

X.11 VA-MD-DC Hydrogen Education for Decision Makers

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Project End Date: September 30, 2011

Objectives

The goal of the three-year project is to increase a targeted audience's understanding of hydrogen and fuel cells, including early market applications, and to provide specific examples of actions that the targeted audience - state and local government leaders - can take to support the development and use of hydrogen and fuel cell technology leading to better understanding of the community benefits that can result. The main objectives of the two-year project are to:

- Conduct a dozen workshops by technical experts and professional educators.
- Produce video resources for public television, seminar use, and DOE/general public.
- Use hardware demonstrations when possible and provide real-world examples of technology.
- Produce electronic "magazine" articles on hydrogen technology demonstrations and other instructional project deliverables.

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
- (B) Mixed Messages
- (C) Disconnect between Hydrogen Information and Dissemination Networks
- (D) Lack of Educated Trainers and Training Opportunities
- (F) Difficulty in Measuring Success

Contribution to Achievement of DOE Education Milestones

This project will contribute to achievement of the following DOE milestones from the Education Technical Plan (3.9) section of the Fuel Cell Technologies Program Multi-Year Research, Development and Demonstration Plan:

- Milestone 17: Hold "Hydrogen 101" seminars. (4Q 2008 through 4Q, 2009)

Accomplishments

The following has been accomplished from July 2009 – June 2010 by Virginia Clean Cities and project partners:

- Developed key partnerships with over 30 different public and private organizations in Virginia/Washington D.C./Maryland to promote the Hydrogen Program and message.
- Conducted two "Hydrogen 101" seminars in Virginia and Washington D.C.
- Finished shooting for and wrapping up production of second year MotorWeek video.
- Completed four of four articles.
- Developed and updated Web site and social media tools (Facebook, YouTube, Twitter).
- Produced two versions of seminar curriculum.
- Held ride-n-drives of Equinox fuel cell electric vehicle and coordinated tour at Shell Hydrogen station in Washington D.C. for local decision makers.
- Published quarterly newsletters.
- Implemented surveys at each workshop.
- Developed draft for 3-part, 5-hour Web-based curriculum to be live Webcast and recorded for archiving.



Introduction

In order to change the way we use energy and to realize the vision of the hydrogen economy, not only will research and development need to persist by engineers and scientists, but decision makers will need to make informed public policy decisions and continue to support research and development as well as deployment activities. This project aims to raise awareness of hydrogen and fuel cell technologies, provide examples of what state and local government can do, and show how decision makers can support the development and use of hydrogen and fuel cell technologies.

The objectives of this project are to provide hydrogen and fuel cell technology learning opportunities through seminars, multi-media and video resources, technical support, and demonstrations to local and state government and decision makers in order to help state and local government leaders become familiar with hydrogen and how it fits in the portfolio of near-term and long-term energy choices, develop an accurate understanding of hydrogen safety, recognize opportunities, and understand their part in facilitating use of hydrogen and fuel cell technologies.

Approach

Our primary approach is to host in-person and Web-cast seminars for our target market, state and local governments. Messaging ties to the hydrogen knowledge survey, on which the subprogram objectives and targets are based. Under DOE guidance, existing Hydrogen Education subprogram resources and new contributions by team members are considered. Educational content focuses primarily on a basic understanding of hydrogen properties and the energy security and environmental benefits of hydrogen and fuel cell technologies, but also focuses on more technical subjects related to fuel cells and other modes of hydrogen energy conversion. Special consideration has been given to “following the technology” and resources also concentrate on areas where hydrogen and fuel cells are publicly visible through demonstration projects or early niche market commercialization efforts, such as the Defense Distribution Depot, Susquehanna, PA hydrogen fuel cell forklift project.

Key to state and local government representative education is a broad understanding of how hydrogen supports decision-making on current opportunities and laying the foundation for long-term change. Additionally, providing real-world examples and demonstrations has been a key component of each seminar when demonstrations have been available. Demonstrations and tours such as of the Shell Hydrogen station in the District of Columbia have been well received.

