



U.S. Country Update

25th IPHE Steering Committee (SC) Meeting



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U.S. Department of Energy



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USA



Funding updates for your research, development and deployment programs

Country Update: United States

Key Activity	FY 15	FY 16	FY17
	(\$ in thousands)		
	Approp.	Approp.	Request
Fuel Cell R&D	33,000	35,000	35,000
Hydrogen Fuel R&D ¹	35,200	41,050	44,500
Manufacturing R&D	3,000	3,000	3,000
Systems Analysis	3,000	3,000	3,000
Technology Validation	11,000	7,000	7,000
Safety, Codes and Standards	7,000	7,000	10,000
Market Transformation	3,000	3,000	3,000
Technology Acceleration	0	0	13,000 ²
NREL Site-wide Facilities Support	1,800	1,900	N/A
Total	97,000	100,950	105,500

Office	FY 2015
EERE	\$97.0M
Basic Science	\$18.5M
Fossil Energy, SOFC	\$30.0M

FY 2015 DOE Total: ~\$150M

Number of Recipients funded from 2008-2015	
Industry	>110
Universities	>100
Laboratories	12

¹Hydrogen Fuel R&D includes Hydrogen Production & Delivery R&D and Hydrogen Storage R&D

²Combines Manufacturing R&D, Technology Validation, Market Transformation.

Sustained, stable funding requests and appropriations



Country Update: United States

Opportunities for H₂ and fuel cells aligned with Mission Innovation activities

Activities

Consortia Core

Fuel Cells: FC-PAD (Fuel Cell Performance and Durability)

- Improve performance and durability

Storage: HyMARC (Hydrogen Storage Materials Advanced Research Consortium)

- Address gaps blocking the advancement of solid-state storage materials

Fuel Cells: ElectroCat (Electrocatalysis Consortium)

- Accelerate non-PGM catalyst development

Renewable H₂ Production: (Consortium to be announced)

- Accelerate research, development and deployment of advanced water splitting technologies

Projects added through Solicitations*

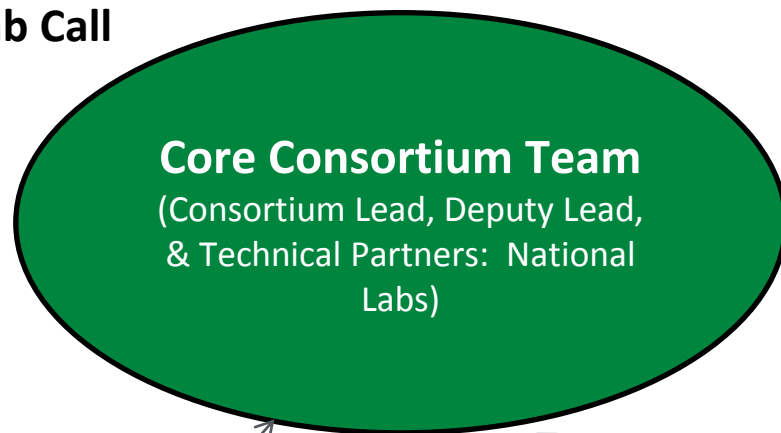
- Companies, universities, labs
- 2-4 yrs/project

* Subject to appropriations

Strategy and Structure

Multi-Lab team with Lab Call to competitively select core team

Lab Call



FOA





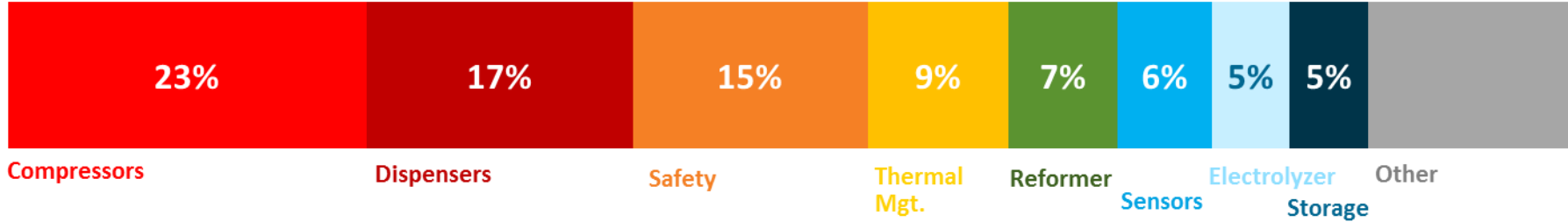
Ideas for areas of collaboration among IPHE members

