

# 2010 DOE Hydrogen Program

## *The H-Prize*

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**Project ID: ST086**

This presentation does not contain any proprietary, confidential, or otherwise restricted information.

# Overview

## Timeline

- Start – Sept. 2008
- Finish – Sept. 2011
- ~50% Complete

## Barriers

- Hydrogen storage materials capacity
- Hydrogen storage materials efficiency
- Hydrogen storage materials durability/operability

## Budget

- Total project funding: \$1.3M
  - Administrative: \$300K
  - Prize: \$1M
- DOE share: \$1.3 M
- Contractor share: \$0

## Partners

- Hydrogen Education Foundation, *Project lead*
- Technology Transition Corporation
- South Carolina Research Authority (SCRA)

# Overview:

## About the H-Prize

- Part of Sec. 654, *Energy Independence & Security Act of 2007*
- Congress authorized Secretary of Energy to create a program to competitively award cash prizes to incentivize dramatic research achievements to advance the commercialization of hydrogen energy technologies
- Private contributions can augment government provided prize funds

# Overview:

## H-Prize Categories

1. Advancements in technologies, components and systems (4 prizes,  $\leq$  \$1M), biennial
  - Hydrogen production, storage [the **current prize**], distribution, utilization
2. Prototypes (up to 1 prize every 2 years,  $\leq$  \$4 M)—vehicles or products
3. Transformational technologies (1 competition,  $\geq$  \$10 M + matching funds)—production or distribution

# Overview:

## Initial H-Prize Competition

- A single \$1 M award
- Demonstrating advancement for an on-board storage material exceeding certain performance targets
- Pilot program administered by Hydrogen Education Foundation.
- Announced in Federal Register: Aug. 26, 2009
- Registration deadline: Feb. 15, 2010
- Deadline for receipt of materials: Nov. 15, 2010

# Objectives - Relevance

- Manage the H-Prize competition to create solutions that move hydrogen and fuel cell technology closer to markets
- Create a pilot award process
- Augment H-Prize awards by organizing and managing a comprehensive fund raising program
- Encourage robust contest participation by individuals or teams
- Deploy H-Prize funds through fair and open competition to reward success in addressing critical technical challenges

# Progress and Accomplishments

From May 2009 – June 2010

## **Contest Publicized**

*For publicity and encouraging competitors and sponsors*

- Contest announced in Federal Register: August 26, 2009
- Website launched: [www.hydrogenprize.org/](http://www.hydrogenprize.org/)
- Press release issued: Sept. 2009
- Announcement widely circulated by HEF to materials science and hydrogen community encouraging strong contest registration
  - Targeted universities active in hydrogen storage and materials research
  - Presented and advertised at conferences
  - Leveraged the National Hydrogen Association's wide network

# Progress and Accomplishments

From May 2009 – June 2010

## **Fundraising Outreach**

- Marketing lists and flyers created
- SCRA leading extensive fundraising effort
  - Reached out to more than 200 donors and foundations in ongoing effort, 40% have responded
  - Awaiting approval to participate in the 2010 Combined Federal Campaign



