

X.12 State and Local Partnership Building

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Objectives

- Foster strong relationships among federal, state, and local government officials, industry, and appropriate stakeholders.
- Serve as a conduit between the DOE and state and local government decision makers.
- Provide technically accurate and objective information to government decision-makers and identified stakeholders to improve/enhance decision making.
- Increase the knowledge base and improve awareness regarding the use of hydrogen and fuel cells.
- Provide support for hydrogen and fuel cells in early market applications, consistent with DOE's market transformation efforts.

Technical Barriers

This project addresses the following technical barriers from the Education section of the Hydrogen, Fuel Cells and Infrastructure 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 of Measuring Success

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

- **Milestone 17:** Hold "Hydrogen 101" seminars. (4Q, 2008 through 4Q, 2012)
- **Milestone 29:** Evaluate knowledge and opinion of hydrogen technology of key target audit audiences and progress toward meeting objectives. (4Q, 2009)
- **Milestone 30:** Evaluate knowledge and opinion of hydrogen technology of key target audit audiences and progress toward meeting objectives. (4Q, 2012)

Accomplishments

- Identified key stakeholders at the local and state level to expand and strengthen partnerships.
- Performed a preliminary survey of local stakeholders and decision makers.
- Developed resources to analyze potential sites for hydrogen and fuel cell development. Resources include a database of potential sites for technology deployment and a report to detail criteria for the deployment of technologies for transportation, stationary, and portable applications.
- Developed a Web-based virtual regional resource center that provides online information, models and other tools to assist local, state and regional planners quantify the costs and benefits of hydrogen and fuel cell technology at potential sites. Models address environmental value, energy management, renewable hydrogen generation, distributed technology comparisons, and cost/economics of stationary fuel cells.
- Began planning a workshop for outreach to local stakeholders and decision makers.



Introduction

This project assists with the building of partnerships between the DOE, states and municipalities. The Connecticut Center for Advanced Technology, Inc. (CCAT) is implementing a process and structure that provides an opportunity for federal, regional, state, and local involvement to encourage and promote the use

of hydrogen and fuel cell technology. The structure includes leadership by the DOE; the establishment of collaborative meetings, workshops, and briefings to provide information to municipal and state decision makers; the provision of assistance to municipalities for the development of local energy plans; support for state stakeholder groups to implement initiatives in support of state and federal policies; and implementation of strategies to facilitate the deployment of hydrogen and fuel cell systems in the state.

CCAT developed a virtual regional resource center (RRC) that provides online information, models, and other tools to assist decision makers and end users to quantify the costs and benefits of hydrogen and fuel cell technology at potential sites. The RRC will assist local and state planners and decision-makers in identifying potential opportunities. CCAT developed models that assess environmental value, energy management, renewable energy, cost and economics, and comparisons of competing technologies.

Approach

CCAT's approach is to develop resources for hydrogen and fuel cell deployment to aid in the education of state and local decision makers. These resources include online information, models, and tools for potential users to analyze the costs and benefits of hydrogen and fuel cell technology. Coordination and cooperation is sought by both local and state decision-makers in order to introduce hydrogen and fuel cell technology in early market applications. The project uses local "bottoms up" decisions guided by state/regional "tops down" assistance to help reduce conflict, improve state/regional and municipal relations, and provide better solutions to community-based energy problems. Because of the high risk and high capital cost of implementing new technologies, CCAT will also coordinate with local, state, and regional decision makers to identify innovative funding and procurement mechanisms, such as group purchases and corporate tax credits, to encourage market growth, reduce costs, and increase public acceptance.

Results

The major achievement of the project to date was the development of models that assess environmental value, energy management, renewable energy, cost and economics, and comparisons of competing technologies. These models make available information for non-technical and technical audiences, including state and local decision makers and potential end users and will be an integral component of education and outreach efforts. The models are currently under review by the DOE and are described in the following.

Environmental Model

The Environmental Model assesses the environmental benefits of hydrogen and fuel cell applications compared with other conventional technologies. The model can be used to assess potential emissions reductions, including greenhouse gases, using hydrogen and fuel cell technology.

Economic/Cost Model

The Economic/Cost Model assesses potential yearly heating and electricity cost savings when using a commercially available fuel cell for baseload power. The model allows users to assess the economic viability of a fuel cell system.

Energy Management Model

The Energy Management Model assesses the efficiency benefits of stationary fuel cell applications. The model can be used to assess the potential energy savings using a fuel cell to replace conventional electricity generating technologies.

Distributed Technology Comparison

The Distributed Technology Comparison allows a user to compare fuel cells with other distributed energy technologies including microturbines, combustion turbines, reciprocating engines, photovoltaic systems, and wind turbines, based on certain criteria such as installation cost, efficiency, emissions, heat rate, etc .

Hydrogen Generation from Renewable Technology Model

The Renewables to Hydrogen Model assesses wind, photovoltaic and hydroelectric power generation technologies to identify hydrogen production capacities and average cost per kilogram of generated hydrogen from these renewable technologies.

CCAT has also assessed the level of knowledge and opinions of hydrogen and fuel cell technologies of local and state stakeholders to determine the effectiveness of the project implementation. In addition, other tools have been developed including criteria for the deployment of hydrogen and fuel cell technologies and educational videos that will serve to increase the awareness levels of local and state stakeholders.

Conclusions and Future Directions

This partnership effort has successfully created models and tools that will allow for effective deployment of hydrogen and fuel cell technologies in early market applications. Models and tools have been created to facilitate the education of decision makers and end

users as well as the ability to analyze potential sites for hydrogen and fuel cell technology.

Next steps include providing instruction to local and state decision makers on the use of models and tools within the RRC and information on market awareness, regulatory issues, safety, and local energy planning to increase early market applications. CCAT will facilitate the dissemination of information to municipal decision makers and stakeholders, and keep state officials abreast of activities to deploy hydrogen and fuel cell technologies through the use of collaborative meetings and briefings to achieve state goals including energy reliability, security, efficiency, emissions and economic development. CCAT will also provide the information on financial and investment opportunities to encourage market growth, reduce costs, and increase public acceptance.

FY 2009 Publications/Presentations

1. Rinebold, J.M., “2009 DOE Hydrogen Program Review Presentation”, presentation at the 2009 DOE Annual Merit Review and Peer Evaluation Meeting, Arlington, Virginia, May 21, 2009.