



U.S. DEPARTMENT OF
ENERGY

U.S. National Clean Hydrogen Strategy Remarks

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and Director, Hydrogen Interagency Task Force
U.S. Department of Energy

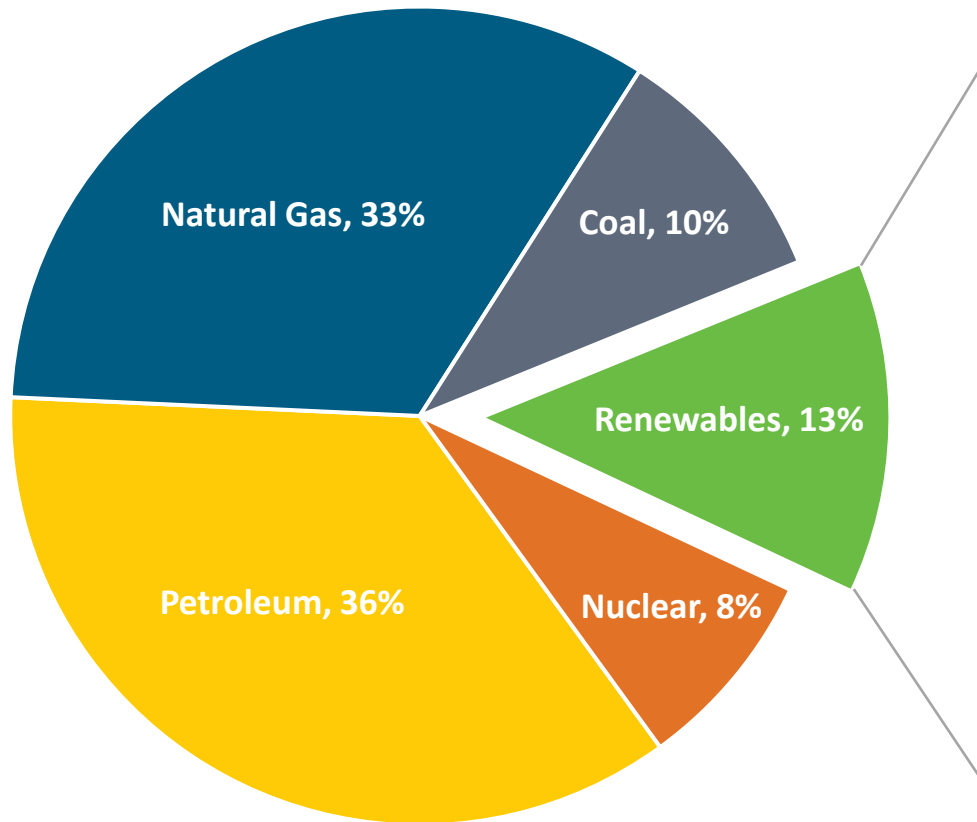
Spring 2024



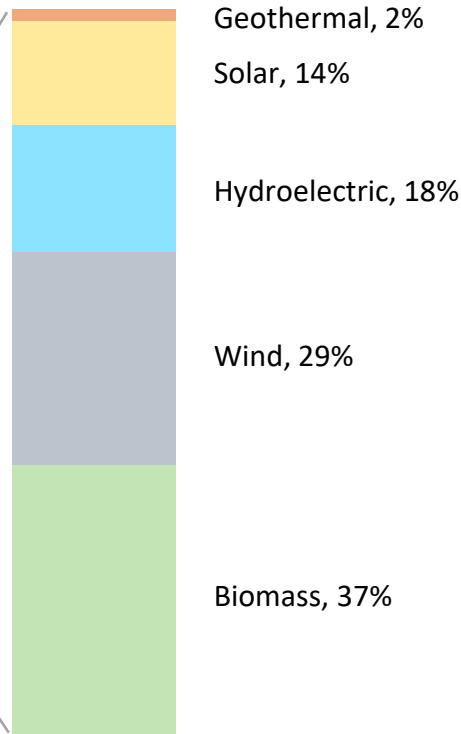
U.S. Energy Landscape and Key Goals

U.S. primary energy consumption by energy source, 2022

Total = 100.4 quadrillion
British thermal units (Btu)



