



**OCED**  
Office of Clean Energy Demonstrations

THE OFFICE OF  
**CLEAN ENERGY DEMONSTRATIONS**



**Regional Clean Hydrogen Hubs  
National Briefing**

October 16, 2023

Office of Clean Energy Demonstrations  
U.S. Department of Energy

# Welcome



# Agenda

- Welcome and Opening Remarks
- Overview
- Selected Regional Clean H2Hubs Projects Overview
- Next Steps & Resources



# Opening Remarks

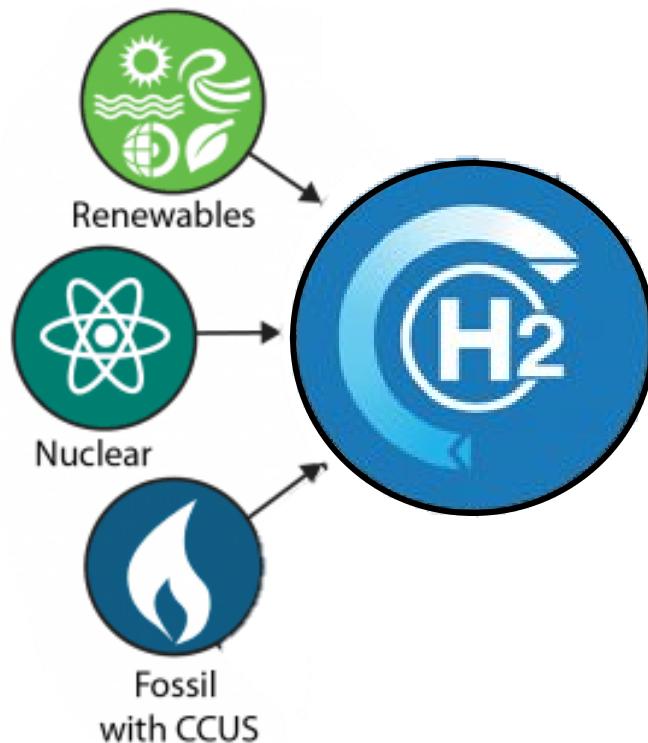


# Overview



# What is Hydrogen?

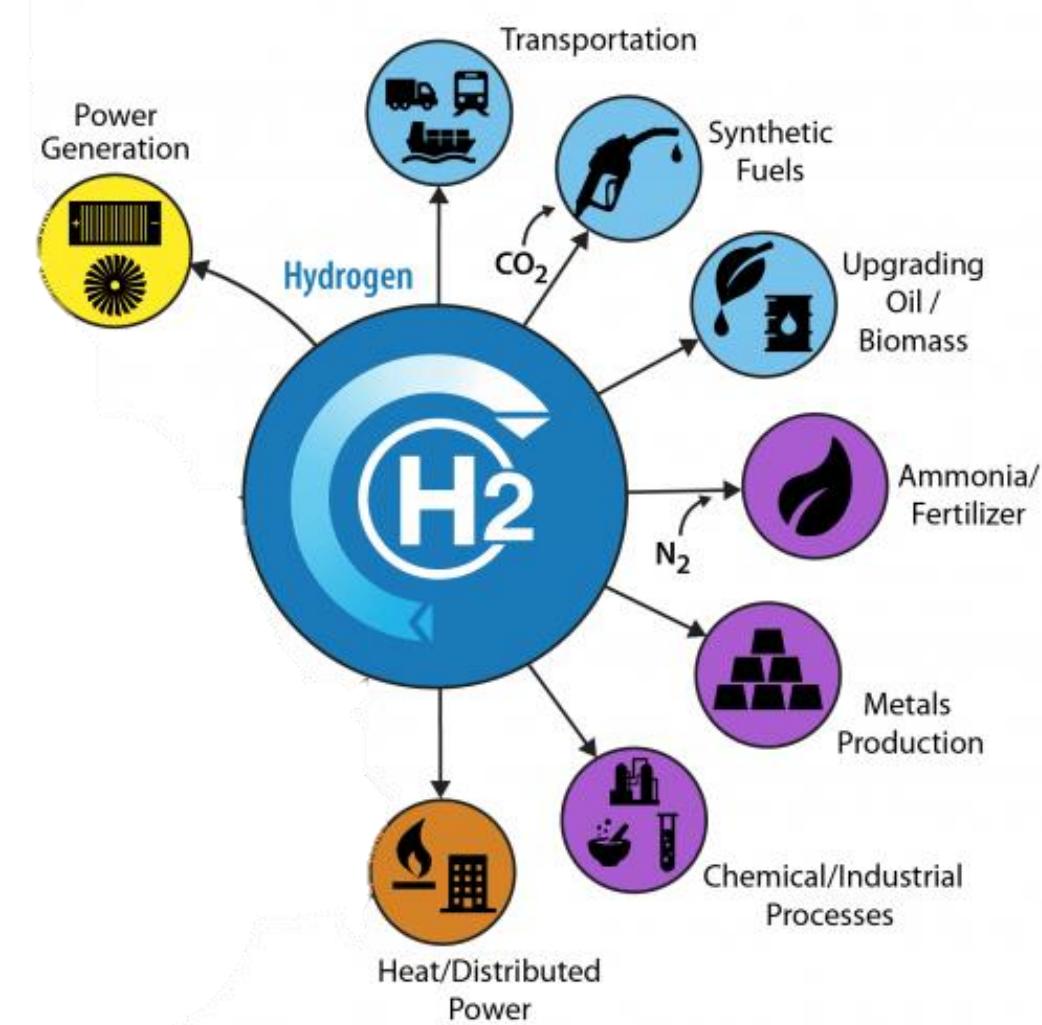
- **Hydrogen (H<sub>2</sub>)** is the simplest and most abundant element known.
  - You might recognize it from the chemical formula for water – H<sub>2</sub>O!



