

X.9 Hydrogen Education in Texas

Dan Bullock, David Hitchcock
(Primary Contact)
Houston Advanced Research Center (HARC)
4800 Research Forest Drive
The Woodlands, TX 77381
Phone: 281-364-4007
E-mail: dhitchcock@harc.edu

DOE Technology Development Manager:
Carole Read
Phone: (202) 586-3152
E-mail: Carole.Read@ee.doe.gov

DOE Project Officer: Gregory Kleen
Phone: (303) 275-4875
E-mail: Greg.Kleen@go.doe.gov

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Texas H2 Coalition, The Woodlands, TX

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Project End Date: August 31, 2010

Objectives

- Project Aim: Increase basic knowledge and awareness of Texas state and local government leaders about hydrogen and fuel cell technologies.
- Project Objectives:
 - Establish communications to reach the target audience.
 - Assemble needed materials for education and outreach.
 - Conduct workshops and webinars for the five major Texas cities/regions.

Technical Barriers

This project addresses the following technical barriers from the Education Section (3.9) of the Fuel Cell Technologies Program Multi-Year Research, Development and Demonstration Plan:

- (A) Lack of Readily Available, Objective, and Technically Accurate Information
- (C) Disconnect Between Hydrogen Information and Dissemination Networks
- (E) Regional Differences

Contribution to Achievement of DOE Education Milestones

This project will contribute to achievement of the following DOE milestones from the Education section of the Fuel Cell Technologies Program Multi-Year Research, Development and Demonstration Plan:

- Milestone 17: Hold Hydrogen 101 Seminars (4Q, 2008 through 4Q, 2012)

Accomplishments

- Developed Texas e-mail hydrogen/fuel cell contact list to reach target audiences.
- Initiated discussions with regional contacts, including Clean Cities' coordinators, to assist and participate in organizing and conducting metro area workshops.
- Conducted outreach and education activities including four Texas Hydrogen 101 education workshops in four target metro areas; eight outreach events featuring Hydrogen 101 education material and displays in the Dallas/Ft. Worth, Austin, San Antonio, and Houston metro areas and three briefings in Austin and Houston.
- Organized display and demonstration of hydrogen fuel cell transit bus at three outreach events; two in Austin and one in the Dallas/Ft. Worth area.
- Presented project at the DOE 2009 and 2010 Annual Merit Review events.
- Completed and deployed Web site design.
- Assembled basic educational materials, including information on Texas and hydrogen.
- Compiled baseline awareness information of workshop participants.
- Co-sponsored student participation in hydrogen fuel cell vehicle competition: University of Houston School of Technology; Shell Eco-Marathon.
- Organized tour of Houston food warehouse with new fuel cell fork trucks.



Introduction

Between 2000 and 2004, Texas demonstrated considerable interest and activity related to hydrogen and fuel cell technology. During that time, the HARC organized a fuel cell consortium and created a fuel cell testing lab. Interest and activities have declined in the State since 2004. In 2008, in cooperation with the Texas

H2 Coalition and the State Energy Conservation Office, HARC developed the Texas Hydrogen Roadmap. It was apparent from analysis conducted for this report that Texas has significant advantages for hydrogen and fuel cell adoption, but there is relatively little activity within Texas compared with other key states. The provision of informational materials and activities through outreach and education was seen as an effective way of reaching decision makers in Texas. Previous hydrogen/fuel cell efforts by Texas and the Texas H2 Coalition had targeted the five major Texas urban areas, and this same targeting approach was adopted for this project.

Approach

The overall approach for this project takes advantage of HARC’s experience in energy and air quality programs to conduct outreach and education efforts to reach state and local government leaders. Many of these decision makers know of HARC and are located in the five largest metropolitan areas (Figure 1). In addition, the Texas H2 Coalition had worked in most of the target cities to explore hydrogen and fuel cell projects. The outreach and education activities identified for this project included establishing communications with key organizations in these areas (particularly Clean Cities), compiling contact information on the target audience, and conducting workshops and briefings to communicate hydrogen and fuel cell education information. These activities have been organized, whenever possible, in coordination with other metro area events and activities.

Results

The major results to date on this project have been (1) establishing key contacts in each of the target regions, (2) scheduling and implementing hydrogen education workshops, and (3) conducting outreach events in target metro areas. Based on discussions with other state hydrogen education programs, it was important to coordinate workshops with key organizations in the Texas metropolitan areas to best reach the target audience. The workshop format was revised to be shorter in duration with more opportunities for follow-up activities, such as briefings to identified individuals or groups, and participation at related conferences and workshops.

Educational materials developed by DOE and other organizations were reviewed by project staff to determine how they could be utilized. One-page flyers on

each topical areas have been provided to participants, and incorporated in the project’s Web site. A limited number of links to key educational materials and sites was included in the Web site design to refer the target audience to the most relevant, accurate, and informative information sources (for example, DOE’s hydrogen code training Web site). HARC had previously published the Texas Hydrogen Roadmap working with the State Energy Conservation Office, and had compiled Texas-relevant information that could be used for outreach and education. Some of these were incorporated in presentation materials. In addition, HARC identified recent hydrogen fuel cell applications in Texas, including a fuel cell bus and fueling station at the University of Texas at Austin, over 130 new fuel cell fork trucks, and deployment of fuel cells for cell phone tower back-up power. These have been used in the project as real world examples for outreach and education. This included having the fuel cell bus at two workshops and speakers on the fuel cell fork truck deployments.

