
X.14 H2L3: Hydrogen Learning for Local Leaders

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Subcontractors:

- Public Technology Institute (PTI), Washington, D.C.
- Schatz Energy Research Center, Humboldt State University, Arcata, CA

Project Start Date: October 2008

Project End Date: August 2011

Objectives

- Create presentation materials tailored to effectively communicate with state and local government leaders...relate hydrogen to their interests and spheres of responsibility.
- Establish pathways for working with national associations of state and local officials as a route for disseminating information about hydrogen....set pattern for on-going information flow.
- Launch learning sessions by conducting initial workshops for local and state officials at national gatherings....achieve nationwide reach.
- Create the following report: Infrastructure for Fuel Cells Market Analysis. This report will establish improved understanding of the current state of production, distribution, storage, and the use of hydrogen, which is a critical fuel for the fuel cell industry and the backbone of fuel cell infrastructure. The data gathering and analysis will focus on the following main topics related to infrastructure for fuel cells.

Technical Barriers

This project addresses the following technical barriers from the Education section of the Fuel

Cell Technologies Program Multi-Year Research, Development and Demonstration Plan:

- (A) Lack of Readily Available, Objective, and Technically Accurate Information
- (B) Mixed Messages
- (C) Disconnect Between Hydrogen Information and Dissemination Networks
- (D) Lack of Educated Trainers and Training Opportunities

Contribution to Achievement of DOE Education Milestones

The H2L3 project will directly address the following milestones of the Education sub-program:

- 17: Hold "Hydrogen 101" seminars. (4Q, 2008 through 4Q, 2012)
- 18: Develop end-user workshop materials for use at events. (4Q, 2009)
- 30: Evaluate knowledge and opinion of hydrogen technology of key target audiences and progress toward meeting objectives. (4Q, 2012)

The H2L3 project directly contributes to achieving these milestones by conducting education workshops with hundreds of local and state officials from across the country and, further, by training motivated local officials to replicate the workshops in their own communities. By fostering and using the H2L3 team's existing dissemination network of national associations of local and state government officials, the reach and the credibility of the outreach will be substantially and uniquely strengthened. This dissemination network will continue to pay dividends to DOE beyond the three-year life of this project by establishing institutional relationships that will enable on-going and expanding opportunities for hydrogen outreach through the national associations representing local and state officials.

Accomplishments

- Core Curriculum
 - Comprehensive, basic presentation developed to communicate with audiences of state and local officials.
 - Curriculum trimmed or modified to tailor further for specific audiences as needed.
- Advisory Committee of Local and State Officials
 - Established an advisory committee comprised of Public Technology Institute members (local),

- National Association of State Energy Officials members (state) to review the curriculum and provide input.
- Peer Presenters
 - Identified four different peer presenters who have been or will be utilized to help spread the information in the curriculum to other local leaders.
- Hydrogen 101 Workshops
 - Held three workshops so far at annual national meetings of the Public Technology Institute and National Association of State Energy Officials.
- U.S. Market Report: Hydrogen and Fuel Cells
 - Completed aggressive schedule of research covering 57 different sectors of the hydrogen and fuel cell industries.
 - Peer reviewed, endorsed by the National Hydrogen Association (NHA), published www.hydrogenassociation.org/marketreport.
 - Over 45,000 downloads of the report over three months so far.
- Hydrogen Learning for Local Leaders Breakfast at NHA Conference with the California Fuel Cell Partnership
 - Informal networking breakfast targeted to southern California local leaders.
 - Used an unconventional, non-presentation-based approach by mingling experts with local leaders to create intimate conversations.
 - Very successful. Allowed questions to emerge organically and multiple future opportunities.
- Hydrogen Business Solutions Forum at NHA Conference
 - Peer-to-peer series of presentations presented by current users of fuel cells for current and potential users of fuel cells.
 - www.hydrogenconference.org/h2fcForum.asp
- Hydrogen Student Design Contest
 - Challenged teams of university students from around the world to plan and design the basic elements of a hydrogen community in Santa Monica, CA.
 - 32 teams registered, 12 submitted designs.
 - Three winning teams presented designs at NHA Hydrogen Conference and Expo in Long Beach, CA.
 - One winning team presented at the World Hydrogen Energy Conference in Essen, Germany.