- **Hydrogen can be made using a variety of domestic energy resources.**
- Hydrogen can be produced through several processes, including:
  - Electrolysis; Direct Solar Water Splitting
  - Thermal Conversion Processes
  - Biological (e.g., algae)
- **Currently, the U.S. produces 10 million metric tons of hydrogen each year.**

# What Can Hydrogen Do?

- Hydrogen is **part of a suite** of solutions that can help our nation achieve its net-zero goals.
- Helps hard-to-decarbonize sectors such as **heavy-duty transportation, steel and chemicals** manufacturing, and production of **liquid fuels**.
- Supports **increased integration of renewable energy** into the grid and offers multiple revenue streams for clean power generation.



# Whole of Government Approach to Clean Hydrogen



**U.S. National Clean Hydrogen  
Strategy and Roadmap**



**Hydrogen Shot  
(\$1/kg by 2031)**



**Clean Hydrogen Standard**



**H2Hubs Demand-Side  
Support Initiative**



**IRA tax incentives**



**Clean Hydrogen Pathways to  
Commercial Lift-Off Report**



**Coordination with  
Canada and Mexico**  
on building out the clean  
hydrogen supply chain and  
economy across North America



**Additional DOE funding:  
Clean H2 Electrolysis  
Clean H2 Manufacturing  
and Recycling  
(additional \$1.5B)**

**AND...**



**OCED**  
Office of Clean Energy Demonstrations



## Regional Clean Hydrogen Hubs

**Build 6-10 regional clean H2Hubs across the country to create networks of clean hydrogen producers, consumers, and local connective infrastructure to accelerate use of clean hydrogen.**

### ***H2Hubs Demand-Side Support Initiative***

- Sept 2023: Announced \$1B RFP. Responses are due on October 26, 2023.
- Learn more about the initiative here: [https://www.youtube.com/watch?v=QgOL\\_Xg7K1Q](https://www.youtube.com/watch?v=QgOL_Xg7K1Q)

### ***H2Hubs Current Status***

- **October 2023: DOE announced 7 projects selected for award negotiations.**
- April 2023: Received full applications.

# What is a Regional Clean Hydrogen Hub?



# Prioritizing Community Benefits in OCED Projects

OCED **requires** applicants to include a Community Benefits Plan (CBP) to help ensure broadly shared prosperity in the clean energy transition.

By **prioritizing community benefits**; we can ensure the next chapter in America's energy story is marked by greater justice; equity; security; and resilience.

## Community & Labor Engagement



## Diversity; Equity; Inclusion; & Accessibility



## Investing in the American Workforce



## Justice40 Initiative



# Selected H2Hubs Project Overviews



# Selected Regional Clean Hydrogen Hubs



# Selected H2Hubs Overview

**Unprecedented  
Investment in America's  
Hydrogen Infrastructure**

**Federal investment of  
\$7 billion**

**To accelerate adoption of  
hydrogen technologies**

**Approximately 3  
Million Metric Tons of  
Hydrogen Production  
per Year**

**Providing tangible  
benefits for Americans**

**Dedicated Dollars for  
Community Benefits**

**Tens of Thousands of  
Jobs**

**Greenhouse Gas  
Reduction of 25 million  
Metric Tons Per Year**

# Appalachian Hydrogen Hub

Selectee: Appalachian Regional Clean Hydrogen Hub (ARCH2)



