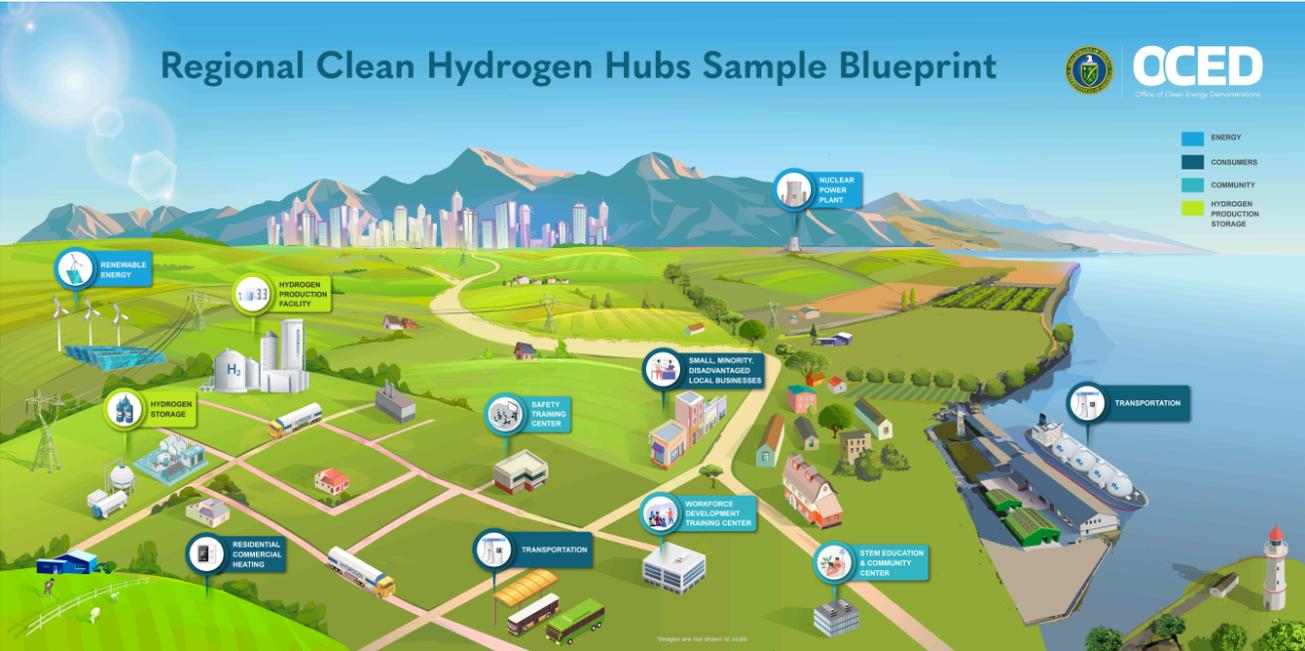


Regional Clean Hydrogen Hubs Selections for Award Negotiations



 [Click on image to view a larger version.](#)

Awarded Hubs

Appalachian Hydrogen Hub (ARCH2)

Learn more about the Appalachian Hydrogen Hub.

[VIEW MORE](#)



California Hydrogen Hub (ARCHES)

Learn more about the California Hydrogen Hub.

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Gulf Coast Hydrogen Hub

Learn more about the Gulf Coast
Hydrogen Hub.

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Midwest Hydrogen Hub (MachH2)

Learn more about the Midwest
Hydrogen Hub.

[VIEW MORE](#)



Pacific Northwest Hydrogen Hub (PNWH2)



Learn more about the Pacific Northwest Hydrogen Hub.

