



U.S. Department of Energy
Energy Efficiency and Renewable Energy

DOE Hydrogen Program 2004 Annual Program Review



Education Overview

Christy Cooper - May 27, 2004



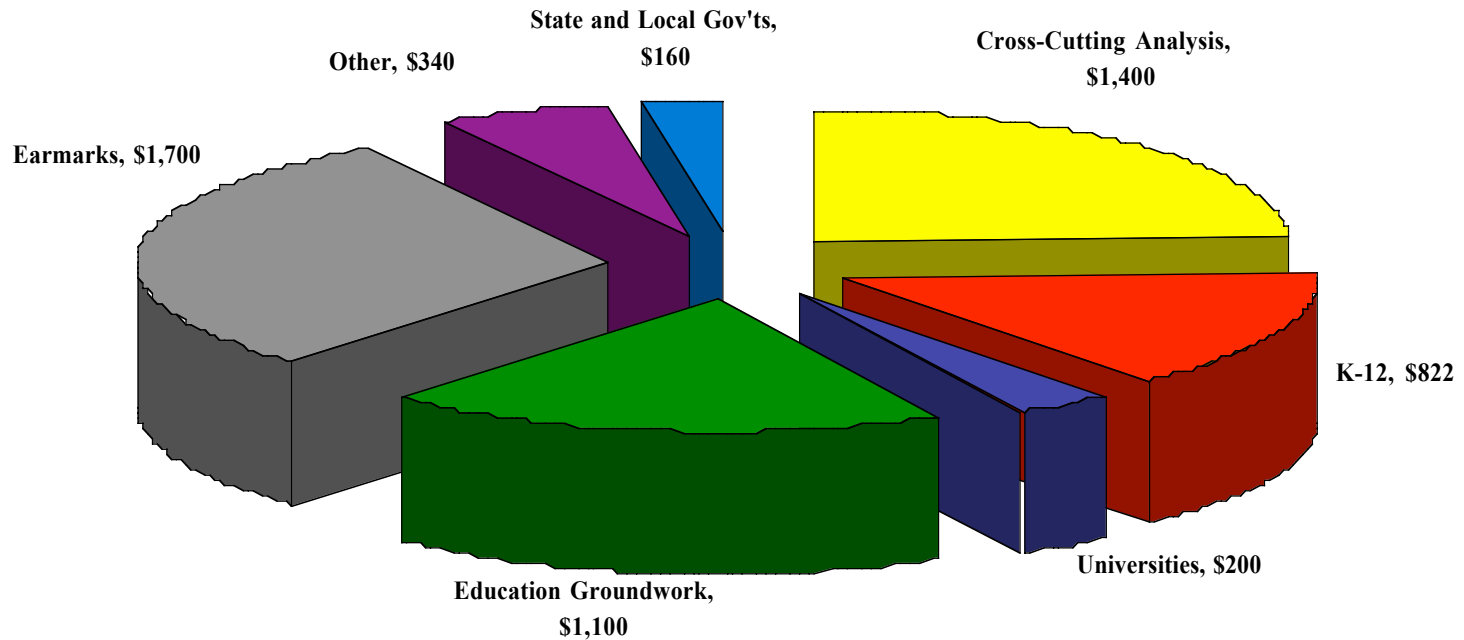
By 2010 –

- _ Achieve a fourfold increase in the number of *students and teachers* who understand the concept of a hydrogen economy and how it may affect them
- _ Achieve a fourfold increase in the number of *state and local government representatives* who understand the concept of a hydrogen economy and how it may affect them
- _ Achieve a twofold increase in the number of *large-scale end-users* who understand the concept of a hydrogen economy and how it may affect them
- _ Launch a comprehensive and *coordinated public education campaign* about the hydrogen economy and fuel cell technology

www.eere.energy.gov/hydrogenandfuelcells/mypp/pdfs/3.8_education.pdf



FY2004 – Education and Cross-Cutting Analysis: \$5.71M



FY2005 Request: \$7M (Education, \$4.5M, Analysis, \$2.5M)



The Challenge:

