U.S. Country Update

29th IPHE Steering Committee (SC) Meeting

May 11, 2018 – Kobe, Japan

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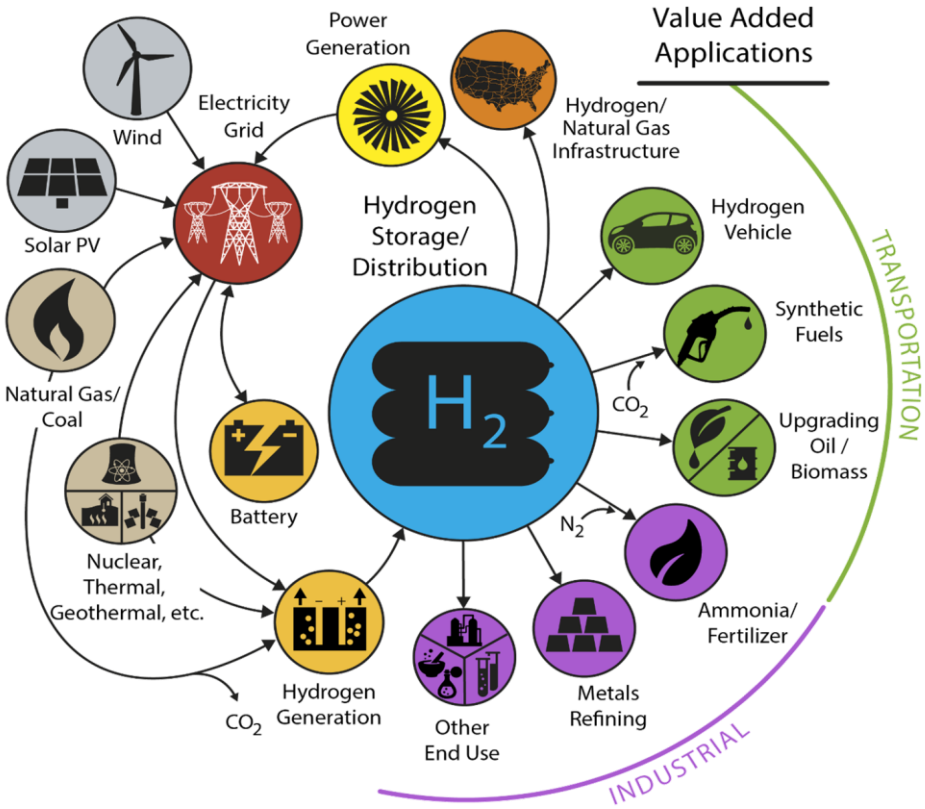
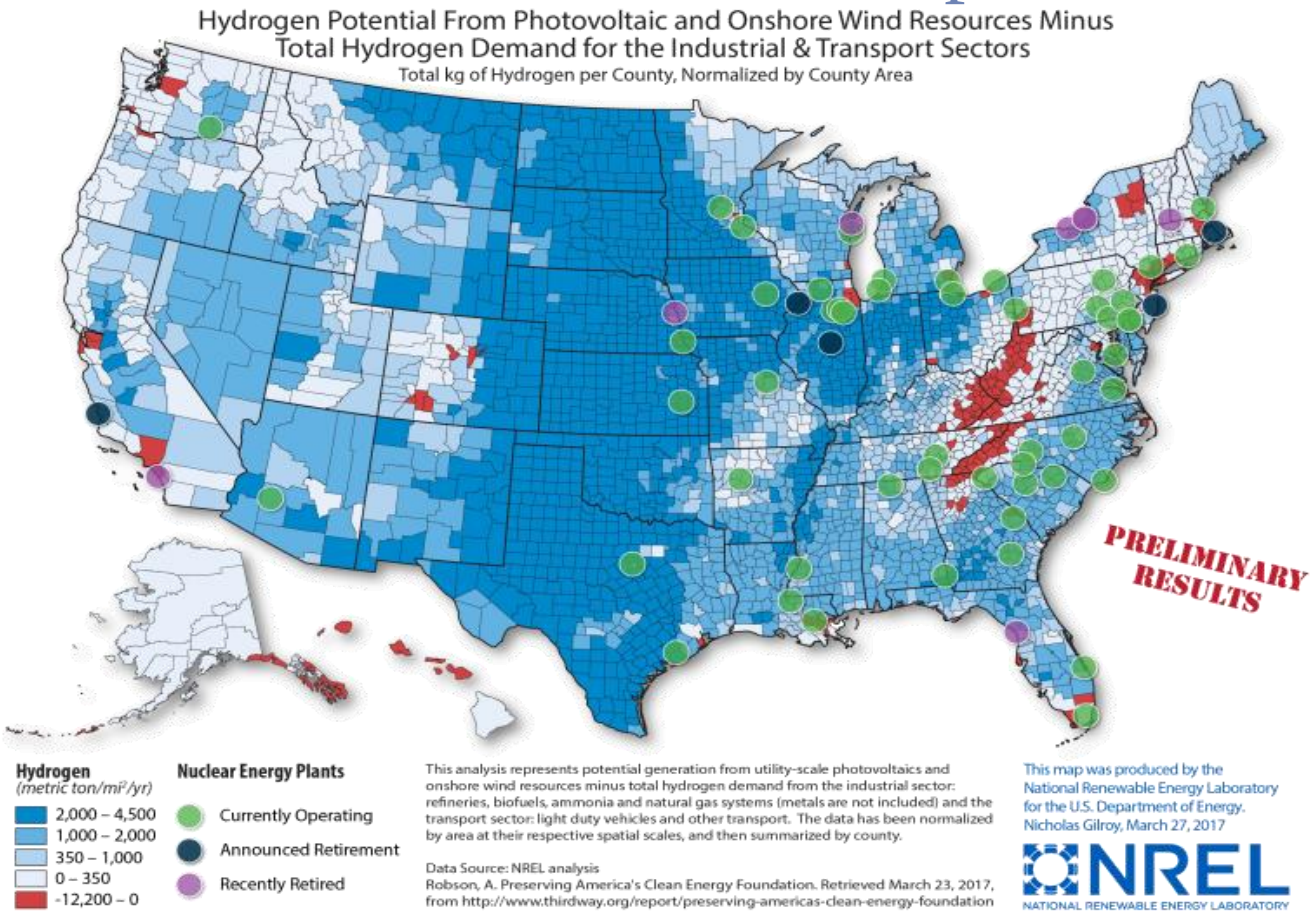
Vision and Strategy

