



International Partnership  
for Hydrogen and Fuel Cells  
in the Economy

# United States Update

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33<sup>rd</sup> IPHE Steering Committee Meeting

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# Announcements and New Initiatives

## United States



### U.S. DOE Funding Announcements

- Focus on heavy duty applications (e.g. trucks, marine) and industrial use of hydrogen (e.g. steel) to enable H2@Scale
- \$64M to demonstrate new and emerging markets for hydrogen including R&D for heavy duty and \$21M for nuclear to hydrogen demonstration

### Demonstrations

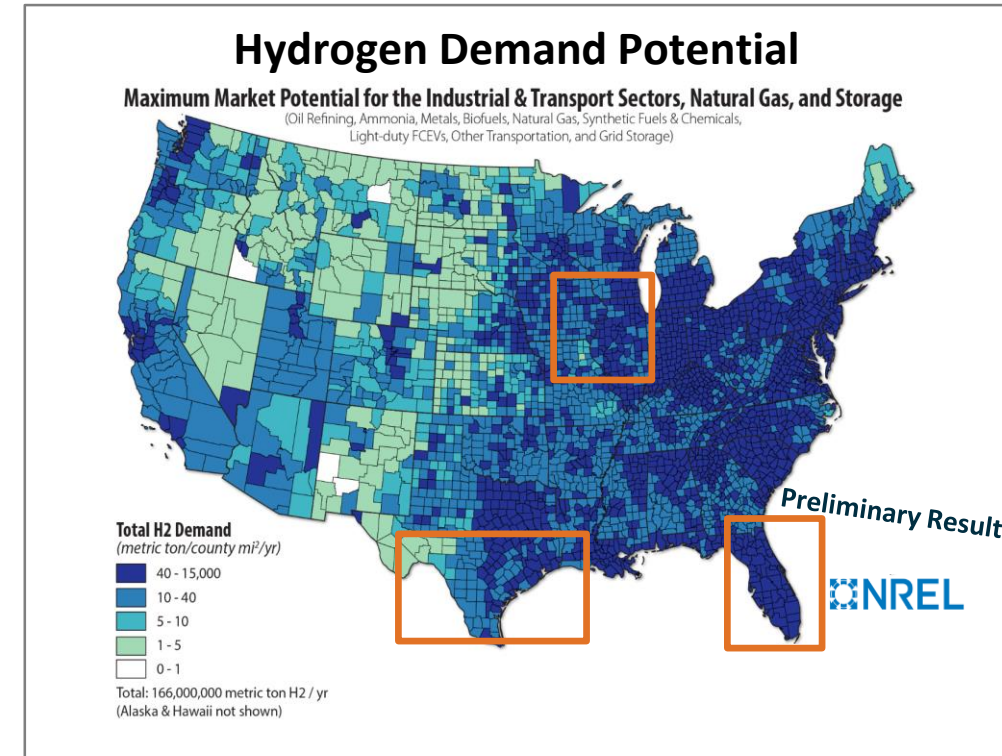
- First H2@Scale demo projects beyond CA: TX, FL, Midwest, including nuclear to H2
- H2 Resource/Demand Assessment: 2-4X potential economic demand
- 1<sup>st</sup> train project announced in the US (San Bernardino) for 2023

### Industry News

- Cummins acquired Hydrogenics
- Nikola joint venture
- Plug Power acquired United Hydrogen Group

4\* new H2@scale demonstration projects in Texas, Florida and Midwest.

\*Includes 1 project by Office of Nuclear Energy





# Profile June 2020


## United States





### Status of Deployments

- 

**>500MW**  
 Backup Power
- 

**>33,000**  
 Forklifts
- 

**>60**  
 Fuel Cell Buses
- 

**>40**  
 H<sub>2</sub> Retail Stations
- 

**>8,500**  
 Fuel Cell Cars

### Funding (in \$K)

Area	FY 2019	FY 2020
Fuel Cell R&D	30,000	26,000
Hydrogen Fuel R&D	39,000	45,000
Hydrogen Infrastructure R&D	21,000	25,000
Technology Acceleration	21,000	41,000
Safety, Codes, and Standards	7,000	10,000
Systems Analysis	2,000	3,000
<b>Total</b>	<b>\$120,000</b>	<b>\$150,000</b>

Additional FY20 appropriations for Fossil Energy (SOFC) \$30M, and Nuclear Energy (\$11M) for nuclear to H<sub>2</sub> demonstration project with HFTO (\$10M)

### Focus Areas (“Beyond Light Duty Vehicles”)



### Deployment Goals\*

#### California

200 Stations Planned  
 1,000 by 2030 – CaFCP goal

#### Northeast

12 – 20 Stations Planned

\*Driven by industry at the state level government (no federal goals)



# Examples of Lessons Learned and Impact

## *United States*



Program initiative, policy, regulation or mandate	Lessons Learned/Outcomes
<p><b>State funded hydrogen station rollout (California) provided funding for hydrogen fueling stations.</b></p>	<ul style="list-style-type: none"> <li>Challenges included early solicitations focused on Capex for station installation. Lessons learned resulted in covering Opex for stations.</li> <li>A major disruption in hydrogen availability due to an incident resulted in future solicitations requiring redundancy.</li> </ul>
<p><b>State example (California) requiring 33% renewables for hydrogen.</b></p>	<ul style="list-style-type: none"> <li>Incentivized use of renewables for hydrogen production rather than most readily available hydrogen (delivered from natural gas).</li> </ul>



# Status of Applications and Goals

## United States



Application	Status (As of June 2020)	Goal (For 2030)
<b>1) H<sub>2</sub> Applications</b>		
a. Energy Storage (e.g. MW, GW of capacity)	Emerging	N/A
b. Electrolyzers	10-20 MW (industry estimates)	N/A
c. Other (e.g., Steel, Marine, Fertilizer, etc.)	N/A	N/A
<b>2) Transportation</b>		
a. Light Duty Vehicles	>8,500	1,000,000 (California goal)
b. Medium and Heavy Duty Vehicles	Several	N/A
c. Buses	>60 buses	N/A
d. Trains	1 announced for 2023	N/A
e. Forklifts	>33,000 forklifts	N/A
<b>3) Stationary</b>		
a. Residential	N/A	N/A
b. Commercial	>500 MW	N/A
c. Back Up Power	>8,000 units	N/A
<b>4) Other (H<sub>2</sub> Stations)</b>	>40 (retail stations)	1,000 (California goal)



# Thank You



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