

2014 DOE Vehicle Technologies Program Review

Hydrogen Fuel-Cell Electric Hybrid Truck & Zero Emission Delivery Vehicle Deployment

Allison Carr (P.I. & presenter) – Senior Air Quality Planner
Nicholas Williams (P.I.) – Air Quality Coordinator

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



Overview

Hydrogen Fuel-Cell Electric Hybrid Truck Project

Timeline

- Start date – October 1, 2013
- End date – November 30, 2015

Budget

- Total funding
 - DOE share: \$3,400,823
 - Contractor share: \$4,253,556
- FY13 Expenditure:
 - \$526.77 (travel)
- FY14 Expected Expenditure:
 - Dependent on selected Path Forward

Barriers

1. High cost of Class 8 hydrogen fuel-cell electric hybrid trucks
2. Financing vehicles & coordinating multiple funding sources is very complicated
3. Uncertainty related to deploying hydrogen fueling infrastructure and vehicle technologies in typical fleet use

Partners

- Collaborators
 - Initial project partners – *Total Transportation Services, Inc (TTSI), Vision Industries Corporation, Air Products, EDF*
- Project Lead
 - Houston-Galveston Area Council



Overview

Zero Emission Delivery Vehicle Deployment

Timeline

- Start date – October 1, 2012
- End date – September 30, 2015

Budget

- Total funding
 - DOE share: \$2,430,177
 - Contractor share: \$2,760,000
- FY13 Expenditure:
 - \$36,571.14
- FY14 Expected Expenditure:
 - Dependent on current Call for Projects
 - DOE share: \$1,055,000
 - Contractor share: \$1,295,000

Barriers

1. High cost of low volume orders for all-electric medium-/heavy-duty trucks
2. Uncertainty in production capabilities and timeline for all-electric trucks
3. Fleet acceptance of electric drive vehicle by matching trucks to the correct applications and routes

Partners

- Collaborators
 - Center for Transportation and the Environment
 - Initial OEM partner – *Smith Electric Vehicles*
- Project Lead
 - Houston-Galveston Area Council



Relevance

Primary Objective: Accelerate introduction and penetration of electric transportation technologies into the cargo transportation sector, specifically:

- 20 hydrogen fuel cell – electric hybrid Class 8 trucks
- 30 all-electric delivery vehicles (i.e. box trucks, step vans)

Barriers	Project Activities
High cost of vehicles	Provide grant funding to incentivize deployment and testing of medium/heavy-duty zero emission vehicles
Risk associated with uncertain production capabilities and project financing	Restructure and/or simplify the process for granting ZECT funding through H-GAC
Challenges to fleet acceptance related to lack of infrastructure and matching vehicles to appropriate routes or applications	Provide funding for required infrastructure & Conduct data collection and analysis on vehicle performance to demonstrate emission reductions

Approach / Strategy

To be successful, the deployed technologies (both all-electric and hydrogen fuel-cell trucks) must be:

- Available
- Cost effective
- Meet performance expectations for operation and emission reductions

Therefore, current and future activities include:

- Finalizing / conducting Call for Projects to identify fleet and OEM partners for projects
- Providing grant funding to selected partners to provide incentive for vehicle deployment and reduce barriers due to incremental costs of advanced technologies
- Begin vehicle monitoring, data collection, and performance / benefits analysis

Milestones

Hydrogen Fuel-Cell Electric Hybrid Truck Project

Activity	Timeline
Sub-Agreement Negotiation and Finalization <i>(to be completed through Call for Projects)</i>	8/2014 – 1/2015
Proposed Revision to Project Scope / Path Forward to DOE	Submitted 2/2014
Survey of OEMs, Vehicle Providers, and Fleets	5/2014 – 6/2014
Proposed Call for Projects <i>(for fleet partners with all-electric delivery vehicle OEM)</i>	7/2014 – 9/2014

Possible Path Forward	Timeline
Select Partners & Issue Notice to Proceed	10/2014 – 12/2014
Purchase & Manufacture of Vehicles	11/2014 – 6/2014
Delivery of Vehicles	9/2013 – 7/2014
Vehicle Testing begins	Beginning 11/2015

