption, GHG emissions, and criteria pollutant & toxic emissions

***Project requires deployment, demonstration, and collection of performance data for vehicles and infrastructure for at least 2 years.***

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# Summary

- Primary objective of this project is to demonstrate feasibility of replacing existing diesel delivery trucks with all-electric vehicles
- Project will deploy and demonstrate 30 zero-emission delivery vehicles, with selected fleet operators demonstrating the efficiency of cargo delivery operations when compared to conventional diesel trucks
- Project is expected to reduce petroleum consumption by over 250,000 gallons of diesel fuel over the 2-year demonstration period
  - Projected to reduce at total of GHG emissions by 37.5 MMTCE/year and reduce 69.67 tons of criteria pollutants per vehicle per year

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