- **Early-stage R&D** to meet cost and technical targets, including safety R&D
- **H2@Scale** including H_2 production, delivery and storage innovation
- **Leverage private sector** and partnerships to enable wide-scale commercialization and deployment – cluster strategy



H2@Scale Supply vs. Demand Analysis - Example



Lab PIs: Mark Ruth, Bryan Pivovar, Richard Boardman, et al

Labs assess resource availability. Most regions have sufficient resources.

Red: Only regions where projected industrial & transportation demand exceeds supply.

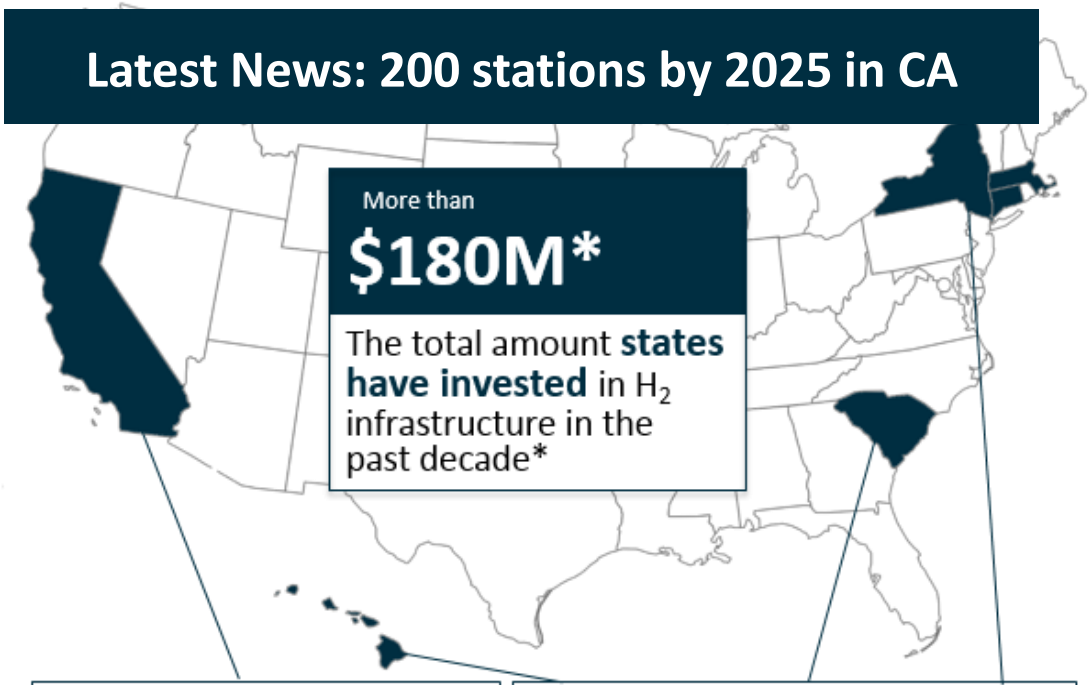
Market Update

U.S. Snapshot

- **>235MW** Backup Power
- **>16,000** Forklifts
- **>25** Fuel Cell Buses
- **>30** H_2 retail stations
- Nearly **4,500** fuel cell cars