Total = 13.1 quadrillion Btu



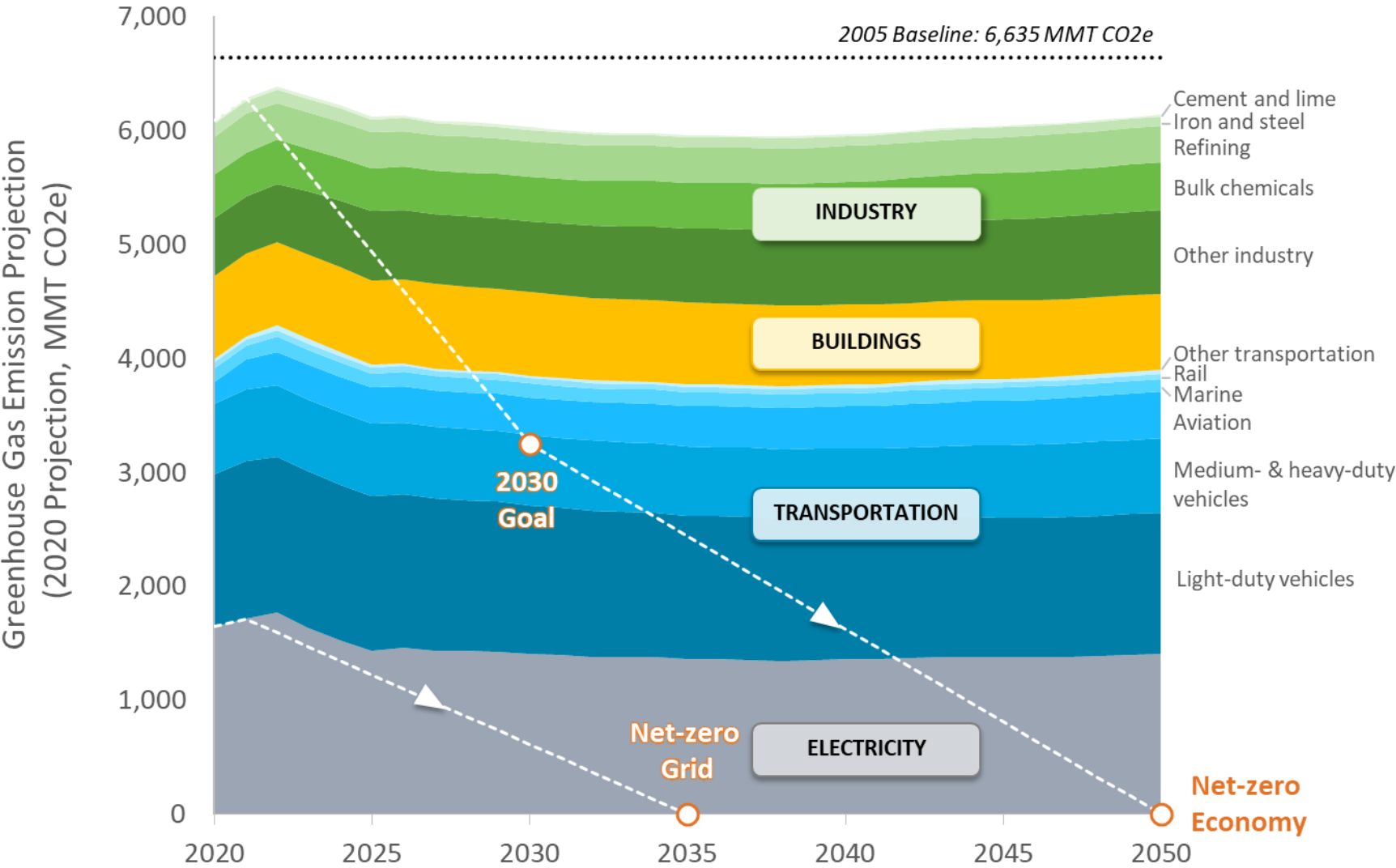
Note: Sum of components may not equal 100% because of independent rounding
Source: Data collected from U.S. Energy Information Administration, May 2023, *Monthly Energy Review*, preliminary data

Administration Goals include:

- Net-zero emissions economy by 2050 and 50–52% reduction by 2030
- 100% carbon-pollution-free electric sector by 2035

Priorities: Ensure benefits to all Americans, focus on jobs, Justice40: 40% of benefits in disadvantaged communities

Carbon Dioxide Emissions by Sector



Source: National Clean Hydrogen Strategy and Roadmap based on Annual Energy Outlook 2021

Legislation Highlights: 2021 – 2022

Bipartisan Infrastructure Law

- **Includes \$9.5B for clean hydrogen:**
 - \$1B for electrolysis
 - \$0.5B for manufacturing and recycling
 - \$8B for at least four regional clean hydrogen hubs
- **Requires developing a National Clean Hydrogen Strategy and Roadmap**