Introduction

Increasing education about hydrogen and fuel cells is a key need to enable widespread commercialization and in many cases the introduction of the related technologies. This project began with a focus on educating local leaders and has developed to include other ways to reach new audiences with educational and information tools that increase knowledge about hydrogen and fuel cells.

Approach

Activities include Hydrogen 101 in-person presentations, Webinars, the creation of a market report that features industry data not published before, the creation of a business solution forum for existing and potential hydrogen customers and a student contest to engage university students to design a hydrogen community in southern California.

Results

For brevity's sake here is a summary of select results:

For the Hydrogen 101 presentations, through several different venues connected with the Public Technology Institute and the National Association of State Energy Officials, local leaders have been engaged from the following areas:

- Cincinnati Health Department
- City of Boston Environment Dept.
- City of Carlsbad, CA
- City of Cincinnati, OH
- City of Culver, CA
- City of Dayton, OH
- City of Des Moines, IA
- City of Fort Wayne IN
- City of Fort Worth, TX
- City of North Kingstown, RI
- City of Orlando, FL
- City of Phoenix, AZ
- City of San Diego, CA
- City of Santa Monica, CA
- City of South Sioux City, NE
- City of Wilmington, NC
- City of Winston-Salem, NC
- District of Washington, D.C.
- Fairfax County Dept. of Vehicle Services, VA
- Los Angeles County, CA
- Regional Governmental Services of CA
- San Diego County, CA

Feedback from attendees Hydrogen 101:

- “Very understandable”
- “For the first time, I understood what hydrogen is.”
- “Personally, I’m not that interested in this [topic] but my boss needed me to learn about it and now I won’t be totally lost.”
- “This was really good.”
- “Really informative.”
- “Showing the number of fueling stations made it real. I thought hydrogen was more of an impossibility before.”

Regarding the U.S. Market Report: Hydrogen and Fuel Cells, the report includes dozens of pages of results covering 57 different research areas. The full report and 8-point brief (see Figure 1) can be viewed

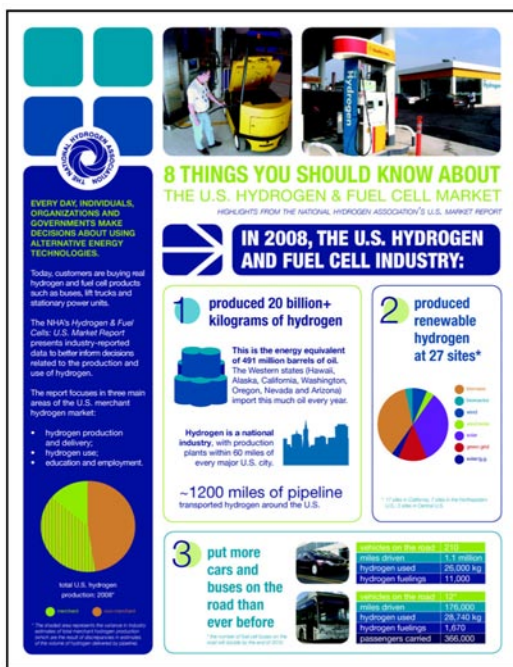


FIGURE 1. The 8-point brief of the U.S. Market Report: Hydrogen and Fuel Cells <http://hydrogenassociation.org/marketreport/pdf/brief.pdf>

TABLE 1. April-July downloads of the U.S Market Report: Hydrogen and Fuel Cells from the NHA Web Site <http://hydrogenassociation.org/marketreport/>

Month	Visits to web page	Downloads - Brief	Downloads - Executive Summary	Downloads - Full Report
April	831	2,410	153	23,976
May	192	324	151	8,577
June	569	193	108	6,212
July (to date)	263	62	43	3,477
TOTAL	1,855	2,989	455	42,242
TOTAL DOWNLOADS (15July10)			45,686	

and downloaded from: <http://hydrogenassociation.org/marketreport>. As of July 2010, the report has become the most popular download on the NHA Web site (see Table 1).

