

# **OUTREACH ACTIVITIES**

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## **Abstract**

In response to two separate solicitations for Hydrogen Program outreach, SENTECH proposed and was awarded two contracts, a grant through the Oakland Field Office and a cost-shared Cooperative Agreement with the Golden Field Office. Between the two contracts SENTECH has four distinct outreach tasks. These tasks represent both a continuation and extension of on-going outreach activities and newly created activities.

The underlying principal of the outreach activities is to disseminate timely and relevant information on the potential applications of hydrogen energy to as many audiences as possible. The SENTECH outreach activities are designed to reach defined audiences through electronic, written, and oral communications, as determined to be most effective for conveying technical and non-technical information. However, these communications materials are not limited to the audience for which they have been created, thereby enabling the development of a greater portfolio of outreach materials to be used by the Hydrogen Program.

## **Objectives**

The dissemination of information on hydrogen energy is becoming increasingly important as recent technology progress makes hydrogen a realistic energy option. Just five years ago, hydrogen was considered "futuristic." Over the last five years, there have been significant advances in technology development and the formation of strategic partnerships to help bring hydrogen technologies to commercial markets. Further evidence of the real shift in the hydrogen timetable can be found in two recently formed, highly visible international collaborations; the California Fuel Cell Partnership and the Icelandic Hydrogen and Fuel Cell Company Ltd.

These challenges to the notion that hydrogen is a long-term energy option must be accompanied by a more aggressive and comprehensive outreach effort. Recognizing this need for outreach, the Hydrogen Program developed an Outreach and Communication Plan in 1998 based on recommendations of the Hydrogen Technical Advisory Panel. In FY2000, the Hydrogen Program issued two separate solicitations for outreach activities, seeking projects in keeping with the objectives of the Plan.

The outreach activities proposed and now being conducted by SENTECH are designed to complement the research and development work funded by the DOE Hydrogen Program by presenting the technical achievements and validations of hydrogen energy technologies. The activities also raise the visibility of the Hydrogen Program within new audiences, not reached through traditional communication mechanisms and establish communication channels that will enable continued two-way dialog with these audiences in future years. Between the two contract mechanisms, SENTECH has four distinct outreach activities in FY2001.

- Producing two glossy brochures for distribution at two relevant conferences
- Holding ten face-to-face meetings with potential stakeholder organizations not yet involved in the hydrogen community.
- Conducting two educational forums on hydrogen energy for middle school students.
- Designing an Internet database of international hydrogen energy projects.

### **Current Year Progress**

For some of the tasks, SENTECH has picked up where previous work left off, while for other tasks SENTECH has brought new innovative ideas on communication and outreach. In this discussion, a review of the current year progress on each of the four tasks will be presented followed by an overview of future activities within each task area.

All four of the outreach tasks are on track to be successfully completed by the end of the two contract periods.

### **Communication Documents**

SENTECH identified two timely and relevant topics for the production of glossy brochures – the on-site distributed generation and public transit markets for hydrogen energy technologies. These markets represent two near-term applications for hydrogen. The brochures answer the questions of safety, economics and benefits by presenting examples of successful applications of hydrogen in these two markets.

To date, the first brochure on public transit opportunities for hydrogen has been produced (Figure 1) and it was distributed along with other Hydrogen Program materials at the 7<sup>th</sup> National Clean Cities Conference and Expo in Philadelphia, PA in May 2001. SENTECH's Hydrogen

Power exhibit booth was one of approximately 50 booths on display at the conference. It is estimated that 1000 of the glossy brochures were distributed at the conference.



**Figure 1: Inside and Outside of Hydrogen in Public Transit Brochure**

The second brochure on the topic of on-site distributed power applications for hydrogen is in production and will be exhibited at the Tri-Service Power Expo to be held in San Diego, CA in June 2001. Again, the brochure and other program materials will be distributed at the Hydrogen Power exhibit booth.

These two particular conferences were identified for a number of reasons. SENTECH exhibited at the Clean Cities Conference and Expo in 1999 and was the only exhibit dedicated to hydrogen. Since 1999, with the completion of two hydrogen bus demonstrations in Chicago, IL and Vancouver, British Columbia (Canada), there was certain to be more coverage of hydrogen energy in transportation applications. The glossy brochure on public transit applications highlights the demonstration projects and presents additional information on the benefits of hydrogen as is appropriate for the Clean Cities audience.