Country Update: United States

IPHE International Safety and Reliability Data Sharing Initiative

- IPHE initiative with Japan and the United States currently participating
- Purpose: gather information **on safety and incident data and station maintenance and reliability.**
- Data is collected, anonymized, and published by NREL’s National Fuel Cell Technology Evaluation Center

Example: Sources of H₂ Infrastructure Maintenance (out of 5,531 events)



Education and Outreach

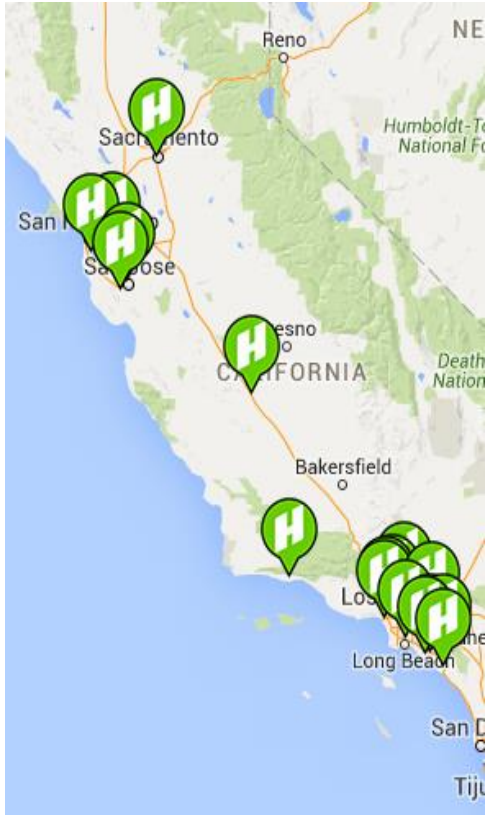
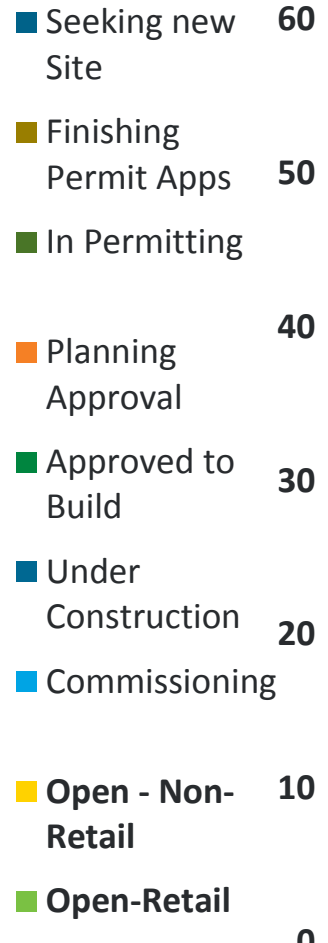
- **Doohwan Lee**, professor from Korea, has taken a sabbatical to join Fuel Cell Technologies Office
- FCTO hosts a monthly webinar series – all are welcome to attend: <http://energy.gov/eere/fuelcells/webinars>
- FCTO monthly newsletter – sign up to receive: <http://energy.gov/eere/fuelcells/fuel-cell-technologies-office-newsletter>
- 2016 Annual Merit Review and Peer Evaluation Meeting (AMR) for the Hydrogen and Fuel Cells Program, June 6–10, 2016, in Washington, D.C.: <http://www.annualmeritreview.energy.gov/> 4



Key items from the written Country Update

Country Update: United States

51 Planned and/or Open H₂ Stations in California



Green icons indicate Open Retail Stations

12 Planned Retail H₂ Station in the North East



Units Purchased or On Order*:

- >7,800 Backup Power
- >11,600 Fork Lifts

*numbers undergoing verification

New projects – parcel 5 delivery and airport tractors

As of May 5, 2016 (Data from CARB). * Stations in need of extension or upgrade

Currently Torrance (H70 only), Santa Monica, San Juan Capistrano, and OCSD are offline (01/15/16 CaFCP SOSS)