



U.S. DEPARTMENT OF
ENERGY

Technology Validation

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**2007 DOE Hydrogen Program
Merit Review and Peer Evaluation Meeting**

May 15, 2007



Outline

- Goal and Objectives
- Budget
- Challenges
- Progress
 - Accomplishments/Status
- Future Plans



Goals and Objectives

Technology Validation: Validate complete systems of integrated hydrogen and fuel cell technologies for transportation, infrastructure and electricity generation applications under real-world operating conditions

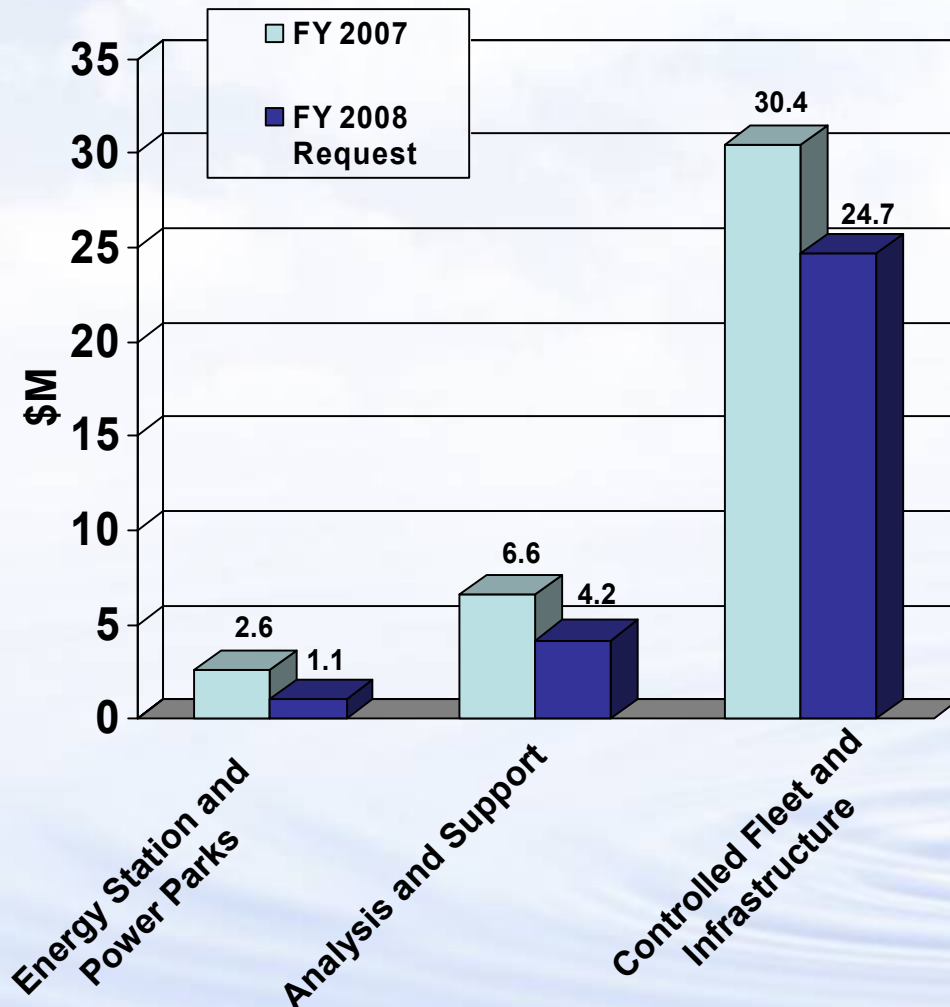
- Validate H₂ FC Vehicles and Infrastructure in Parallel
- Identify Current Status of the Technology
 - Assess Progress Toward Technology Readiness
 - Provide Feedback to H₂ Research and Development



Technology Validation

FY 2008 Budget Request = \$30.0M

FY 2007 Appropriation = \$39.6M



FY 2008 Emphasis:

- All Gen 2 vehicles and fueling stations in operation using advanced technology hardware to meet program objectives.
- Continue analysis to verify 2,000 hour fuel cell durability target by 2009
- Install equipment and collect data to meet \$3.00/gge by 2009
- Collect vehicle operational and maintenance data and conduct dynamometer testing to evaluate fuel cell performance and range

FY 2008 Budget Plan:

Demo – Infrastructure	\$10.2M
Demo - Vehicle	\$14.5M
Other Industry/Lab	\$ 5.3M
Total	\$30.0M



Challenges

- Lack of fuel cell vehicle performance and durability data
- Lack of refueling infrastructure performance and availability data
- Need to assess fuel cell start-up and operation in 3 different climatic conditions
- Determine fuel cell vehicle and infrastructure interface issues that need to be addressed



Generation 2 Vehicles Being Delivered in 2007





Progress

DOE Vehicle/Infrastructure Demonstration:

- **Four teams in 50/50 cost-shared projects:**

- General Motors/Shell
- Ford/BP; Ballard
- Hyundai/Chevron; UTC Power
- DaimlerChrysler/BP; Ballard

Current Status/Data

Fuel Cell Vehicles	77
Hydrogen Stations	12
Fuel Cell Efficiency	53 - 58%
Range	103 -190 miles
Durability	1200 hrs (max) (~36,000 miles)

DOT is demonstrating fuel cell buses and providing data to DOE for analysis.

- Eight buses in California, Massachusetts, New York, South Carolina, and Washington, DC





Future Plans

- Continue testing and operating generation 1 and generation 2 fuel cell vehicles
- Verify
 - 2,000 hour fuel cell durability
 - 250 mile range
 - \$3.00/gasoline gallon equivalent
- Build and operate a biomass energy station
- Build and operate a power park in Hawaii



For More Information

Technology Validation Team

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The screenshot shows the homepage of the U.S. Department of Energy's Hydrogen Program website. The header includes the DOE logo and the text "hydrogen.energy.gov". A navigation bar contains links for Home, About, DOE Participants, International, Library, and News/Events. A search bar is located on the right. The main content area is divided into several sections: a left sidebar with a list of topics (Hydrogen Production, Delivery, Storage, Manufacturing, Conversion/Fuel Cells, Applications/Technology Validation, Safety, Codes & Standards, Education, Basic Research, Systems Analysis, Systems Integration); a central "H₂IQ" section with an "Announcement" about a Peer Evaluation Report; a "News" section with a headline "Independent Review Panels Assess Progress Towards Technical Targets"; a "DOE Announces Hydrogen Funding Opportunity for Small Businesses" section; and a "DOE Loan Guarantee Program Promotes Innovative Technologies" section. On the right side, there are three featured boxes: "DOE Hydrogen Program" with an H₂ logo, "President's Hydrogen Fuel Initiative" with a photo of a man, and "Advanced Energy Initiative" with a star logo. At the bottom right, there is a "FreedomCAR & Fuel Partnership" logo and a link to "Information on Financial Opportunities".

www.hydrogen.energy.gov