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Selections Under Award Negotiation

Project Name: Heartland Hydrogen Hub

Selectee name: Heartland Hub (HH2H)

Location: Minnesota, North Dakota, and South Dakota

Federal Cost Share: up to \$925 million

Prime Contractor: Energy & Environmental Research Center (EERC)

Summary: The Heartland Hydrogen Hub consists of project locations across North Dakota, South Dakota, and Minnesota, with the potential to expand into neighboring states, that will leverage the region's abundant energy resources to help decarbonize the agricultural sector's production of fertilizer and decrease the regional cost of clean hydrogen. The Heartland Hydrogen Hub also proposes to

use clean hydrogen for power generation in a manner that may catalyze co-firing hydrogen in utility-owned generation across the country. The Hub plans to offer unique opportunities of equity ownership with the Mandan, Hidatsa and Arikara Nation and to local farmers and farmer co-ops through a private sector partnership that will allow local farmers to receive more competitive pricing for clean fertilizer. These initiatives can help reduce roughly 1 million metric tons per year of carbon emissions—roughly equivalent to the annual emissions of 220,000 gasoline-powered cars—while extending profit-sharing and benefits from the expanding hydrogen economy to wider communities, a model with the potential for replication across the Midwest. The Heartland Hydrogen Hub’s use of open access storage and pipeline infrastructure will create a hydrogen network accessible to both current and new hydrogen users.

The Heartland Hydrogen Hub has committed tens of millions of dollars to create an education consortium to oversee career development, workforce training, apprenticeship programs, and K-12 STEM education, which includes several tribal colleges and universities. A goal of the Heartland Hydrogen Hub is to contract hundreds of millions of dollars for businesses owned by women, minorities, disabled veterans, disadvantaged communities, or LGBTQ persons. The Heartland Hydrogen Hub anticipates creating upwards of 3,880 direct jobs—3,067 in construction jobs and 703 permanent jobs. To oversee implementation of the Community Benefits Plan (CBP), this H2Hub intends to create a CBP Advisory Board.

For more information, email HeartlandH2Hub@hq.doe.gov.

Project Name: Mid-Atlantic Hydrogen Hub

Selectee name: *Mid-Atlantic Clean Hydrogen Hub (MACH2)*

Location: Pennsylvania, Delaware, and New Jersey

Federal Cost Share: up to \$750 million

Prime Contractor: Mid-Atlantic Clean Hydrogen Hub, Inc.

Summary: The Mid-Atlantic Hydrogen Hub spans the Delaware River and includes Pennsylvania, Delaware, and southern New Jersey. The Mid-Atlantic Hydrogen Hub will help unlock hydrogen-driven decarbonization in the Mid-Atlantic while repurposing historic oil infrastructure and using existing rights-of-way. The Mid-Atlantic Hydrogen Hub plans to develop renewable hydrogen production facilities from renewables and nuclear electricity using both established and innovative electrolyzer technologies, where it can help reduce costs and drive further technology adoption. It aims to expand hydrogen application to industries including heavy transportation (e.g., trucks, buses, refuse trucks, and street sweepers), manufacturing and industrial process improvements, and combined heat and power, where it can significantly reduce carbon emission by approximately 1 million metric tons per year, which is roughly equivalent to the emissions from 220,000 cars annually. Along with hydrogen production, the Mid-Atlantic Hydrogen Hub plans to expand hydrogen distribution infrastructure, upgrade bus mechanic depots, and develop fueling stations to facilitate hydrogen distribution to more end users. The expansion of hydrogen infrastructure will lower the costs of storage and distribution and ultimately assist with reducing the cost of hydrogen and achieving anticipated emissions reductions.

As part of its labor and workforce commitments to the community, the Mid-Atlantic Hydrogen Hub plans to negotiate Project Labor Agreements for all projects and provide close to \$14 million for regional Workforce Development Boards that will serve as partners for community college training and pre-apprenticeships. The Mid-Atlantic Hydrogen Hub was developed in partnership with labor and minority-serving institutions, including the Philadelphia Building Trades and Cheyney University and intends to support apprenticeship and pre-apprenticeship programs, certificated and stackable credentials, and wraparound services that enable training and employment. The Mid-Atlantic Hydrogen Hub anticipates creating 20,800 direct jobs—14,400 in construction jobs and 6,400 permanent jobs. Hub partners have agreed to union neutrality and will abide by good faith negotiations. To overcome barriers for underrepresented groups, this Hub plans to provide an additional \$10 million for technical and professional development initiatives, such as an on-site, hands-on hydrogen training program at Cheyney University, the oldest HBCU in the country. Additional benefits include air pollutant reduction and brownfield remediation. To ensure accountability, the Mid-Atlantic Hydrogen Hub plans to create a Community Advisory Board and establish third party verification.