## Project Overview

Prime Applicant:  
**Battelle Memorial Institute**

Locations:  
**Ohio, Pennsylvania, and  
West Virginia**

Federal Cost Share:  
**Up to \$925 Million\***

\*Pending negotiations

## Production

- **Thermal conversion**
- **Electrolysis**

## Midstream

- **Hydrogen pipelines**
- **Hydrogen fueling stations**
- **Permanent CO<sub>2</sub> storage**

## End Uses

- **Fuel cell electric mining vehicles**
- **Heavy duty vehicles**
- **Heavy industry**

# Appalachian Hydrogen Hub

Selectee: Appalachian Regional Clean Hydrogen Hub (ARCH2)



## Community Benefits - Highlights



Creation of over 21,000 jobs, including more than 18,000 construction jobs and 3,000 permanent jobs.



Plan to make a Community Benefits Advisory Board to oversee implementation of the Community Benefits Plan (CBP).



Plan to make a Community Commitment Fund to ensure it reenergizes the Appalachian region economically, socially, and environmentally.

# California Hydrogen Hub

Selectee: Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES)



## Project Overview

Prime Applicant:  
**Alliance for Renewable  
Clean Hydrogen Energy  
Systems**

Location:  
**California**

Federal Cost Share:  
**Up to \$1.2 Billion\***

\*Pending negotiations

## Production

- **Thermal conversion**
- **Electrolysis**
- **Freight network between California & Pacific Northwest Hub**
- **Hydrogen fueling stations**

## Midstream

## End Uses

- **Backup power generation**
- **Heavy duty vehicles**
- **Port equipment**
- **Public transit**

# California Hydrogen Hub

Selectee: Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES)



## Community Benefits - Highlights



Creation of 220,000 jobs, including 130,000 construction jobs, and 90,000 permanent jobs.



Inclusion of independent monitoring and a CBP scorecard with monetary penalties for noncompliance.



Committed to requiring Project Labor Agreements (PLAs) for all projects connected to the Hub.

# Gulf Coast Hydrogen Hub

Selectee: HyVelocity H2Hub



## Project Overview

Prime Applicant:  
**HyVelocity, Inc.**

Location:  
**Texas**

Federal Cost Share:  
**Up to \$1.2 Billion\***

\*Pending negotiations

## Production

## Midstream

## End Uses

- Thermal conversion
- Electrolysis
- Hydrogen pipeline
- Salt cavern storage
- Hydrogen refueling stations
- Heavy duty vehicles
- Power generation
- Ammonia
- Refineries / petrochemicals
- Marine fuel

# Gulf Coast Hydrogen Hub

Selectee: HyVelocity H2Hub



## Community Benefits - Highlights



Creation of approximately 45,000 jobs, including 35,000 construction jobs, and 10,000 permanent jobs.



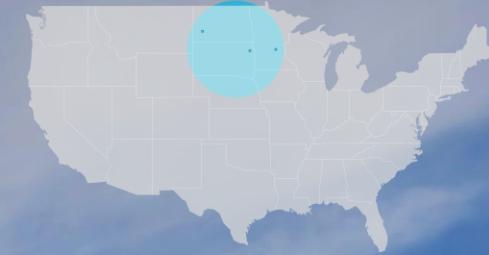
Plan to create a Community Advisory Board, which includes two councils that will leverage the capabilities of education and community partners, to support inclusive and equitable workforce development and community investment.



A key Justice40 benefit is the reduction of air pollution, including particulate matter.

# Heartland Hydrogen Hub

Selectee: Heartland Hub (HH2H)



## Project Overview

Prime Applicant:  
**Energy and Environmental  
Research Center (EERC)**

Locations:  
**Minnesota, North Dakota,  
and South Dakota**

Federal Cost Share:  
**Up to \$925 Million\***

\*Pending negotiations

## Production

- **Thermal conversion**
- **Electrolysis**

## Midstream

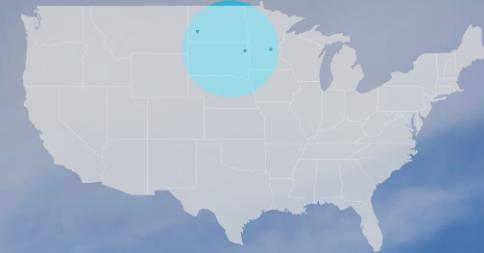
- **Open access storage and  
pipeline infrastructure**

## End Uses

- **Fertilizer**
- **Power generation**

# Heartland Hydrogen Hub

Selectee: Heartland Hub (HH2H)



## Community Benefits - Highlights



Creation of over 3,880 jobs, including more than 3,067 construction jobs, and 703 permanent jobs.