The second conference was not originally identified in the contract. With the late award of the Cooperative Agreement the proposed conference had already taken place and SENTECH was required to find another appropriate conference for the second brochure. The Tri-Service Power Expo, sponsored by the Department of Defense, appeared to be a good candidate because of its specific fuel cell track and overall emphasis on on-site power. It also met the schedule and cost criteria of the contract. Additionally, the conference provides an opportunity for furthering the cooperation and collaboration of the DOD and DOE on hydrogen energy technologies.

While SENTECH researches the brochure content and sketches the initial concept, Vocon Design of Fairfax Station, VA is responsible for the final design, layout and printing.

## **Industry Meetings**

The industry meeting task is a continuation of a highly successful industry outreach project began in 1995. Although the general format was maintained for the 2001 meetings, SENTECH has chosen to target organizations “outside” of the hydrogen community. Three particular industry segments were identified as candidates: architect/engineering firms, renewable energy firms, and industries considered to be “on-the-fence” because they do not see an investment in hydrogen technologies or infrastructure as being of business interest.

In the first round of meetings, five organizations in Portland, OR were brought together for a round table discussion on hydrogen. The participants in the meeting included TriMet, the transit agency serving Portland and the surrounding counties; Northwest Natural Gas, the primary natural gas utility; Lynn & Associates, an economic development consultancy; Portland Energy Conservation Inc., an energy efficiency off-shoot of the Portland Energy Office; and Wexler Associates, an energy project development firm.

The meeting successfully introduced the participants to the potential of hydrogen energy and helped to identify opportunities for niche hydrogen markets in transportation and stationary applications. As expected, there were concerns, particularly in the cost-benefit and long-term deployment of hydrogen energy technologies. Follow-up with the participants included providing additional background materials and contacts with appropriate hydrogen-related organizations.

The second set of industry meetings was held in Honolulu, HI. Three meetings were held Power Light Corporation, the Governor’s Advisor of Technology Development, and Renewable Energy Enterprise LLC. These organizations are exploring the renewable hydrogen energy option for stationary power applications in Hawaii.

Another 3 to 4 meetings will be scheduled over the next few months to complete the ten required meetings. As with the first two sets of meetings, the location and therefore participants in the meetings may be determined in part by SENTECH private sector business in order to fulfill cost-share requirements of the Cooperative Agreement. Trip reports for all industry meetings held will be prepared along with recommendations on follow-up with the participants.

## **Educational Forums**

The educational forum task is also a continuation of a highly successful education outreach project began in 1995 under the expert leadership of Dr. Robert Reeves, Professor Emeritus, Rensselaer Polytechnic Institute. In the ensuing five years, Mary Rose Szoka de Valladares had evolved the educational forums to their current state.

SENTECH has followed the basic recipe of the previous educational forums but has brought in more outside experts to complement the educational content of the forum and has provided more hands-on opportunities for the students. The first forum, held in conjunction with the annual meeting of the National Hydrogen Association in early March 2001, involved seventy-five students from two District of Columbia public middle schools. In addition to the live hydrogen

chemistry show and laboratory, Dr. George Thomas of Sandia National Laboratories made a presentation on the technological challenges of storing hydrogen. A second feature speaker, Jason Samenow of the Environmental Protection Agency's Office of Atmospheric Programs, gave a presentation on the science of global warming and mitigation options.

The last half of the day was spent rotating through the learning center where the students had a chance to get their hands on some energy-related demonstrations; see the hydrogen chemistry laboratory up close; visit the NHA expo hall; and see the hydrogen fueled vehicles on display. The final activity was a career panel featuring Jeff Serfass, Executive Director of the NHA, Josh Pihl a recent college graduate with a chemistry major, and Linda Ulrich of BMW.

The second educational forum is scheduled for May 30 at Warrenton Middle School in Warrenton, VA. On the agenda will be the hydrogen chemistry lecture and laboratory, a presentation by Jim Ohi of the National Renewable Energy Laboratory on renewable energy technologies, and an extensive learning center where the students, usually numbering 100, will have the opportunity to see hydrogen technologies in action, including a DCH fuel cell and sensor, and the SunBug vehicle from SunLine Transit Agency.