As an example of coordinative activities, HARC identified a joint opportunity with the National Renewable Energy Laboratory’s (NREL’s) hydrogen code training workshop in San Antonio. HARC worked with NREL staff and contractors to establish a date and meeting place for these two events. This enabled local government staff to publicize and recruit participants for these related events. HARC has been involved in a previous project with area government staff on alternative fuels for the regional airport. The

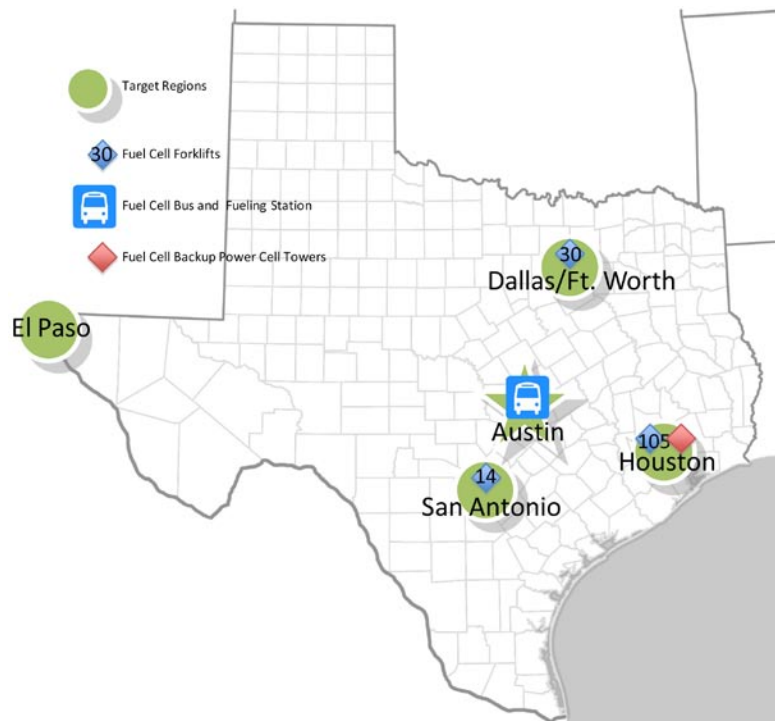


FIGURE 1. Target Regions and Application Examples

area has been considering hydrogen fuel cells as one of their options of interest for potential application at the airport and in related activities at or near the airport. The new fuel cell forklifts that are to be located in the San Antonio area will serve as a real world example for further outreach and education.

Following discussions with various organizations, workshop dates and venues were identified for the Houston, Austin, San Antonio, and Dallas/Ft. Worth areas. The Houston event occurred as part of two related events that reached the target audience, a conference on air quality and another on energy. In all target cities, HARC has worked with Clean Cities' coordinators to communicate with the target audience.

The project has sought ways to assess progress on improving basic knowledge of hydrogen and fuel cells. Toward this end, questions have been posed as part of briefings and outreach to roughly assess the current level of knowledge of the target audience. Topic areas from the DOE's hydrogen education surveys have been used for this purpose to help establish a baseline. Follow-up assessments will be used with workshop participants to gauge progress. This has not been intended as a test/post test survey process, but a rough guide to improving materials and messages in the workshops, as well as improving information on the website.

Finally, various incentives were used to help ensure active participation in Texas workshops and briefings. For example solar flashlights, fuel cell kits and a fuel cell remote control car were used as part of workshops and conference displays, and awarded to participants.

Summary and Future Directions

- The final Hydrogen 101 workshop will be held in the Austin area to follow up on contacts with key state and local leaders.
- Project staff will help inform target audiences in Texas of the Fuel Cell Seminar to be held in San Antonio, October 18-21, 2010.
- Additional opportunities for briefings to target audience will be identified.
- Target audience contacts will continue to be expanded.
- Follow-up assessments will be distributed to participants and the target email list.
- The major conclusions to date are: (1) the key role that Clean Cities programs can play as a conduit to target audiences, and (2) the importance of having real-world applications, such as fuel cell buses, fuel cell fork trucks, and associated hydrogen fueling, for gaining interest.

FY 2010 Publications/Presentations

1. "Hydrogen Education in Texas," DOE Annual Merit Review, presentation, June 10, 2010.
2. "Hydrogen," Alternative Transportation Fuels Panel, Austin Climate Protection Conference and Expo, January 16, 2010.
3. "Hydrogen 101," D. Hitchcock, Houston Engineers without Borders, June 17, 2010.

Hydrogen 101 Workshop Presentations

1. Infrastructure 101 for a Growing Hydrogen Market, B. Weeks, Gas Technology Institute, Austin Workshop presentation, February 24, 2010.
2. Texas Hydrogen 101, D. Hitchcock, Austin Workshop presentation, February 24, 2010.
3. There is a Hydrogen Fuel Cell Bus Operating in Texas, R. Thompson, University of Texas Center for Electromechanics, Austin Workshop presentation, February 24, 2010.