Creation of an education consortium to oversee career development, workforce training, apprenticeship programs, and K – 12 STEM education.



Goal to contract millions of dollars for businesses owned by women, minorities, disabled veterans, disadvantaged communities, or LGBTQ persons.

# Mid-Atlantic Hydrogen Hub

Selectee: Mid-Atlantic Clean Hydrogen Hub (MACH2)



## Project Overview

Prime Applicant:  
**Mid-Atlantic Clean Hydrogen Hub, Inc.**

Locations:  
**Delaware, New Jersey, Pennsylvania**

Federal Cost Share:  
**Up to \$750 Million\***

\*Pending negotiations

## Production

- Thermal conversion
- Electrolysis
- Expanded pipeline infrastructure
- Upgraded bus mechanic depots
- Hydrogen refueling stations

## Midstream

## End Uses

- Heavy duty vehicles
- Refuse and sweeper trucks
- Power generation
- Combined heat and power

# Mid-Atlantic Hydrogen Hub

Selectee: Mid-Atlantic Clean Hydrogen Hub (MACH2)



## Community Benefits - Highlights



Creation of 20,800 jobs, including 14,400 construction jobs, and 6,400 permanent jobs.



Plan to negotiate project labor agreements (PLAs) for all projects.



Anticipate providing close to \$14 million for regional Workforce Development Boards that will serve as partners for community college training and pre-apprenticeships.



Plan to provide additional \$10 million for technical and professional development initiatives.

# Midwest Hydrogen Hub

Selectee: Midwest Alliance for Clean Hydrogen (MachH2)



## Project Overview

Prime Applicant:  
**Midwest Alliance for Clean  
Hydrogen (MachH2)**

Locations:  
**Illinois, Indiana, Michigan**

Federal Cost Share:  
**Up to \$1 Billion\***

\*Pending negotiations

## Production

- Thermal conversion
- Electrolysis

## Midstream

- Hydrogen refueling stations
- Steel and glass production
- Power generation
- Refining
- Heavy duty vehicles
- Sustainable aviation fuel

## End Uses

# Midwest Hydrogen Hub

Selectee: Midwest Alliance for Clean Hydrogen (MachH2)



## Community Benefits - Highlights



Creation of over 13,600 jobs, including 12,100 construction jobs, and 1,500 permanent jobs.



Created specific targets, including 40% of total subcontracted dollars going to Minority/Disadvantaged Business Enterprises (M/DBEs), roughly \$30 million for new startups through an inclusive entrepreneurship program (focusing on M/DBEs), and a target of 45% diverse hiring.



Plan to invest \$15 Million in wrap-around services for a worker education program.

# Pacific Northwest Hydrogen Hub

Selectee: PNWH2

## Project Overview

Prime Applicant:  
**Pacific Northwest Hydrogen Association**

Locations:  
**Montana, Oregon, and Washington**

Federal Cost Share:  
**Up to \$1 Billion\***

\*Pending negotiations

## Production

- **Electrolysis**

## Midstream

- **Freight network between California & Pacific Northwest Hubs**

## End Uses

- **Heavy duty vehicles**
- **Ports**
- **Peaking plants / generators**
- **Refineries**
- **Data centers**



# Pacific Northwest Hydrogen Hub

Selectee: PNWH2



## Community Benefits - Highlights



Creation of over 10,000 jobs, including more than 8,050 construction jobs, and 350 permanent jobs.



Committed to negotiating Project Labor Agreements (PLAs) for all projects over \$1 million and investing in joint labor-management/state-registered apprenticeship programs.



Prioritizing hiring programs for former coal industry workers and investing more than \$4 million in the Centralia College training center to provide worker training.

\*Pending negotiations

# Next Steps & Resources



Project of Interest Selected/Awarded  
..... Project of Interest not Selected/Awarded

# Get Involved

Project of interest selected (Oct 2023)



## Negotiation

Project awarded



Project not selected

### How to engage during negotiation:

- Visit Hub webpages
- Attend Hub-specific virtual briefing
- Email the H2Hub
- Email DOE at [engage\\_H2Hubs@hq.doe.gov](mailto:engage_H2Hubs@hq.doe.gov)
- Attend local engagements (details TBD)
- Read [Initial CBP summary](#)

DOE will use feedback from engagements to inform the negotiation process

Project not awarded

DOE involvement ends\*

## Implementation Phases 1-4

NEPA engagement

Ongoing engagement throughout phases 1-4

Phase 1: Detailed Plan



Phase 2: Project Development



Phase 3: Install, Integrate, Construct



Phase 4: Ramp-Up & Operate



Up to \$20M DOE funding, ~12-18 months

Up to 15% of total DOE funding, ~2-3 years

DOE Funding to be negotiated, ~2-4 years

DOE Funding to be negotiated, ~2-4 years

Go/No-Go Decisions

CBP Commitments Public

### How NEPA will work:

- **DOE will comply** with the National Environmental Policy Act (NEPA) and related requirements for the Hubs.
- Feedback via early engagement will **inform initial scope of NEPA reviews**.
- **Stakeholder engagement** throughout the NEPA process, including at scoping and draft NEPA document review stages.