As part of SENTECH's collaborative initiative in hydrogen education, the hydrogen chemistry lecture and laboratory was presented to 25 DC area teachers during the Teacher's Sun Day Program as part of the ASES 2001 Solar Energy Forum on April 21, 2001. SENTECH will continue to find opportunities to collaborate with the organizations involved in the Sun Day program including Florida Solar Energy Center, National Energy Education Development Program, NASA, EPA, Alliance to Save Energy, Department of Education, and many others.

For all schools participating in the educational forums and the Sun Day Program, copies of the Mission H<sub>2</sub> CD-ROM and Teacher's Guide were distributed along with information on the other educational materials produced by the Hydrogen Program.

### **International Hydrogen Project Database**

The objective of this task is to create an electronic database for the Internet that provides access to information on domestic and international hydrogen energy research, development and demonstration activities. At present, there is no single source for such information. The International Energy Agency's Centre for the Analysis and Dissemination of Demonstrated Energy Technologies (CADDET) has two energy technology databases, CADDET-EE for energy efficient technologies and CADDET-RE for renewable energy technologies. Hydrogen energy technologies are excluded from these databases because they are not yet commercially available and there is uncertainty as to where hydrogen would fit. However, because several hydrogen energy technologies are on the verge of commercialization and many others are in the later stages of research and development, SENTECH has undertaken the creation of a database modeled on the CADDET databases but specific to hydrogen energy technologies.

SENTECH has partnered with Breakthrough Technologies Institute (BTI) on this project. BTI brings to the project expertise in the development of electronic databases and websites. BTI's role is to create a searchable database using Microsoft Access. SENTECH's role is to research

projects for the database, create the website including securing the website domain, and uploading the database to the website.

SENTECH purchased the website domain name h2world.net and created a website logo (Figure 2). The program ColdFusion was selected as the interface between the database and Internet. SENTECH consulted with David Warner of NREL and David Pegg of AEA Technology (London), both of whom are involved in the CADDET databases for a recommendation on software for the database and upload. The recommendation was for Microsoft Access and ColdFusion. SENTECH has purchased ColdFusion and will be taking a training course the end of May.



**Figure 2: Website Logo**

SENTECH has developed the website format, incorporating photos and links to other websites to make the database site a one-stop-shop for hydrogen energy information. The launch date for the website will be in July 2001. At that time, SENTECH anticipates having a minimum of 35 international hydrogen energy projects in the database.

### **Future Plans**

It is SENTECH's intent to seek continued funding for further development of the international hydrogen project database. The Cooperative Agreement with Golden Field Office is renewable for up to three years and future work will be proposed if funding is available.

### **Communication Documents**

SENTECH proposes to take the two brochures produced in FY2001 and develop collateral topical workshops and or multi-media products. Additionally, SENTECH proposes to exhibit the Hydrogen Power booth at other relevant conferences to distribute the brochures, Hydrogen Program materials, and other informational materials produced by SENTECH and others.

## **Industry Meetings**

SENTECH proposes continuing to target industries not currently involved in the hydrogen energy community but that have a stake. The ultimate end-point will be to facilitate the formation of teams to implement hydrogen energy projects. Groups not previously involved in the industry meetings are the environmental groups and community advocacy organizations. They represent a valuable and effective vehicle for educating the general public.

## **Educational Forums**

SENTECH proposes to elevate the educational forums to a regional and then national level by utilizing telecommunications technology, particularly the Internet. Future forums may take place in large venues, such as at a college or a university, to take advantage of location and facilities, and to bring in more distinguished speakers. As the forums grow in substance and audience, they will be broadly publicized through appropriate media channels.

## **International Hydrogen Project Database**

SENTECH proposes to further develop the website and update the information contained in the database to keep up with new and evolving projects. Based on initial feedback, modifications will be made as necessary to the search functions, data display, and website features.

SENTECH will also look for opportunities to further collaborate with the IEA and perhaps eventually integrate the hydrogen database with the existing CADDET database at some point in the future.

## **Acknowledgments**

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