FAQs

What is Clean Hydrogen?

Clean hydrogen refers to hydrogen produced through electrolysis—separating liquid water into hydrogen—using renewable or low-carbon emissions energy sources, such as wind, solar or nuclear. Clean hydrogen can also refer to hydrogen produced using thermal conversion processes with carbon capture and permanent storage (CCS) technologies that reduce greenhouse gas emissions.

As such, clean hydrogen technologies can enable reduced emissions compared to traditional fossil fuels, either by virtue of the production method or through CCS.

Learn more about clean hydrogen in this video:

<https://www.youtube.com/watch?v=hi6rx5Ck8Ms>

What is a Hydrogen Hub?

Regional Clean Hydrogen Hubs (H2Hubs) are networks of clean hydrogen producers, consumers, and connective infrastructure that will help accelerate the large-scale production and use of clean hydrogen. Funded by the Bipartisan Infrastructure Law (BIL), DOE is announcing \$7 billion to jumpstart the hydrogen economy by establishing these H2Hubs, which will be met with the H2Hubs selectees' cost share of more than \$40 billion.

- Hydrogen Production: Together, the H2Hubs are expected to produce nearly 8,000 metric tons of hydrogen tons per day—equivalent to 3 million metric tons per year—which is nearly 30 percent of the [U.S. National Clean Hydrogen Strategy](#).

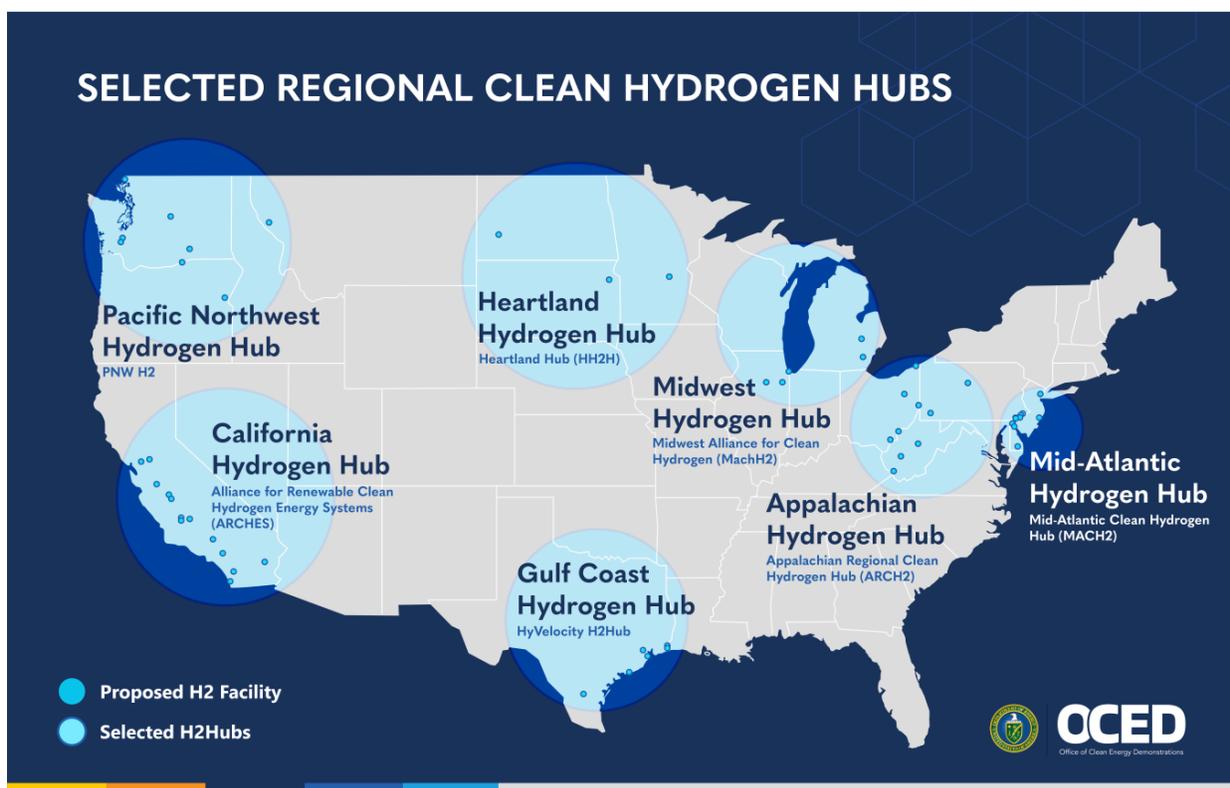
and Roadmap's goal of producing 10 million metric tons of clean hydrogen per year by 2030.

