DOE Hydrogen and Fuel Cell Activities

Panel Discussion

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The DOE Program has been addressing key challenges facing the widespread commercialization of fuel cells.

**Fuel Cell Cost & Durability**
- Targets*:
  - Vehicles: $30 per kW, 5,000-hr durability
  - Stationary Systems: $750 per kW, 40,000-hr durability

**Hydrogen Cost**
- Target: $2 – 3 /gge, delivered

**Hydrogen Storage Capacity**
- Target: > 300-mile range for vehicles—without compromising interior space or performance

**Technology Validation:**
- Technologies must be demonstrated under real-world conditions.

**Market Transformation**
- Assisting the growth of early markets will help to overcome many barriers, including achieving significant cost reductions through economies of scale.

**Key Challenges**

- **Technology Barriers**
  - Fuel Cell Cost & Durability
  - Hydrogen Cost
  - Hydrogen Storage Capacity

- **Economic & Institutional Barriers**
  - Safety, Codes & Standards Development
  - Domestic Manufacturing & Supplier Base
  - Public Awareness & Acceptance
  - Hydrogen Supply & Delivery Infrastructure

*Metrics available/under development for various applications
DOE Fuel Cell Technologies Program R&D Progress

Program participants have:

Reduced the high volume cost of fuel cells to $61/kW*

- More than 35% reduction in the last two years
- More than 75% reduction since 2002.

More than doubled durability in the last few years

- More than 7,300 hrs in the lab (single cell).
- More than 2,500 hrs (75,000 miles) in DOE Learning Demo vehicles.

Demonstrated adequate driving range

- Up to 254 miles in DOE Learning Demo vehicles. Verified ~430 miles on 1 fill with more recent technology.

Reduced the cost of H₂ technologies

- Met targets for distributed natural gas. Roughly 15-30% cost reductions for delivery, up to 40% cost reductions for H₂ production on track towards long term goals of $2-3/gge.

*Based on projection to high-volume manufacturing (500,000 units/year).
Methodology validated by Independent Panel: $60 – $80/kW is a “valid estimate”: http://hydrogendoedev.nrel.gov/peer_reviews.html
Summary & Questions

- Need to reduce H$_2$ cost (production, delivery & storage)

- Need to sustain R&D (e.g. need both cost and durability) and cross-cutting activities (e.g. safety, codes and standards)

What fuel cell cost is acceptable?
What H$_2$ cost is acceptable?
What are the priorities for RDD&D and in each key area (e.g. BOP, etc.)?

Webinar planned in mid-May to solicit industry input on fuel cell risk analysis activity. If interested contact Sunita.Satyapal@ee.doe.gov or Mark.Ruth@nrel.gov

Note: Costs in analyses assume high volume costs
Thank you

http://www.eere.energy.gov/hydrogenandfuelcells