# 2013 DOE Vehicle Technologies Program Review

# *Hydrogen Fuel-Cell Electric Hybrid Truck Demonstration*

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*Houston-Galveston Area Council*
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**Project ID:**
**VSS117**

# Overview

## Timeline

- Start date – Jan 16, 2013
- End date – Nov 30, 2015

## Budget

- Total funding
  - DOE share: $3,400,823
  - Contractor share: $4,253,556
- No invoices have been submitted to DOE to date
- FY13 Expected Expenditure:
  - DOE share: $1,075,000
  - Contractor share: $ 1,200,450

## Barriers

1. Maintaining aggressive timeline for manufacture of advance vehicle technology
2. Final certification of vehicle emissions requirements
3. Establishment of fueling infrastructure with adequate supply of hydrogen

## Partners

- Collaborators
  - Total Transportation Services, Inc
  - Vision Industries Corporation
  - Air Products and Chemicals
  - Environmental Defense Fund
  - Wal-Mart Stores, Inc *(demonstration partner)*
- Project Lead
  - Houston-Galveston Area Council (H-GAC)

H-GAC
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# Relevance – Program Objectives

Address barriers to widespread acceptance of technology

Align project goals with program objectives

| Barriers | Project Goals |
|---|---|
| Maintaining aggressive timeline for manufacture of advance vehicle technology | Timely delivery of 20 zero emission Class 8 advanced technology vehicles |
| Final certification of vehicle emissions requirements | Successful completion of California Air Resource Board (CARB) emission certification |
| Establishment of fueling infrastructure with adequate supply of hydrogen | Development and commercialization of hydrogen fueling station with co-located 240v electric charging station. |

# Approach / Strategy

**Primary Objective**: Accelerate introduction and penetration of electric transportation technologies, specifically 20 hydrogen fuel cell – electric hybrid drayage trucks, into the cargo transportation sector.

**Project Outcomes:**

- Create largest demonstration of hydrogen fuel cell – electric hybrid drayage trucks in the United States.
- Reduce criteria pollutant emissions, greenhouse gas emissions, and fossil fuel use of Houston region drayage truck fleet.

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# Milestones

| Timeline | Milestone | Progress |
|---|---|---|
| October – December 2012 | Award Notification | Complete |
| January – April 2013 | Contract Negotiation and Finalization | In Progress |
| June 2013 – March 2014 | Development of Infrastructure at PHA | Not Started |
| July 2013 – May 2014 | Delivery of Vehicles | Not Started |
| September 2013 | Vehicle testing begins | Not Started |
| September 2013 – October 2015 | Full Demonstration of All Vehicles | Not Started |
| November 2015 | Mileage Range Testing Complete for TYRANO vehicles | Not Started |

# Accomplishments & Progress

## *January – March 2013*

| Task / Milestone | Status |
|---|---|
| ***Task 1 – Project Management & Planning*** | |
| 1.A Project Initiation<br>*Contract execution*<br>*PMP Development* | Complete |
| 1.B Project Administration<br>*Monthly status report*<br>*Quarterly Reports to DOE* | Ongoing |

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# Collaboration

- Contract Lead –
  - Houston-Galveston Area Council
- Cost Share Partners –
  - Total Transportation Services, Inc (TTSI)
  - Vision Industries Corporation
  - Environmental Defense Fund
- Hydrogen Fuel Provider –
  - AirProducts and Chemicals, Inc
- Demonstration Partner –
  - WalMart (drayage contract)

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# Future Work

**FY13**

- Establish refueling and recharging infrastructure
- ***Task 2*** – Vehicle Design & Build
  - Order vehicle components
  - Assembly of Vehicles
  - Delivery of Vehicles
- ***Task 3*** – Vehicle Deployment and Demonstration
  - Expected delivery will begin in August 2014 with two trucks per month
- ***Task 4*** – Vehicle Support and Maintenance
- ***Task 5*** – Vehicle Testing
  - Data Collection
  - Initial testing will begin with vehicle traveling within a 15 mile radius during an 8-hr work day
  - Other testing will include top speed, acceleration, refueling time, and ambient temperature effects

# Future Work

## FY13/14

- ***Task 6*** – Test Data
  - Data will be collected upon initial vehicle deployment
  - Vehicle performance will be monitored under different work cycles, travel ranges, road grades, and temperature variables
- ***Task 7 & 8*** – Cost Analysis and Benefits Analysis
  - Reported annually and documented in final report
  - Vehicle costs will be documented
  - Expected emission reductions and petroleum consumption will be monitored and documented to evaluated air quality benefits

***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 accelerate introduction and penetration of electric transportation technologies through deployment of 20 hydrogen fuel cell – electric hybrid drayage trucks.
- Project is expected to reduce petroleum consumption by over 1.1 million gallons of diesel fuel over the lifetime of the vehicles.
- Project projected to reduce pollutant emissions
  - Reduce GHG emissions by 78 metric tons per truck per year
  - Reduce 1.94 tons of NOx emissions per vehicle per year and 0.04 tons of PM per vehicle per year

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