- Hydrogen Consumers/End-Users: H2Hubs end users include industrial use, including steel, synthetic fuel production and other uses; transportation, including fuel cell vehicles, maritime, heavy-duty transportation, and more; residential and commercial heating; and electric power generation, including energy storage and backup power.
- Connective Infrastructure: The H2Hubs will develop storage facilities, refueling stations, pipelines, and other necessary infrastructure to connect hydrogen production with its point of consumption.

In addition to these three key infrastructure elements, H2Hubs must also provide meaningful, tangible benefits to host communities and workers—for example through quality permanent jobs; reduction in air pollution; and equitable access to enterprise creation—so that all Americans can benefit from the clean hydrogen economy.

Where are the H2Hubs located?

The seven H2Hubs will be in different regions across the United States. See the below map for more details.





Click on image to view a larger version.

How will the selected H2Hubs produce clean hydrogen?

Hydrogen is a versatile fuel that can be produced from clean, diverse, and domestic energy resources, including wind, solar, and nuclear energy, or by using methane while capturing and safely storing resulting carbon dioxide to reduce emissions. Every geographic region of the nation has its own strengths in terms of available fuels to produce hydrogen and the Bipartisan Infrastructure Law recognizes that by specifying, among other requirements, that at least two of the Hubs be located in natural gas-rich regions, at least one Hub use fossil fuels with carbon capture, one Hub use nuclear power, and one Hub use renewable energy as a feedstock. Of the seven H2Hubs chosen, two exclusively use renewable energy and the other five use some combination of renewables, nuclear power, and natural gas with carbon capture and storage to produce clean hydrogen. Of the total project investment, roughly two-thirds are associated with green (electrolysis based) production, within the H2Hubs. Any H2Hub producing carbon dioxide as an output of the hydrogen production process must have plans to store the CO₂ permanently and safely. The Bipartisan Infrastructure Law also requires that each of the Hubs can produce hydrogen that demonstrably meets the [Clean Hydrogen Production Standard](#).

The selected H2Hubs will reduce harmful greenhouse gas emissions and pollutants across the full life cycle compared to current and conventional technologies and processes. To ensure this, DOE required H2Hub applicants to perform a preliminary life cycle assessment for the Hub, which included hydrogen production and utilization. As part of the review and selection process, DOE evaluated and analyzed the estimated emissions of each Hub. Where data was not provided by the applicant, DOE used the defaults within the [Argonne National Laboratory's GREET model](#) to evaluate the well-to-gate emissions/carbon intensity and criteria pollutants of the proposed Hub. These estimated greenhouse gas emission intensities were then reviewed as part of the critical evaluation phase and used to support the meritorious assessment of the Hub. DOE expects the H2Hubs to employ state-of-the-art

technologies and best practices to mitigate emissions (greenhouse gas and criteria pollutants) within their facilities, and DOE will reassess the carbon intensity of the H2Hubs [throughout the project lifecycle](#) and evaluate the H2Hubs by the degree to which they reduce well-to-gate emissions.

Why is DOE investing in clean hydrogen technologies?

The Bipartisan Infrastructure Law mandates \$9.5 billion of direct investment in clean hydrogen and the Inflation Reduction Act (IRA) provides robust incentives for additional private-sector investment in clean energy, including clean hydrogen. DOE is committing \$7 billion to establishing H2Hubs, \$1 billion toward strengthening the demand for clean hydrogen, and \$1.5 billion towards advancing electrolysis technologies and improving manufacturing and recycling capabilities for all clean-hydrogen technologies.

Together, these investments and ongoing research, development, and demonstration will help realize the [DOE Hydrogen Shot goal](#) of reducing the cost of clean hydrogen to \$1 per kilogram within a decade. Accelerating the development of clean hydrogen and enabling its widespread commercial adoption is critical to creating good-paying jobs and new economic opportunities in communities across the nation while also supporting the Biden-Harris Administration's ambitious climate goals.