# OCED Engagement

OCED aims to support meaningful **community-awardee-OCED** engagement through the life of the awarded H2Hub. **How?**

## Local Engagements



Small community dialogues



Deliberative forum

## Outcomes



Establish process for long-term engagement



Co-develop priorities



## Next Steps – Virtual H2Hub Community Briefings

DOE OCED will hold seven community briefings to share information with the communities hosting H2Hubs.

Information and to register: <https://www.energy.gov/oced/h2hubs-local-engagement-opportunities>

**Appalachian Hydrogen Hub**  
**Tuesday, October 24, 2023**

**Mid-Atlantic Hydrogen Hub**  
**Wednesday, October 25, 2023**

**California Hydrogen Hub**  
**Wednesday, October 25, 2023**

**Gulf Coast Hydrogen Hub**  
**Monday, October 30, 2023**

**Pacific Northwest Hydrogen Hub**  
**Monday, October 30, 2023**

**Midwest Hydrogen Hub**  
**Wednesday, November 1, 2023**

**Heartland Hydrogen Hub**  
**Wednesday, November 1, 2023**

\*Subject to change based on negotiations. Negotiations may take several months.

## Next Steps – Negotiations

**Award Negotiations:** DOE OCED will commence negotiations with project selectees.

**After Award:** *IF the projects receive an award (successful negotiations)*

- Selectees enter into cooperative agreement with DOE OCED
- Detailed Project Plan begins
- OCED will work with selectees to ensure compliance with the National Environmental Policy Act (NEPA)
- Significant engagement with OCED and awardee

# H2Hubs Resources

## Regional Clean Hydrogen Hubs

- [Program Page](#)
- [Press Release](#)
- [Overview of Selected Projects](#)
- [Local Engagement Opportunities](#)
- [OCED CBP fact sheet](#)

## Demand-Side Support Initiative for Clean Hydrogen

- [Request for Proposals \(RFP\)](#)
- [Video: OCED Update on Demand-Side Support Initiative](#)

## Additional Clean Hydrogen Resources

- [U.S. National Clean Hydrogen Strategy and Roadmap](#)
- [Clean Hydrogen Pathways to Commercial Liftoff Report](#)
- [Hydrogen Shot](#)

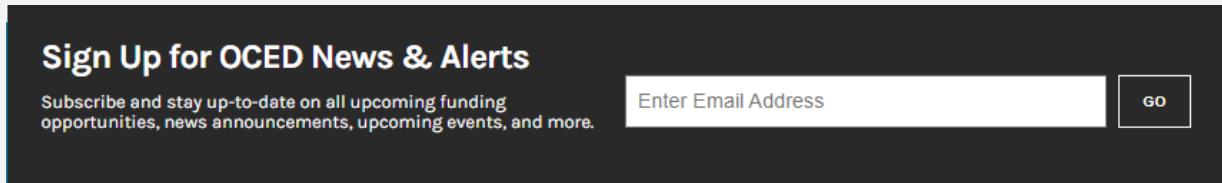
## Justice40 Resources

- [Justice40 Initiative](#)
- [Energy Justice Dashboard \(BETA\)](#)
- [Climate and Economic Justice Screening Tool](#)





For more information

- Reach DOE OCED about the H2Hubs  
[Engage\\_h2hubs@hq.doe.gov](mailto:Engage_h2hubs@hq.doe.gov)
- OCED Website & Newsletter Sign-up  
[energy.gov/oced](http://energy.gov/oced)  
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# Selectee Webpages

**Appalachian Hydrogen Hub**

<https://www.arch2hub.com/>

**California Hydrogen Hub**

<https://archesh2.org/>

**Heartland Hydrogen Hub**

**Forthcoming**

**Gulf Coast Hydrogen Hub**

<https://www.hyvelocityhub.com>

**Mid-Atlantic Hydrogen Hub**

<https://mach-2.com/>

**Midwest Hydrogen Hub**

<https://machh2.com/>

**Pacific Northwest Hydrogen Hub**

<https://pnwh2.com/>





# Thank you!



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For more information; please visit [energy.gov/OCED](http://energy.gov/OCED)