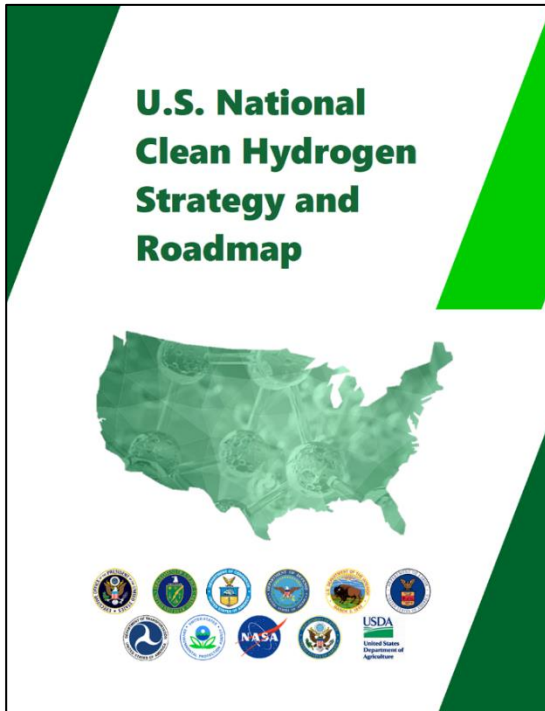
President Biden Signs the Bipartisan Infrastructure Bill into law on November 15, 2021. Photo Credit: Kenny Holston/Getty Images

Inflation Reduction Act

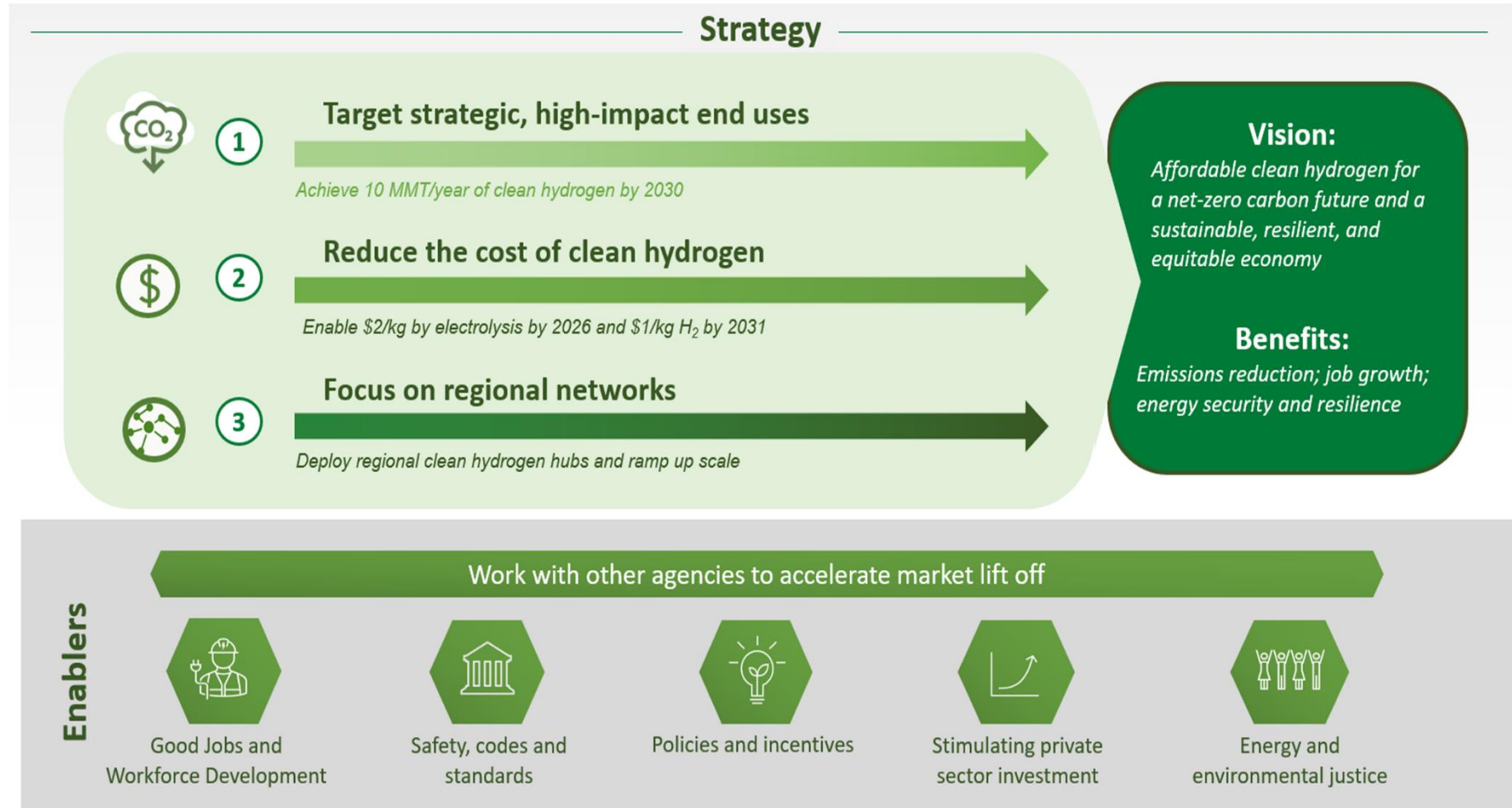
- **Includes significant tax credits** (e.g., up to \$3/kg for production of clean hydrogen)