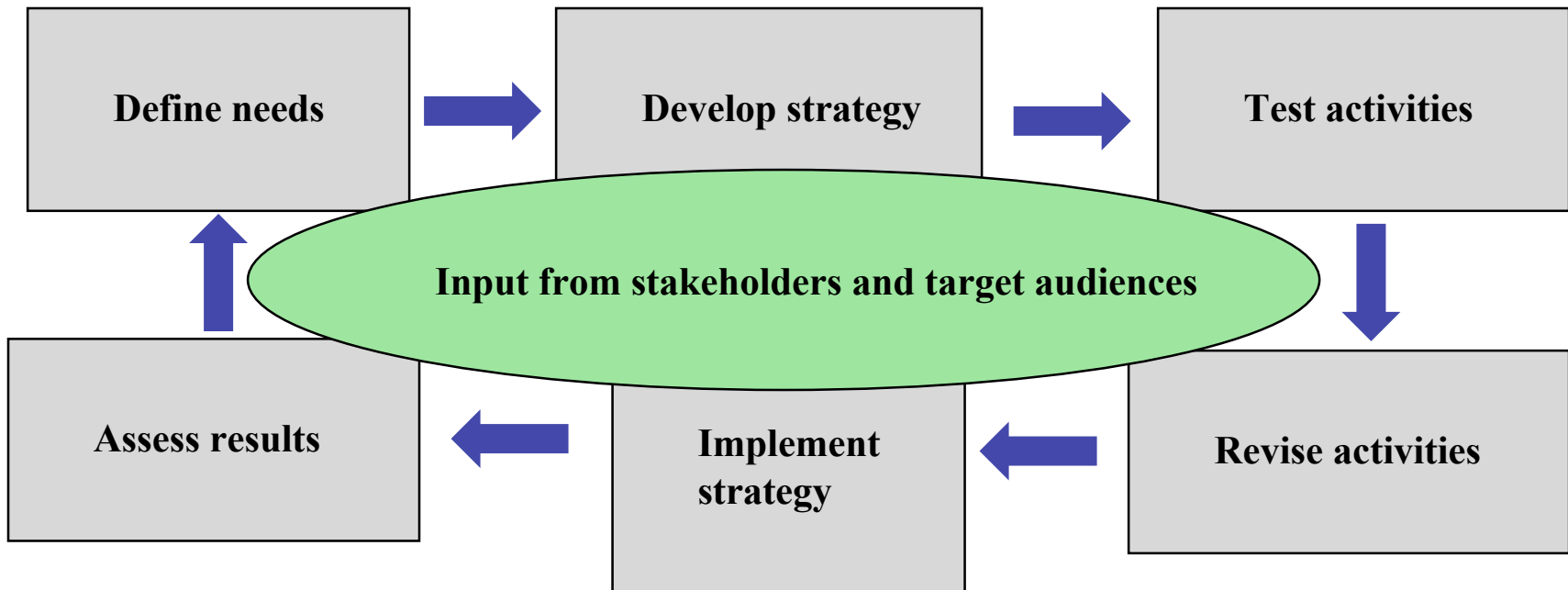
That the hydrogen economy is a revolutionary change from the world we know today is the fundamental challenge to hydrogen education.

Barriers

- A. Lack of awareness
- B. Lack of demonstrations or examples of real-world use
- C. Institutional barriers and access to audiences
- D. Regional differences