# Progress and Accomplishments

From May 2009 – June 2010

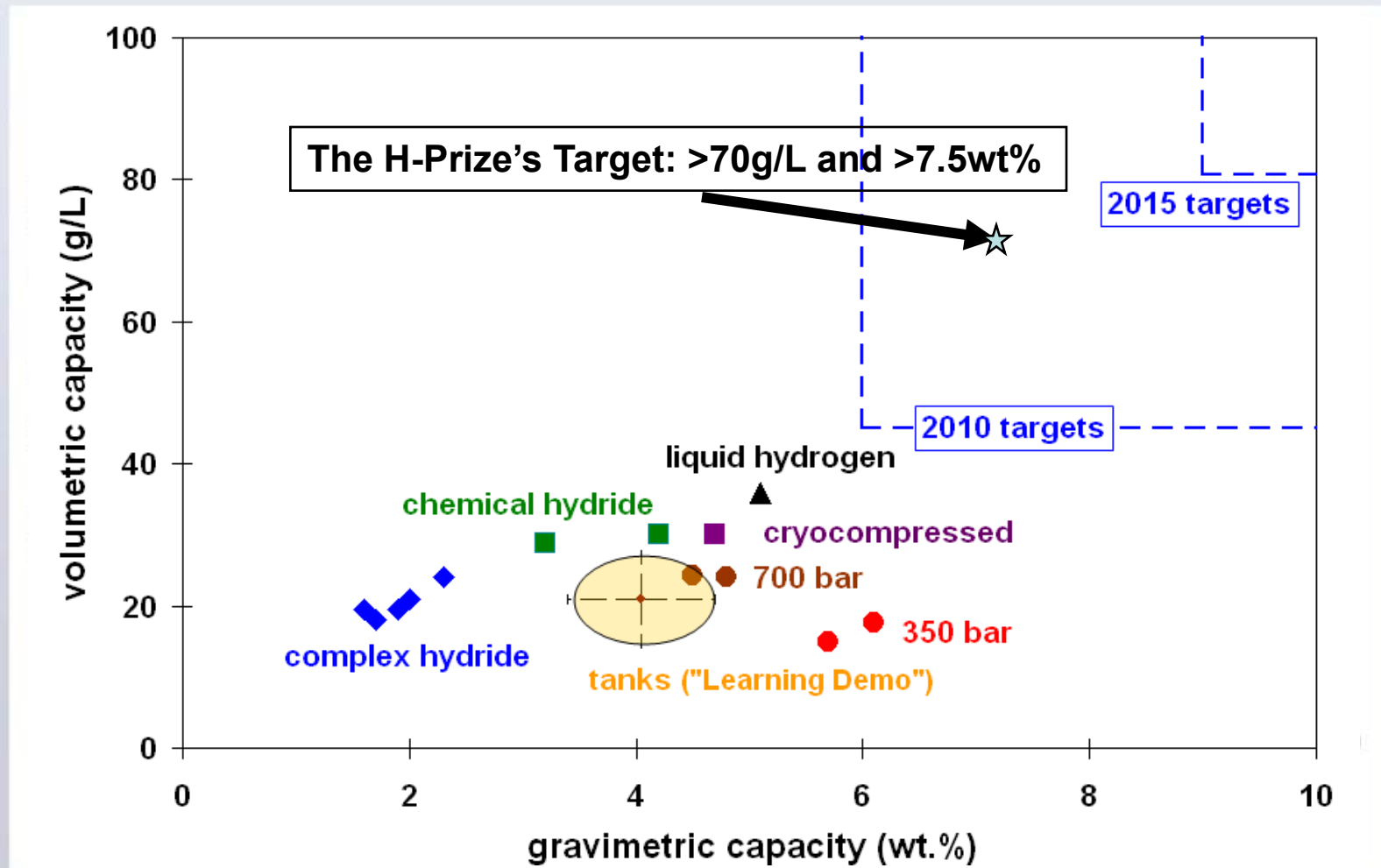
## **Technical Criteria Established**

- Goal for a material with potential for use as an on-board rechargeable hydrogen storage material
- Gravimetric capacity:  $>7.5\text{-wt}\%$ 
  - Reversible H<sub>2</sub> capacity between -40 and +85 degrees C (between 1.5 – 150 bar)
- Volumetric cap  $>70$  g/liter
- Charging kinetics:  $\geq 4 \times 10^{-4}$  g H<sub>2</sub> per g of material per second
- Cycle life: 100 cycles



# Current Status

*No technology meets targets*



DOE Multi-Year Research, Development and Demonstration Plan, April 2009

# Collaborations

- Hydrogen Education Foundation, *Project lead*
- Subcontract with:
  - Technology Transition Corporation
  - South Carolina Research Authority (SCRA)

## **Also collaborating with:**

- The Combined Federal Campaign
- Over 200 private and corporate foundations
- A judging panel of individuals with deep hydrogen storage expertise and various backgrounds
- DOE Hydrogen Program's storage team
- The National Hydrogen Association to gather info and publicize the H-Prize with its broad network of members and industry contacts

# Future Work

For remainder of FY10 and FY11

- Establish judging panel and judging schedule – **June/July 2010**
- Receipt of test results and materials for subsequent independent verification of results – **by Nov. 15, 2010**
- Fundraising efforts and building momentum for future H-Prizes – **completed and ongoing**
- Judging Panel decision on winning entry, if any – **Jan. 2011**
- Disbursement of \$1M prize to winning individual/team, if awarded – **Feb. 2011**

# Project Summary

## **Objective:**

Create a pilot H-Prize, the first of 4 biennial technology components and systems prizes. This first H-Prize focuses on the technical challenges with hydrogen storage materials for vehicular applications.

## **Progress Achieved:**

Schedule and administrative framework established, technical criteria set, contest publicized, official competitors registered and verified, fundraising commenced for future prizes.

**Announced in Federal Register: Aug. 2009**

**Disbursement of prize to winning individual/team, if awarded: Feb. 2011**

# Thank you!

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