

U.S. National Clean Hydrogen Strategy Remarks

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U.S. Energy Landscape and Key Goals



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

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

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

Inflation Reduction Act



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

• 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



Released June 5, 2023

Workforce Development standards

sector investment

Energy and

environmental justice

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, highimpact uses

Range of Potential Demand for Clean Hydrogen by 2050



• Core range: ~ 18–36 MMT H₂

• Higher range: ~ 36–56 MMT H₂

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

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

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

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

Source: Hydrogen Shot Summit, Sept 2021



Hydrogen

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

42

Hydrogen Interagency Task Force (HIT) across Agencies



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



CEM Global Ports Coalition with EC Numerous Bilaterals on Hydrogen Hydrogen Council, IRENA, and more



The International Partnership for Hydrogen and Fuel Cells in the Economy Enabling the global adoption of hydrogen and fuel cells in the economy

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/

BREAKTHROUGHS

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

Landscape Coordination	Hydrogen Knowl likes of the partnerskip of the indictions indice							
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Call to Action: Join the Center for Hydrogen Safety!



www.aiche.org/CHS

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

New Hydrogen Safety Composed of 7 fundamental hydrogen safety e-courses,

including: Properties & Hazards

- Safety Planning
- System Operation
- Inspection & Maintenance

Resources and Opportunities for Engagement



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

Thank you

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www.energy.gov/fuelcells www.hydrogen.energy.gov