Cumulative State Funding

Latest News: 200 stations by 2025 in CA

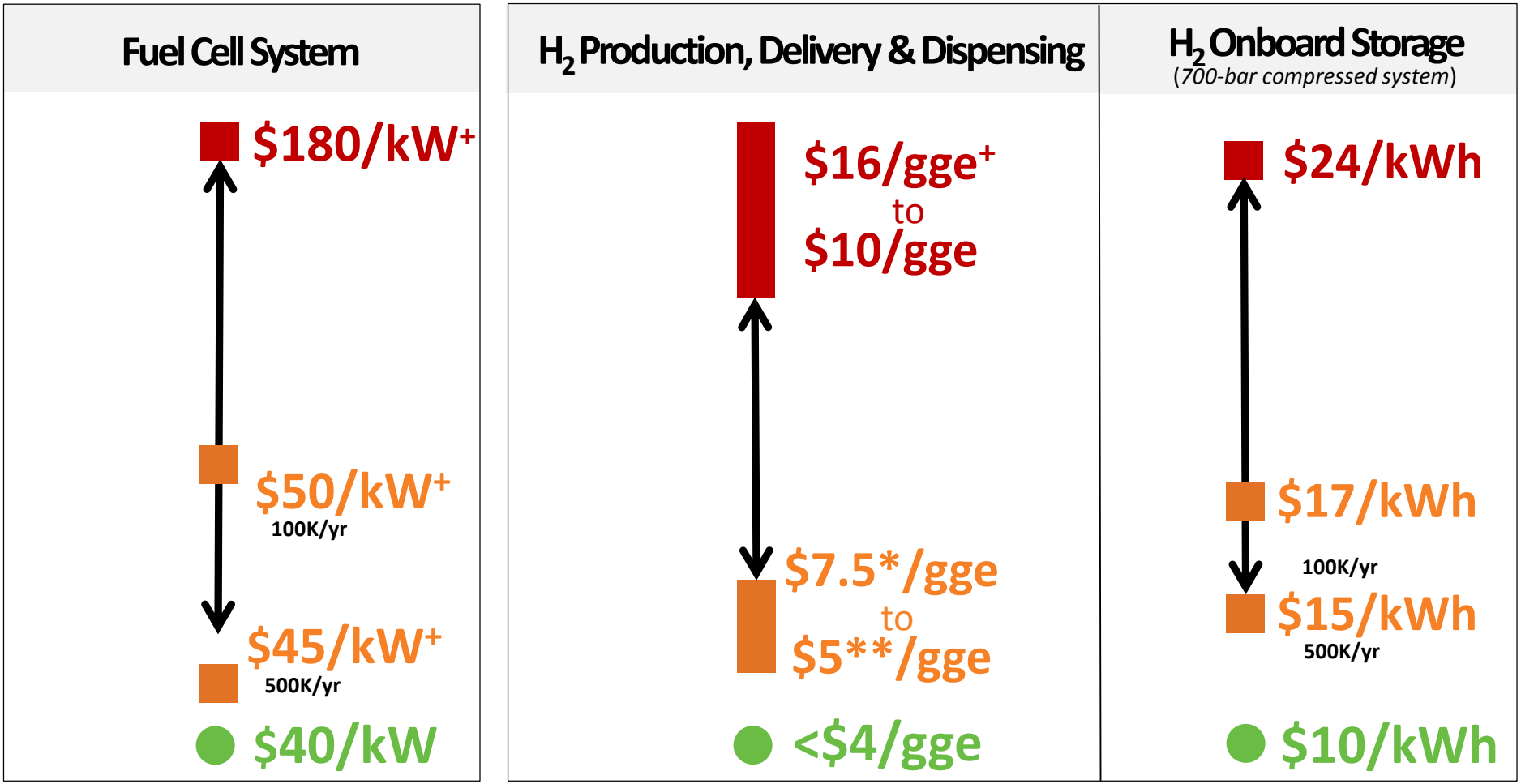


CA
- 200 stations planned
- Over 30 public stations open
- $150M invested
- $235M announced in 2018

HI, SC, NY, CT, MA and others
- Over $27M invested
- 12-25 stations planned in the NE

*Excludes recent announcement from CA to invest $235M in electric vehicles

U.S. DOE Cost Status and Targets for R&D

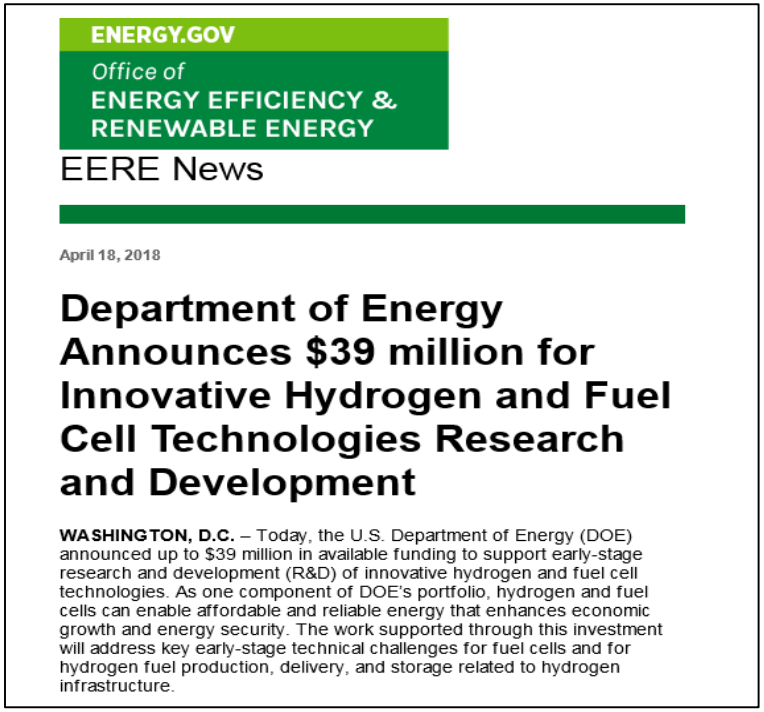


*Based on Electrolysis **Based on NG SMR + Preliminary, updates underway
Onboard storage cost status from DOE Program Record 15013