Comment period closed for 45V Feb 26; Public hearing March 25

U.S. National Clean Hydrogen Strategy and Roadmap

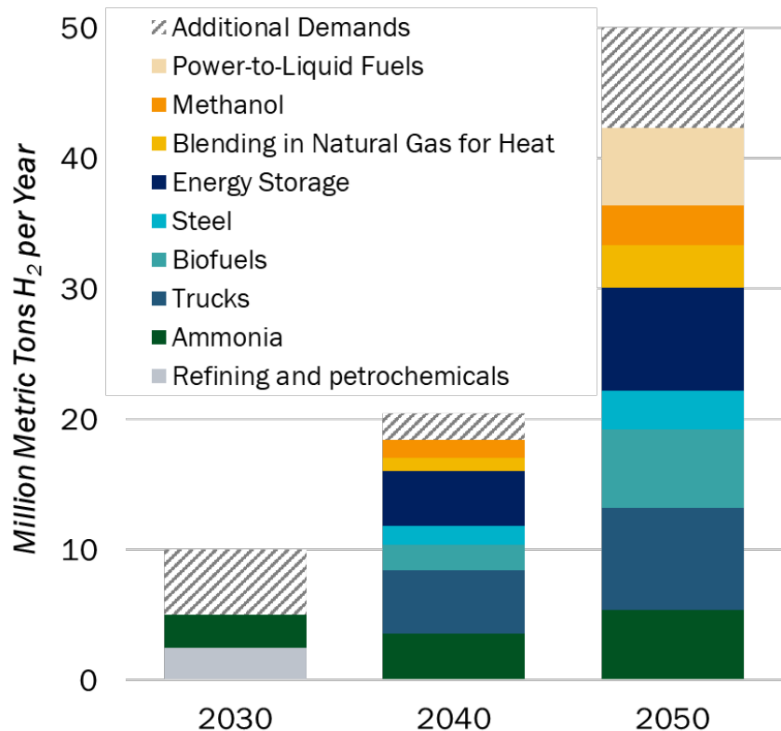


www.hydrogen.gov
Released June 5, 2023



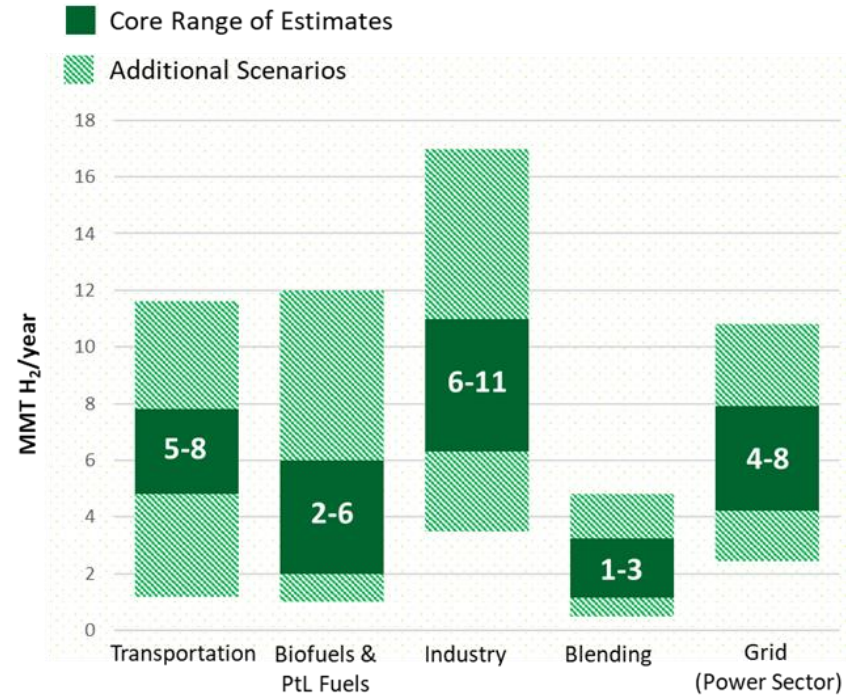
Strategy 1: Target Strategic, High-Impact End Uses

Opportunities for Clean Hydrogen Across Applications



- ### Clean Hydrogen Use Scenarios
- Catalyze clean H₂ use in existing industries (ammonia, refineries), initiate new use (e.g., sustainable aviation fuels (SAFs), steel, potential exports)
 - Scale up for heavy-duty transport, industry, and energy storage
 - Market expansion across sectors for strategic, high-impact uses