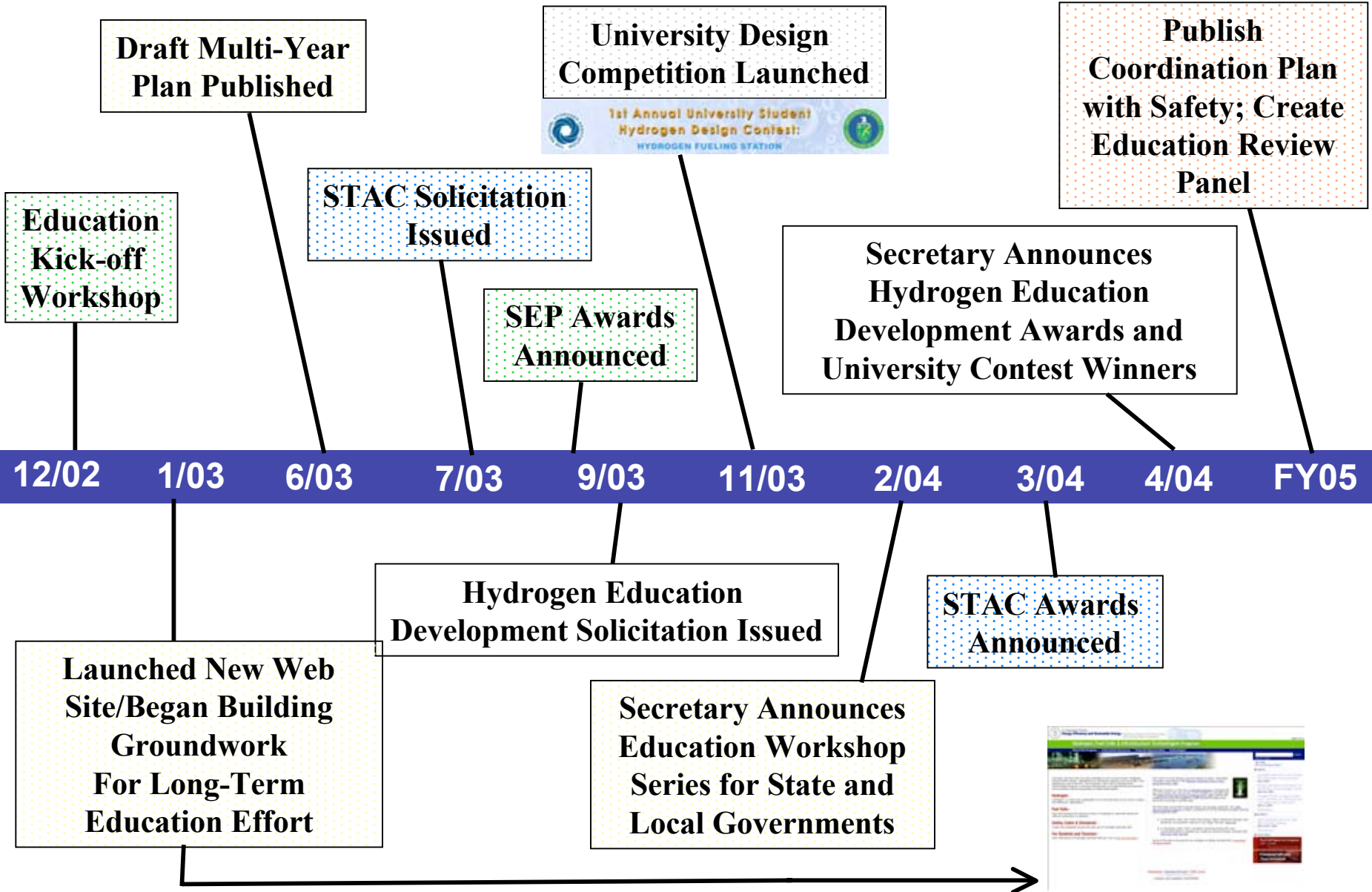


- Build foundation for long-term education campaign and specific activities that cross-cut target audiences
- Consider timing of technology market-readiness; focus initial efforts on target audiences critical to near-term demonstrations and audiences whose buy-in requires sustained education





Education Planning/Implementing Timeline





Education Groundwork

Baseline knowledge assessment

- ✓ **Related milestone: Establish baseline level of public awareness and perceptions**
 - Published required Federal Register Notices in August 2003, January 2004
 - Developed and tested survey questions for all target audiences (public, students and teachers, state and local governments, and large scale end-users) by March 2004
 - Received OMB approval of public survey, March 2004; other survey approvals pending

Launched new hydrogen/fuel cell hotline as part of EE information center – 877-EERE-INF(O)

- ✓ **Related milestones:**
 1. Identify opportunities to tie into existing clearinghouse infrastructures
 2. Establish information clearinghouse
 - EERE Information Center went “live” January 1, 2004
 - HFCIT official launch announced at NHA Annual Conference, April 27, 2004

Awarded hydrogen education development solicitation to develop general education materials and co-sponsor conferences and events

- ✓ **Related milestone: Create library of materials**
 - Secretary Abraham announced awards on April 27, 2004
 - Topic 2: Educational Materials – Energy International, Inc.; Anderson Creative Group
 - Topic 3: Co-sponsorship of Conferences and Events – National Hydrogen Association, Northeast Sustainable Energy Association, University of California-Irvine



K-12 Education

Identify and review existing K-12 hydrogen education materials

- ✓ Related milestone: Identify and review existing teaching materials for grades K-12
 - Developed draft report May 2004

Awarded hydrogen education development solicitation for comprehensive middle school and high school hydrogen technology curricula and teacher professional development program