Note: Graphs not drawn to scale and are for illustration purposes only.
Data through 2017

Early-Stage R&D Updates

- **Pursue early R&D innovation**
  - Fuel cells, hydrogen fuel, and innovative concepts to enable infrastructure (FOA announced)
- **Strengthen supply chain - infrastructure component R&D**
- **Leverage collaborations to maximize impact**



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ENERGY EFFICIENCY & RENEWABLE ENERGY
EERE News

April 18, 2018

Department of Energy Announces $39 million for Innovative Hydrogen and Fuel Cell Technologies Research and Development

WASHINGTON, D.C. – Today, the U.S. Department of Energy (DOE) announced up to $39 million in available funding to support early-stage research and development (R&D) of innovative hydrogen and fuel cell technologies. As one component of DOE's portfolio, hydrogen and fuel cells can enable affordable and reliable energy that enhances economic growth and energy security. The work supported through this investment will address key early-stage technical challenges for fuel cells and for hydrogen fuel production, delivery, and storage related to hydrogen infrastructure.

DOE Announcement on 4/18 to Support Early Stage R&D of Innovative Hydrogen and Fuel Cell Technologies

"Agencies should invest in early-stage, innovative technologies that show promise in harnessing American energy resources safely and efficiently."

-Aug. 17, 2017 OMB/OSTP Memo

Resources

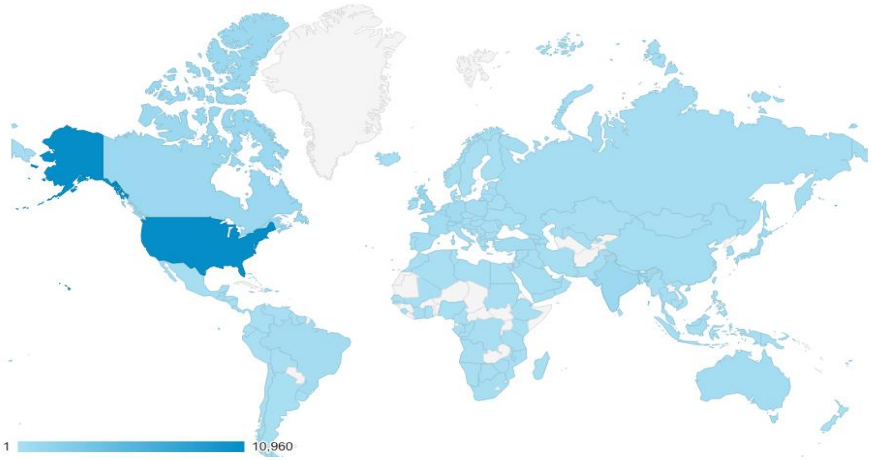
Examples

- H2Tools.org, including:

National Hydrogen and Fuel Cells Emergency Response Training Resource

- Data sharing (tech validation)
- Increase your H2IQ
- Incorporation into Federal Energy Management training modules

H_2Tools.org: Nearly 300K site visits tracked!



Collaboration Opportunities

First-time ever

U.S. Govt. agencies working together at 2018 AMR

June 12-15. Washington, D.C.

Two requests for information:

- How to **reduce barriers to H_2 infrastructure**
- Capturing **remote energy resources with H_2**

National **Hydrogen** & **Fuel Cell** Day | 10·08

Participate in social media using **#HydrogenNow #FuelCellsNow**

Thank You

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