

# DOE Hydrogen Program Education Overview

IPHE Education Task Force Meeting  
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# DOE Hydrogen Education – Program Status

- |                       |                                                                |
|-----------------------|----------------------------------------------------------------|
| <b>January 2003</b>   | Hydrogen Fuel Initiative Launched                              |
| <b>June 2003</b>      | New plan released for DOE hydrogen education effort            |
| <b>September 2004</b> | New projects awarded to support DOE hydrogen education efforts |

FY2005 DOE hydrogen education budget – \$0

FY2006 DOE hydrogen education budget request – \$1.8M

# DOE Hydrogen Baseline Survey

- National, statistically-valid survey
- Key players – ORNL and Opinion Research Corporation
- Four target audiences surveyed – public, state and local governments, large-scale energy end-users, students
- Included technical knowledge questions, opinion questions, and audience specific questions
- Literature review published October 2003
- Surveys will be repeated in 2007/08 and 2010/11

## **Sample Findings:**

- In every population, people who know the least about hydrogen have the most fear about hydrogen safety
- 37% of the public surveyed think hydrogen gas is toxic; 41% think hydrogen is too dangerous for everyday consumer use
- Nearly 60% of the students surveyed are not familiar with the term “hydrogen economy”

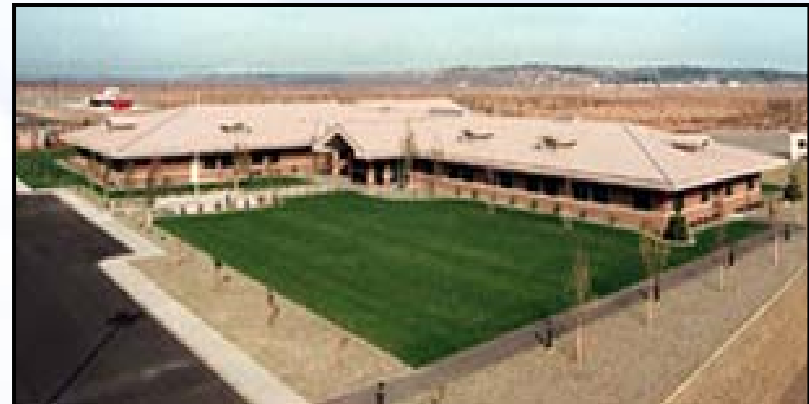
***Final, peer-reviewed report expected in August***

# DOE Education Strategy – Target Audiences

Target Audience	Priority	Notes/Rationale
Safety Officials	Near-Term	Need hands-on training to understand how to handle potential incidents associated with validation projects now; also facilitate local government project approval
Code Officials	Near-Term	Must be familiar with H <sub>2</sub> to facilitate permit process for technology validation projects
State and Local Government Representatives	Near-Term	Must understand near-term realities of H <sub>2</sub> technology to make sound decisions on current opportunities now and lay foundation for long-term change
Local Communities	Near-Term	Community resistance, based on lack of understanding about H <sub>2</sub> technology, threatens implementation and success of near-term projects
University Faculty and Students	Near-Term	Current interest is high; educated students needed for near-term research in government, industry, and academia
Other Teachers and Students	Long-Term	Long-term role in H <sub>2</sub> economy but interest (now) is very high; teachers are looking for technically accurate information and assistance with classroom lesson plans and activities

# Planned FY06 Education Activities – Safety and Code Officials

- Conduct train-the-trainer first responder “awareness-level” courses; begin development of web-based distance learning
- Initiate development of first responder “operations-level” curriculum
- Develop code enforcement course, conduct pilot, and modify course as necessary
- Develop web-based “introduction to hydrogen safety” module



**Volpentest HAMMER Facility – Richland, WA**

→ A unique facility specializing in hands-on training; also offers classroom training and distance learning