- ✓ Related milestones:
 1. Identify partners and develop detailed plan for coordinate materials development/teacher training program
 2. Identify and evaluate opportunities to work with traditional textbook companies to incorporate hydrogen and fuel cell information
 - Secretary Abraham announced awards on April 27
 - Project 1: University of California Berkeley (Center for Curriculum Innovation at the Lawrence Hall of Science), AC Transit, Schatz Energy Research Center, Lab-Aids, Inc., Chabot Science Center
 - Project 2: National Energy Education Development (NEED) Project; Sentech, Inc.; Los Alamos National Laboratory, NHA, NASEO, USFCC

Developed middle school activity guide to serve immediate education needs

- Developed lessons in partnership with math and science teachers in DOE's Einstein Fellowship program
- Published guide for distribution at 2004 National Science Teachers Association Convention



University-Level Education

Developed database of university programs and hydrogen fuel cell textbook catalog

✓ **Related milestone/deliverable: Publish database of existing university programs**

- New database will go live with “phase 2 redesign” of program web site, July 2004

Initiated Hydrogen Technology Learning Centers involving 10 schools in 9 states through STAC partnership

✓ **Related milestone: Expand hydrogen and fuel cell focus of DOE university programs**

- Developed through the State Technology Advancement Collaborative, a partnership of DOE, the National Association of State Energy Officials (NASEO), and Association of State Energy Research and Technology Transfer Institutions (ASERTTI)
- Solicitation required multi-state participation; 3 projects awarded – 10 schools in 9 states
- Schools will develop/expand hydrogen fuel cell curricula and create a “center” in which the local community can learn about the hydrogen vision and fuel cell technology

Held first hydrogen design contest for university students

✓ **Related milestone: Expand hydrogen and fuel cell focus of DOE university programs**

- Developed in partnership with the National Hydrogen Association
- Contest concept was to design a hydrogen fueling station; students developed technical specifications for hydrogen production, delivery, storage; conducted safety, economic, and environmental analyses; developed education and marketing plan to build community support/awareness
- 17 schools entered; Secretary Abraham announced winning design by University of Victoria on April 28, 2004



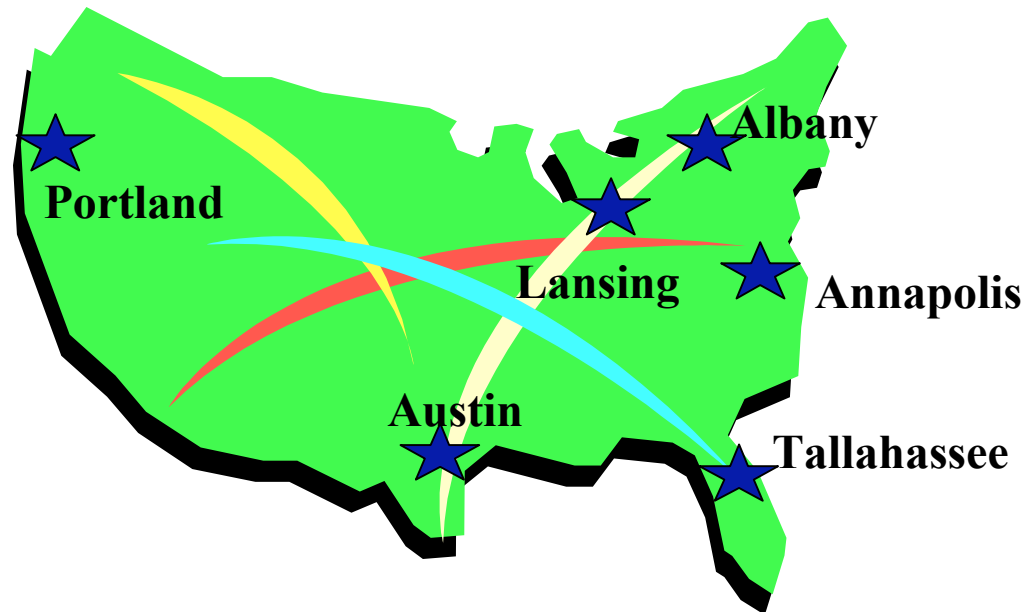
State and Local Government Education

Launched new state and local government education project

- ✓ Related milestone: Implement strategies to coordinate education activities with state and local partners and facilitate information sharing among partners
 - Series of six “Hydrogen 101” workshops (one in each DOE region) is intended to explain the hydrogen vision and the technology behind it (how hydrogen is produced, delivered, and stored; hydrogen safety; how fuel cells work; technical challenges to achieving the hydrogen vision)
 - Workshops bring together DOE HQ and Regional Offices, as well as state and local partners
 - Secretary Abraham announced the series in a press conference in Lansing, MI on February 19

