
VI.0 Technology Validation Sub-Program Overview

Introduction

The Technology Validation sub-program element is focused on conducting learning demonstrations that emphasize co-development and integration of hydrogen infrastructure in parallel with hydrogen fuel cell-powered vehicles to permit industry to assess progress towards technology readiness. Technology Validation will test, demonstrate and validate total system solutions and use the results to refocus hydrogen R&D as appropriate.

Goal

Validate the status of meeting program targets for integrated hydrogen and fuel cell technologies for transportation, infrastructure and electric generation under real-world operating conditions for both the transition and mature market periods.

Objectives

- By 2009, validate hydrogen vehicles that have greater than 250-mile range, 2,000-hour fuel cell durability and hydrogen infrastructure that results in a hydrogen production cost of less than \$3.00/gge (untaxed), and safe and convenient refueling by trained drivers.
- By 2014, validate \$1.60 (at the plant gate) hydrogen cost from biomass gasification and \$3.10/kg for central wind-based electrolysis at the plant gate.
- By 2015, validate hydrogen vehicles that have greater than 300-mile range, 5,000-hour fuel cell durability and hydrogen infrastructure that results in a hydrogen production cost of \$2.50/gge (untaxed), and safe and convenient refueling by trained drivers.

FY 2007 Technology Status

The Learning Demonstration in 2007 provided data for evaluating the technology status with respect to fuel cell durability, driving range, and power park demonstrations. In addition, stationary fuel cell and electrolyzer subsystem performance were evaluated.

FY 2007 Accomplishments

Hydrogen Learning Demonstration

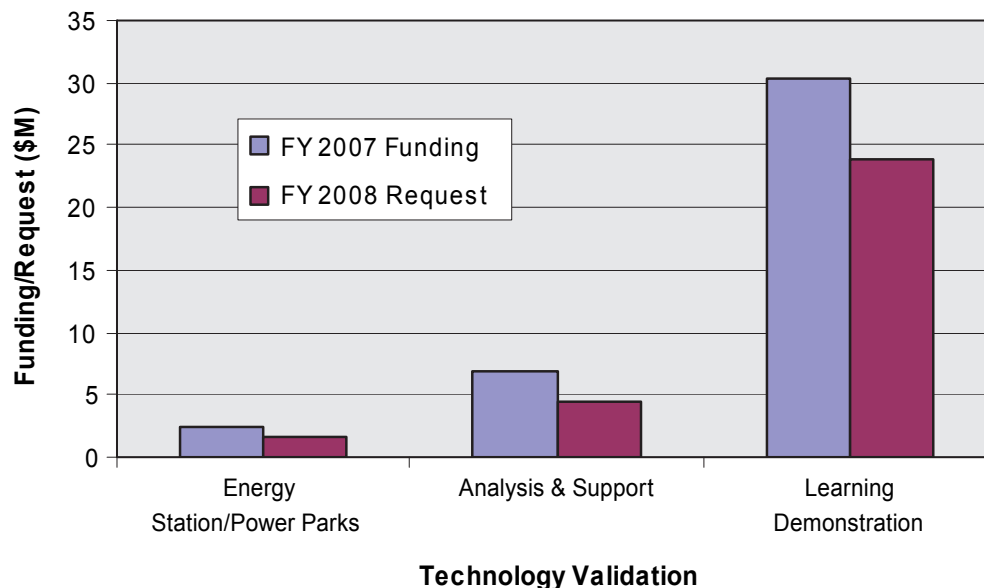
- In FY 2007, generation 1 vehicles continued to be operated by customers, hydrogen refueling stations were installed and operated, and data was provided to the Hydrogen Secure Data Center at the National Renewable Energy Laboratory. Thirty new or updated composite data products were created and published from the data including fuel cell efficiency, fuel economy, fuel cell durability and facility operation incidents.
- Generation 2 vehicles started to be delivered.
- Hydrogen fueling stations continued operations in Washington, D.C. (delivery); LAX Airport, Los Angeles, CA (electrolyzer); Southfield, MI (power park); Oakland, CA (reformer); Chino, CA (reformer); San Francisco, CA (delivery); and Sacramento, CA (delivery). In addition, refueling sites have been opened for operation in Taylor, MI (delivery); Jamestown, FL (electrolyzer); Selfridge, MI (reformer); Detroit, MI (delivery to NEXT Energy) and Rosemead, CA (electrolyzer).

Hydrogen Power Parks

- In FY 2007, continued development of the Hawaii Hydrogen Power Park.
- In FY 2007, site selection and initial plans for construction has been completed for an energy station in California for the production of hydrogen and electricity.

Budget

The funding portfolio for Technology Validation addresses the need to validate integrated hydrogen and fuel cell technologies for transportation, infrastructure, and electric generation in a systems context under real-world operating conditions. The FY 2008 funding profile (subject to Congressional appropriation) addresses key aspects of the Hydrogen Program mission and system integration activities for both fleets and their infrastructure.



FY 2008 Plans

In FY 2008, Technology Validation will continue to add generation 2 vehicles and refueling stations to the project. Refueling stations will include the capability to fuel vehicles at 10,000 psi. The Learning Demonstration will continue to operate generation 1 and 2 vehicles and hydrogen fueling stations to update the composite data products with the most recent data. The data will be collected to support the overall target of 2,000-hour fuel cell durability, >250-mile vehicle range and hydrogen cost of \$3.00/gge in 2009. In FY 2008, a power park will be installed and operated in Hawaii.

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