Range of Potential Demand for Clean Hydrogen by 2050



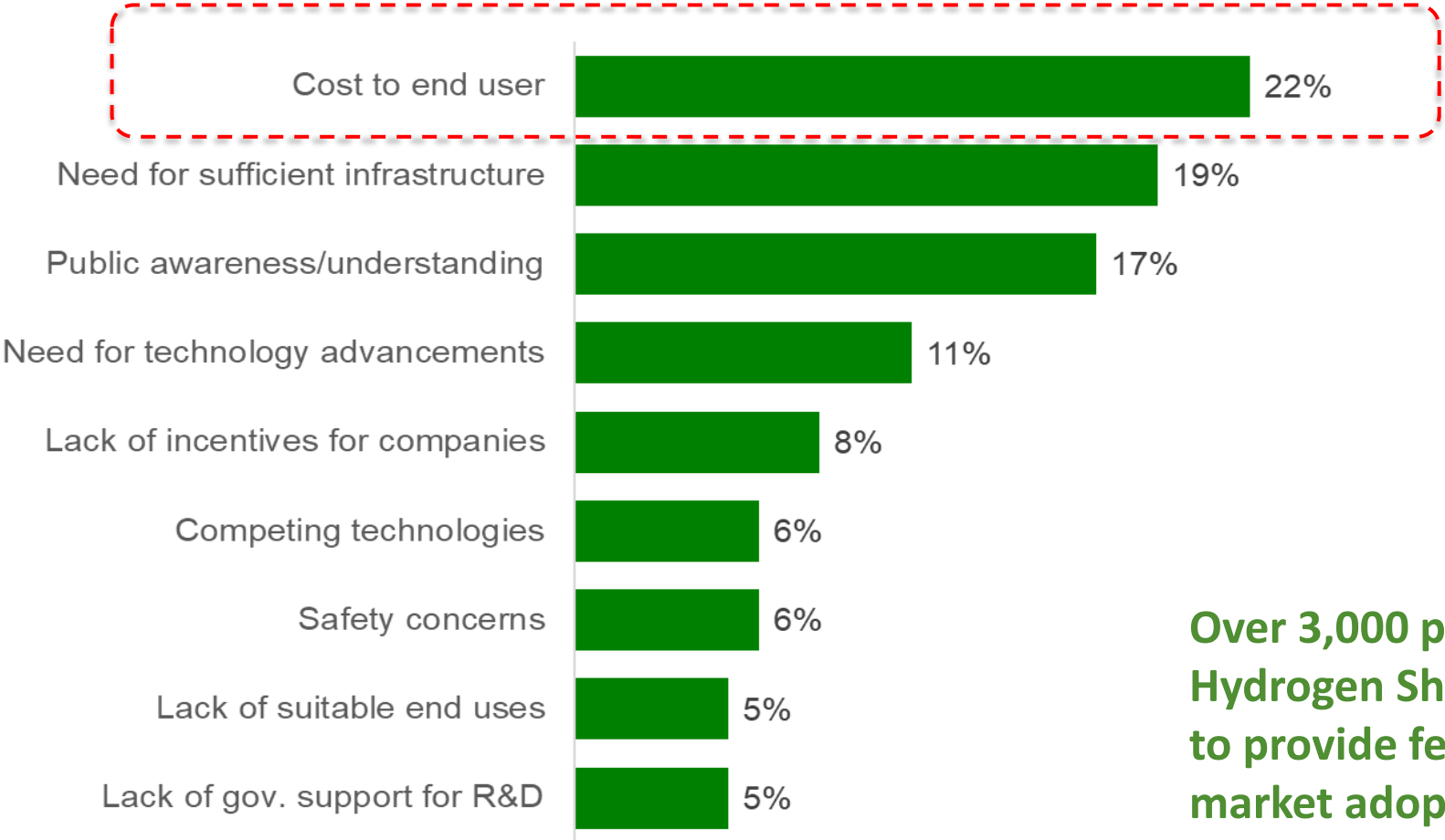
- Core range: ~ 18–36 MMT H₂
- Higher range: ~ 36–56 MMT H₂

U.S. Opportunity: 10MMT/yr by 2030, 20 MMT/yr by 2040, 50 MMT/yr by 2050. ~10% Emissions Reduction. ~100K Jobs by 2030

Refs: 1. NREL MDHD analysis using TEMPO model; 2. Analysis of biofuel pathways from NREL; 3. Synfuels analysis based off H2@Scale ; 4. Steel and ammonia demand estimates based off DOE Industrial Decarbonization Roadmap and H2@Scale. Methanol demands based off IRENA and IEA estimates; 5. Preliminary Analysis, NREL 100% Clean Grid Study; 6. DOE Solar Futures Study; 7. Princeton Net Zero America Study