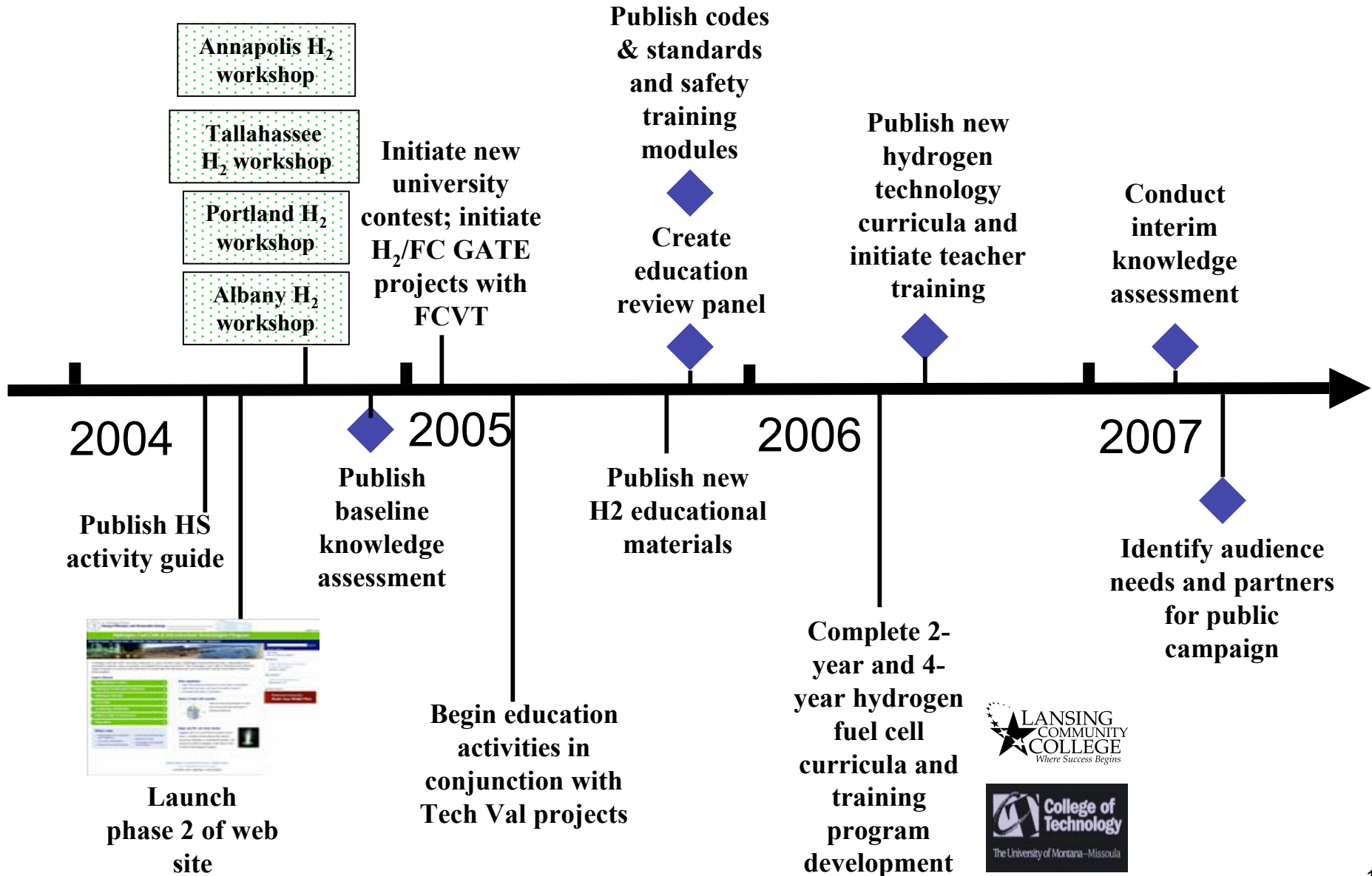
Event dates

- Lansing, MI – March 23
- Austin, TX – April 16
- Albany, NY – June 8
- Portland, OR – July 9 (TBD)
- Tallahassee, FL – TBD
- Annapolis, MD – September 8





Future Work/Key Milestones





For more information –

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