Milestones

Zero Emission Delivery Vehicle Deployment

Activity	Timeline
Sub-Agreement Negotiation and Finalization <i>(to be completed through Call for Projects)</i>	6/2014 – 11/2014
Proposed Revision to Project Scope / Path Forward to DOE	Submitted 12/2013
Call for Projects <i>(for fleet partners with all-electric delivery vehicle OEM)</i>	5/2014 – 7/2014
Select Partners & Issue Notice to Proceed	8/2014 – 11/2014
Purchase & Manufacture of Vehicles	9/2014 – 4/2014
Delivery of Vehicles	8/2013 – 5/2014
Vehicle Testing begins	Beginning 11/2014
Full Demonstration of All Vehicles	4/20135– 4/2017

Accomplishments & Progress

Project Outcomes for FY13

- Hydrogen Fuel-Cell Electric Hybrid:
 - Project partners requested restructuring of project budget which was incompatible with cost share funding from state agency
 - H-GAC was unable to agree upon sub-recipient agreements with project partners Vision Industries and TTSI
 - Complete survey to identify suppliers of zero emission Class 8 trucks
 - *Next Steps* – Identify and agree upon appropriate path forward for procurement and deployment of zero-emission Class 8 trucks.
- Zero Emission Delivery Vehicles:
 - Project partner, Smith Electric Vehicles, indefinitely suspended production of all-electric trucks
 - *Next Steps* – Complete Call for Projects to select partners for deployment of at least 30 trucks.

Collaboration

- Contract Lead – Houston-Galveston Area Council
- ***Zero Emission Delivery Truck***
 - Project Administration & Technology Partner – Center for Transportation and the Environment
 - Cost Share Partners(s) – Fleets and OEM partners will be determined through Call for Projects administered by H-GAC
 - *Initial OEM partner was Smith Electric Vehicles.*
- ***Hydrogen Fuel-Cell Electric Hybrid Truck Project***
 - Partners TBD
 - *Initial project partners included Vision Industries, Total Transportation Services, Inc (TTSI), AirProducts, and Environmental Defense Fund (EDF)*

Remaining Challenges & Barriers

1) *Addressing Project Delays*

- Confirming path forward for projects with DOE
- Identification of new or additional project partners

2) *Reducing risks associated with uncertainty related to production of vehicles*

- Conducting Call for Projects to identify vehicle demonstration partners (fleets) in partnership with OEMs

3) *Simplifying project reimbursement / payment structure to address financial risks*

Future Work

Next Steps for FY14

- Hydrogen Fuel-Cell Electric Hybrid:
 - Identify and agree upon appropriate path forward for procurement and deployment of zero-emission Class 8 trucks, in partnership with DOE
 - Potentially facilitate Call for Projects for hydrogen (and/or all-electric) Class 8 trucks
- Zero Emission Delivery Vehicles:
 - Complete Call for Projects to select partners for deployment of at least 30 trucks
 - Complete sub-recipient agreements with project partners and issue Notice to Proceed documentation
 - Support fleet & OEM partners in purchase and procurement of vehicles
 - Oversee delivery and initial testing of vehicles
 - Selected project partners begin deployment and data collection

Summary

Hydrogen Fuel-Cell Electric Hybrid Truck Project

- The expense of the hydrogen fuel-cell hybrid trucks requires multiple partners and multiple funding sources (federal, state, private) to cooperate in the deployment of vehicles, as a result:
 - Discussions related to financial risk among partners has resulted in substantial project delays.
 - Original OEM partner, Vision Industries, is unwilling to move forward with the project due to restrictions on state cost share funding
- H-GAC has proposed moving forward with a simplified project budget and is currently gathering information about options for new and/or additional project partners

Summary

Zero Emission Delivery Vehicle Deployment

- Uncertainties and financial challenges with vehicle OEM has created delays and continues to present a risk
 - Original OEM partner, Smith Electric Vehicles, has paused production of their all-electric delivery vehicles in the United States
- H-GAC is conducting a Call for Projects to select new project partners (fleets in partnership with selected OEM) for deployment of 30 trucks in the Houston region
 - The selected fleet partners will purchase vehicles from selected OEMs for delivery and deployment on an aggressive timeline
 - Partners will be required to contribute the required cost share



Thank you.

Allison Carr

allison.carr@h-gac.com

Houston-Galveston Area Council