Strategy 2: Focus on Cost-Reduction

Stakeholder Reported Barriers to Hydrogen Market Adoption



Over 3,000 participants at DOE Hydrogen Shot Summit were requested to provide feedback on key barriers to market adoption of hydrogen

Source: Hydrogen Shot Summit, Sept 2021

<https://www.energy.gov/eere/fuelcells/hydrogen-shot-summit>

Hydrogen Energy Earthshot

“Hydrogen Shot”

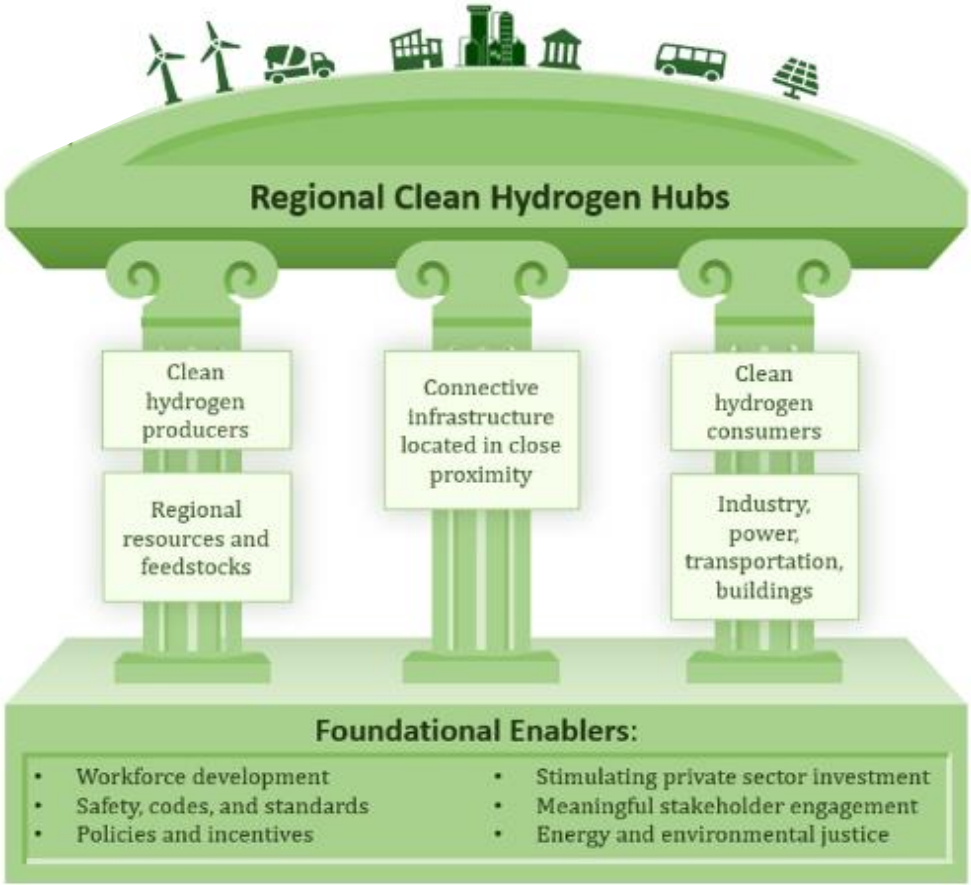
“1 1 1”

\$1 for 1 kg clean hydrogen in 1 decade

Strategy also includes delivery and storage infrastructure cost reduction

Strategy 3: Focus on Regional Networks and Ramp up Scale

Build Regional Networks through “Clean Hydrogen Hubs”