Results

The major achievements over the last year include designing curriculum for and hosting two successful, and highly received seminars to date, completing a shooting schedule and beginning production of a second seven-minute video for seminar use and broadcasting on the Public Broadcasting Service (PBS), developing Webinar curriculum and identifying ways to provide continuing education credit, and developing a university student senior thesis deployment project. Additionally, individuals were interviewed to gather information for four electronic technology demonstration articles, which are now completed and available online for download.

Seminar Results

The curriculum prepared and presented by Dr. Catherine E. Grégoire Padró of Los Alamos National Laboratory at the November 13, 2009 and December 3, 2009 seminars covered the following content:

- Our current energy system
- What is hydrogen and what is a fuel cell?
- Why hydrogen?
- Hydrogen production, storage, distribution, and use
- Environmental, energy and economic implications
- Safety
- The future of hydrogen and fuel cells

At both seminars, a pre- and post-workshop quiz was given by Dr. Padró. The survey consists of 11 questions that were taken directly from the original DOE survey, conducted in 2004 [1]. The idea for choosing these questions was to maintain the standard set of questions to gauge learning and to compare to the 2004 baseline.

MotorWeek “Hydrogen Update” Video

Virginia Clean Cities worked with MotorWeek to shoot footage for the second year video. In addition to footage of many of the manufacturer-prepared vehicles, and early market applications at the 2010 National Hydrogen Association conference, footage also included interviews with leaders of hydrogen and fuel cell focused organizations. The video will likely run around seven minutes, and cover the theme of hydrogen as part of a portfolio of options and discuss early market opportunities.

The video will be completed by September 2010 and is scheduled to air on MotorWeek in the fall of 2010. MotorWeek is available on PBS and the SPEED channel. The first year video is available for viewing on the Virginia Clean Cities YouTube Channel at <http://www.youtube.com/virginiacleancities>.

Conclusions and Future Directions

The seminars that have been held to date have been very well received and the participants' knowledge of hydrogen and fuel cell technology has increased as indicated by the surveys. The next year of this project will focus on the following outputs described below, as well as continuous improvement and increasing attendance through creative dissemination means.

Future Project Outputs

Over the next year, Virginia Clean Cities and partners will:

- Host up to five in-person seminars and Webinars and work with National Education Energy Development to co-host teacher training seminars.
- Complete more “technology profiles”/articles.
- Finish production of a second MotorWeek video.
- Conduct follow-up surveys of participants from past seminars.
- Record and archive several of the seminars to be linked from the Website.
- Continue to update Twitter, Facebook and YouTube.
- Attend events to discuss and promote project and project outputs.

Planning and Improvements

After surveying several targeted individuals, it was confirmed that travel restrictions and time constraints have affected our ability to attract participants at in-person workshops. It is our hope that the Webinars will address this issue. A preliminary outline has been developed and is undergoing review by several experts. Scheduling is being worked on to accommodate main instructors' schedules.

Virginia Clean Cities worked to facilitate the development of a student thesis project at James Madison University. Seniors will begin designing and building a hydrogen fuel cell motorcycle beginning fall semester of 2010. Additionally, the students will develop an education and outreach program to compliment their thesis project.

Key Issues

The main issue relates to extra demands falling on current project participants as well as target audiences over the last year.

FY 2010 Publications/Presentations

1. Catherine Padro PowerPoint for 11/13/09 seminar.
2. Catherine Padro PowerPoint for 12/3/09 seminar.
3. Fact Sheets: Distribution Depot Susquehanna, Pennsylvania Hydrogen Forklift Project, University of Maryland Hydrogen and Fuel Cell Research, Los Alamos National Laboratory Hydrogen and Fuel Cell Research, and South Carolina Hydrogen and Fuel Cell Research, Development, and Deployment.
Chelsea Jenkins PowerPoint for 6/11/10 Annual Merit Review oral presentation.
4. MotorWeek “Hydrogen Update” video.
5. All presentations available at <http://www.hrccc.org/cleaner-transportation-options/hydrogen/hydrogen-seminars/>.

References

1. Hydrogen Knowledge and Opinions Survey, 2004. “Results: State and Local Government Survey” pps. 47-65. Available online http://www1.eere.energy.gov/hydrogenandfuelcells/pdfs/survey_main_report.pdf.