Accolades for the U.S. Market Report: Hydrogen and Fuel Cells

- “It’s outstanding and will be a very useful resource for the community. NHA should be proud to put our logo on your work.... Thanks for the chance to review this impressive document.” – Ken Schultz, Operations Director, Energy Group, General Atomics.
- “Lot of great data. I had no idea that there are so many renewable projects.” – Sandy Thomas, former President, H2Gen Innovations.
- “A really good report. I think the front sections will make a great reference tool on the hydrogen industry generally and I already learned a few things!” – Lisa Calaghan Jerram, Fuel Cell Today.
- “This is an excellent report. I think it is very useful.” – Dr. Finis H. Southworth, Chief Technology Officer, AREVA NP Inc.
- “I am working on a hydrogen study for the University of Colorado and the Reliability and Sustainability Energy Institute (RASEI). Your US Market report on Hydrogen is great.”
- “Excellent reports - some of the most salient data & information out there, and very well presented.” – Randy Cole, CEO at Renewable Opportunities, Inc, via LinkedIn.
- “Love the 8-point brief. Succinct and direct. Thanks for drawing our attention to it.” – Tom Sperrey, CEO, UPS Systems plc, via LinkedIn.
- “The brief version is my kind of report! The full version looks very useful; many thanks for sharing the link.” – Graham Cooley, CEO at ITM Power Plc, via LinkedIn.
- “Very well done and very much needed!” – Bay Elliott, EVP, Partner, Executive Recruiter, The Farwell Group, via LinkedIn.

- “Is it possible to obtain a copy of your report in a non-pdf format? I would like to utilize some of the graphs and figures regarding H2 Energy in an internal slide presentation. If not the whole study, specifically pages 26-37” – from an industrial gas supplier (obviously a significant compliment if they’re happy using this information internally).
- “These are very nice reports. I circulated them within Proton.” – Mark Schiller, VP Business Development, Proton Energy Systems.
- “You and your team did an excellent job. Congratulations!” – Patricia Irving, Ph.D., President & CEO, InnovaTek, Inc.
- “This looks really, really nice. Thank you. I’ve started teaching the graduate course at Wayne State University in alternative energy, and I plan to share this report with my class, as well as working it into my thinking about price and market position. Thank you again, and good luck with your work.” – Robert Buxbaum, President, REB Research & Consulting.

The 2010 Hydrogen Student Design Contest challenged teams of university students from around the world to plan and design the basic elements of a hydrogen community in Santa Monica, CA. They were asked to design one scalable hydrogen fueling station; identify renewable hydrogen sources in the community; and identify customers for early market hydrogen applications.

University teams from the United States, Canada, Bangladesh and Ukraine submitted contest entries. These entries were evaluated across ten different categories by a team of judges from government and industry.

The team from Missouri University of Science and Technology was declared the Grand Prize winner (see team photo, Figure 2). Teams from the University of



FIGURE 2. The Hydrogen Student Design Contest’s 2009-10 grand-prize winning team: Missouri University of Science and Technology, <http://www.hydrogencontest.org/>

Waterloo and the National University of Kyiv received Honorable Mention awards.

Conclusions and Future Directions

The feedback we have received through this project has been overwhelmingly positive. Where improvements have been suggested, adjustments have been made to improve the experience for any audience being education. Going forward, we recommend continuation of the Hydrogen 101 presentations, an expansion of the Market Report to include the next year’s data to show trends and future Hydrogen Student Design Contests.

FY 2010 Publications/Presentations

1. “Hydrogen Transportation Fuel Innovations and Progress”, presented at the NASEO Annual Meeting, September 13–16, 2009, Annapolis, MD, <http://www.naseo.org/events/annual/2009/presentations/Smith.pdf>.
2. Bromaghim, G., Gibeault, K., Serfass, J., Serfass, P., Wagner, E., “U.S. Market Report: Hydrogen and Fuel Cells,” March 2010, <http://hydrogenassociation.org/marketreport>.
3. Bromaghim, G., Gibeault, K., Serfass, J., Serfass, P., Wagner, E., “Brief for the U.S. Market Report: Hydrogen and Fuel Cells,” March 2010, <http://hydrogenassociation.org/marketreport/pdf/brief.pdf>.
4. Hydrogen Business Solutions Forum, May 3, 2010 in conjunction with the NHA Hydrogen Conference and Expo in Long Beach, CA, <http://www.hydrogenconference.org/h2fcForum.asp>.
5. The Opportunities Hydrogen Offers Your Community: A PTI Webinar, <http://www.pti.org/index.php/ptiee1/inside/C67#614>.