President Biden announces \$7B for 7 H2 Hubs, Oct '23



Demand side strategy for Hubs announced

Whole-of-Government Approach

HIT

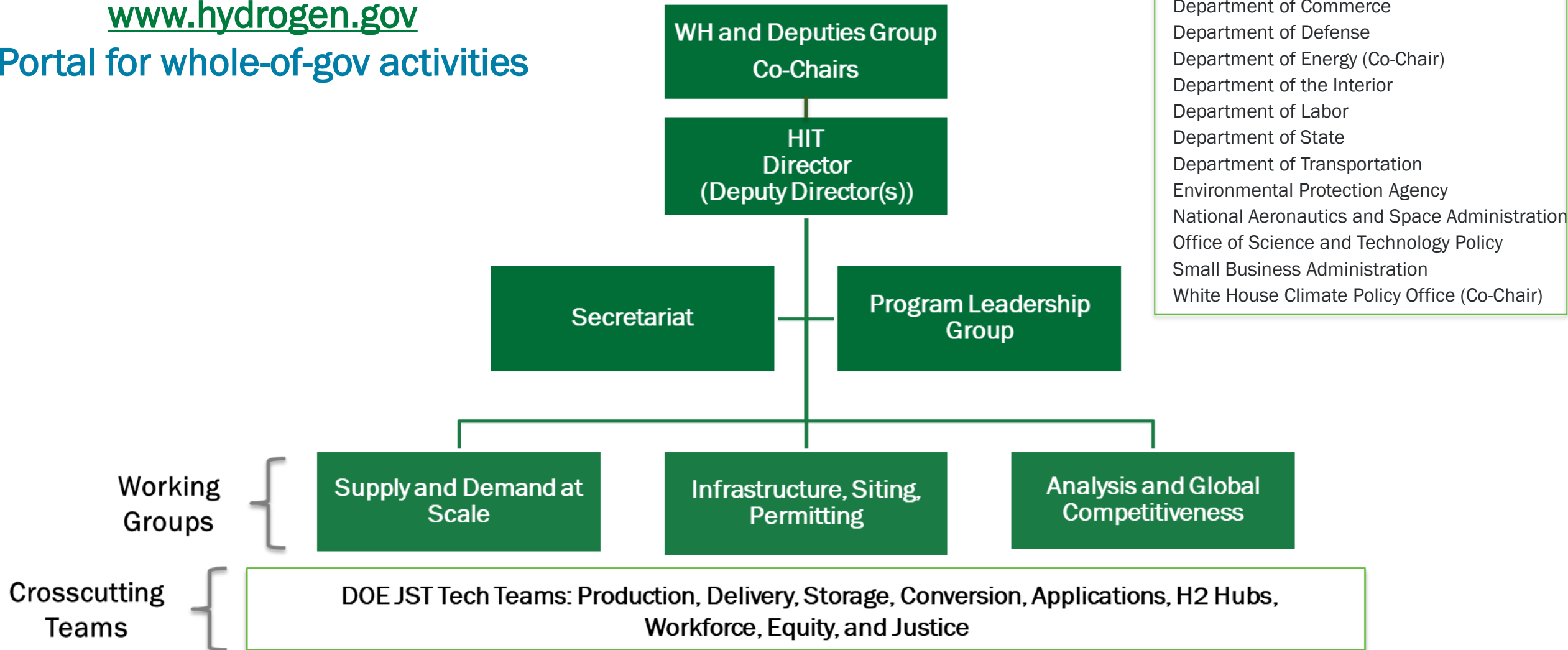
Hydrogen Interagency Task Force

H₂

Hydrogen Interagency Task Force (HIT) across Agencies

www.hydrogen.gov

Portal for whole-of-gov activities



JST: Joint Strategy Team. Equity, Energy and Environmental Justice is a cross cutting priority across WGs.



Global Coordination

Energy and Environmental Justice

***Diversity, Equity, Inclusion, and
Accessibility***

Examples of International Collaboration

Collaborating through multiple global and bilateral partnerships—key priority is creating coordinated framework to leverage activities, identify gaps, and avoid duplication to accelerate progress



H₂ Production Analysis (H2PA)
To facilitate international trade
Common analytical framework for
GHG emissions footprint