→ DOE owned, used by both public and private sector

→ ***For H<sub>2</sub> courses under development:***  
The International Code Council has offered to pay for emergency responders from various states to participate in pilot courses and provide critique

## Planned FY06 Education Activities – State and Local Government Officials

- Conduct second round of one-day “Hydrogen 101” training workshops for state and local government officials – up to 12 events nationwide
- Develop and implement pilot “Hydrogen Energy Institute” (a more intensive, “Hydrogen 201” course for state government officials)

### ***Baseline Survey Statistics – State and Local Government Officials:***

*→ Achieved the highest scores on 11 technical knowledge questions, but nearly 90% still feel a Hydrogen 101 workshop would be helpful*

*→ The source of information used most frequently to make energy-related decisions is the Federal government*

## Planned FY06 Education Activities – Local Communities

Develop and implement targeted outreach activities where technology validation projects are located (where hydrogen fueling stations will be constructed); activities would be developed with industry partners

- Print, radio, and TV “spots” to introduce the vision of a hydrogen economy and inform local residents of where they can find more information
- Community seminars to educate local residents about the vision of a hydrogen economy and address the facts about hydrogen safety

### ***Baseline Survey Statistic – General Public:***

*When asked how they'd feel if their local gasoline station also sold hydrogen, more than 50% said they'd feel frightened, uneasy, or “don't know”*

# Planned FY06 Education Activities – University Faculty and Students

## University Hydrogen Technology Learning Centers

- Undergraduate and graduate courses
- Short courses/seminars for local community – government officials, business executives, other key stakeholders

### **H2USA**

- University of Central Florida
- Rochester Institute of Technology
- University of California-Davis
- San Diego-Miramar College

### **Regional Hydrogen Technology Education Consortium**

- North Carolina A&T
- University of South Carolina
- University of Georgia
- University of Florida

### **Virginia-Maryland Hydrogen Education Center**

- Virginia Tech
- University of Maryland-College Park



# Activities for University Faculty and Students, continued

## Web-based resources

[www.eere.energy.gov/hydrogenandfuelcells/education](http://www.eere.energy.gov/hydrogenandfuelcells/education)

- Textbook catalog
- Database of U.S. college and university programs

## University Student Design Competition

The National Hydrogen Association's

### **2006 H2U Student Design Contest**

Applications for Hydrogen Storage

[www.H2Ucontest.org](http://www.H2Ucontest.org)

- Students develop and design a hydrogen application
  - 2004 – Fueling Station
  - 2005 – Power Park
- Winning teams present design to industry at Annual Hydrogen Conference
- Guidelines and rules for 2006 contest expected early September

## Planned FY06 Education Activities – Teachers and Students

- Develop and distribute high school and middle school curricula (lesson plans and hands-on activity kits)
- Develop and implement teacher professional development (teacher training opportunities paired with distribution of curricula packages)

### ***Baseline Survey Statistic - Students:***

- *Students answered only 32% of the knowledge questions correctly*
- *Almost 40% of students think hydrogen gas is toxic*
- *Almost 50% of students think hydrogen is too dangerous for everyday public use*

### **Other resources – [www.eere.energy.gov/hydrogenandfuelcells/education](http://www.eere.energy.gov/hydrogenandfuelcells/education)**

- Student activities, links to other educational resources
- Information on student competitions

# Resources

## New educational materials

- Hydrogen fact sheets
- Hydrogen technology overview book
- Fuel cell technology overview book and brief

## New DOE Hydrogen Program documents

2005 Annual Progress Report – November 2005

## DOE Hydrogen Program Website

[\*www.hydrogen.energy.gov\*](http://www.hydrogen.energy.gov)

## Information Clearinghouse

[\*877-EERE-INFO/877-337-3463\*](tel:877-EERE-INFO)

## On-line Catalog

[\*www.eere.energy.gov/hydrogenandfuelcells/resources.html\*](http://www.eere.energy.gov/hydrogenandfuelcells/resources.html)