**Regulations, Codes, Standards,
Safety and Education &
Outreach Working Groups**

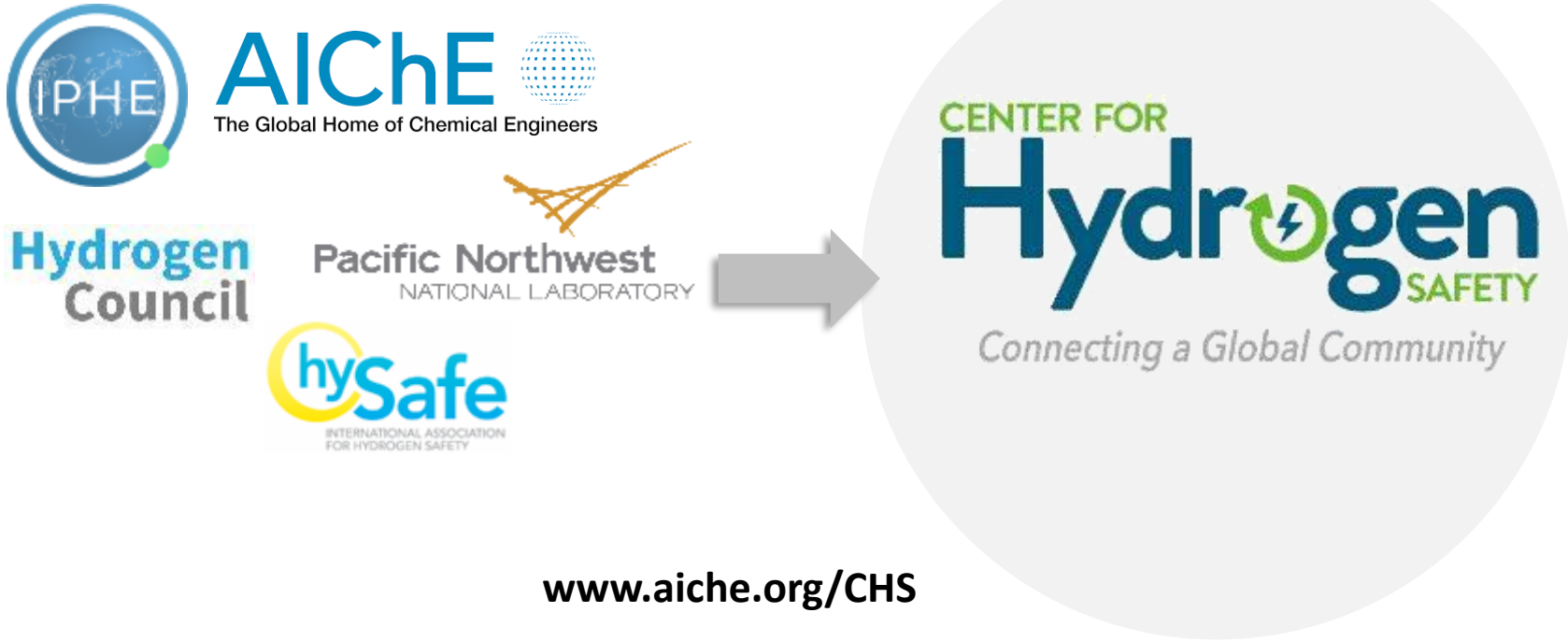
www.iphe.net

Launched H2-DEIA at COP
<https://h2-deia.org/>

Breakthrough Agenda in collaboration with other partnerships is mapping activities across global H₂ initiatives to identify gaps, focus areas, and prioritized workstreams

LEADERSHIP CONTRIBUTORS	Hydrogen Fuel Cells for sustainability in the industrial sector	Hydrogen Fuel Cells for sustainability in the industrial sector	Hydrogen Fuel Cells for sustainability in the industrial sector	Hydrogen Fuel Cells for sustainability in the industrial sector	Hydrogen Fuel Cells for sustainability in the industrial sector	Hydrogen Fuel Cells for sustainability in the industrial sector	Hydrogen Fuel Cells for sustainability in the industrial sector	Hydrogen Fuel Cells for sustainability in the industrial sector
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Call to Action: Join the Center for Hydrogen Safety!



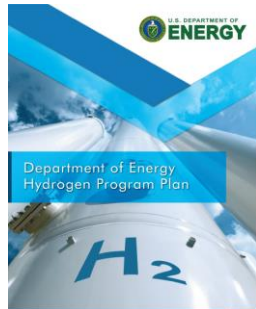
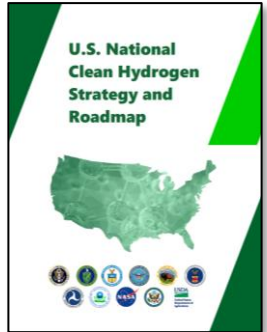
New Hydrogen Safety Credential!
Composed of 7 fundamental hydrogen safety e-courses, including:

- Properties & Hazards
- Safety Planning
- System Operation
- Inspection & Maintenance

Over 100 members from industry, government, and academia—and growing!

Resources and Opportunities for Engagement

Key Publications



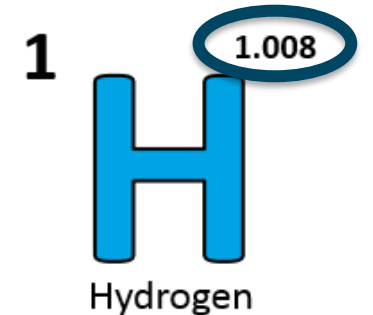
www.hydrogen.energy.gov

Save the date!

**2024 DOE
Annual Merit
Review May 6-9,
2024**

**Hydrogen and Fuel Cells Day
October 8**

- Held on hydrogen's
very own atomic
weight-day



**INCREASE YOUR
H₂IQ**
hydrogen.energy.gov

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H2IQ Hour Webinars**

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Lessons Learned**

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**CENTER FOR
Hydrogen
SAFETY**
Connecting a Global Community
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Sign up to receive hydrogen and fuel cell updates

www.energy.gov/eere/fuelcells/fuel-cell-technologies-office-newsletter

Learn more at: energy.gov/eere/fuelcells AND www.hydrogen.energy.gov

Thank you

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