What are the benefits of the H2Hubs?

H2Hubs will help unlock a new source of clean fuel and energy storage to help decarbonize the economy. The program will make the U.S. a leader in clean hydrogen technology and facilitate the transition to a low-carbon or carbon-free future, while providing a key enabling technology for reducing emissions in hard-to-decarbonize sectors like heavy industry and transportation. Together, the H2Hubs will eliminate 25 million metric tons of carbon dioxide emissions from end-uses each year—an amount roughly equivalent to combined annual emissions of 5.5 million gasoline-powered cars.

Collectively, the H2Hubs will create tens of thousands of good-paying jobs across the country. While each Hub will have unique benefits, examples of benefits that Hubs may provide include: reduction in air pollution (e.g., particulate matter), for example by replacing diesel trucks with fuel cell vehicles; remediation of legacy pollution by cleaning up legacy sites that will serve as production or end use facilities; investment in education and workforce development; creation of quality, permanent, local jobs; enterprise creation; equity partnerships; and energy resiliency. In all cases, DOE emphasizes the importance of ensuring these benefits flow to the host communities and especially those that are disadvantaged, face barriers to employment, and have typically been excluded from the benefits of energy or infrastructure projects.

How does DOE plan to address risks associated with the H2Hubs?

Ensuring safe deployment and mitigating social, economic, technical, and environmental risks associated with the H2Hubs is of the utmost importance to DOE and central to our project management approach. DOE will work with the H2Hubs, communities, and appropriate authorities to mitigate and address risks proactively and continually throughout the duration of the projects.

Funded projects must submit detailed risk assessments and risk management plans outlining potential risks and impacts, and how they will mitigate those impacts. In addition, they will submit a Hydrogen Safety Plan that will outline their approach to produce, store and transport hydrogen safely.

They must also submit detailed [Community Benefits Plans](#), including how the project performers will partner with workers and host communities to transparently communicate, eliminate, mitigate, and minimize risks or potential negative impacts associated with the project. The H2Hubs will also develop an environmental information volume, obtain all needed permitting approvals, and comply with all appropriate environmental laws, including the National Environmental Policy Act, or NEPA. The Hubs will assess and

address relevant federal statutes and authorities that could include, but are not limited to: Clean Air Act, Clean Water Act, Endangered Species Act (ESA), and National Historical Preservation Act (NHPA). When needed, the DOE and Hubs will coordinate with other Federal agencies such as Department of Transportation or the Environmental Protection Agency.

How were the H2Hubs selected?

Following a Request for Information in Spring 2022 to solicit public input, DOE solicited applications for H2Hubs with a Funding Opportunity Announcement (FOA) in September 2022, and conducted merit reviews of eligible project submissions in 2023. The merit review criteria included:

- **Technical Merit and Impact**, including but not limited to the ability of the proposed hub to deploy infrastructure and produce at least 50-100 metric tons of clean hydrogen per day and reduce greenhouse gas emissions.
- **Financial and Market Viability**, including growth potential and market competitiveness of the proposed hub.
- **Workplan**, including the speed at which the Hub could begin operations and overall project management details.
- **Management Team and Project Partners**, including the team's ability to execute the plan with a high level of success.
- **Community Benefits Plan**, including an assessment of community and labor engagement, quality job creation and workforce development, diversity equity inclusion and accessibility, and the Justice40 initiative.

Rigorous reviews of eligible submissions were conducted by internal and external reviewers that are experts in the subject matter of the FOA. Ultimately, the Selection Official(s) considered the recommendations of the reviewers with respect to individual proposals, but also applied a portfolio approach to ensure the selected projects satisfied all of the statutory requirements with respect to feedstock diversity, end use, and geographic diversity. In this last regard, the seven hydrogen hubs selected represented seven different regions of the country.

Will 45V tax guidance impact DOE's funding of the H2Hubs?

Individual project teams within each H2Hub will make commercial decisions with the guidance available and DOE will negotiate with the Hub teams based on those decisions. The ability of specific Hub-affiliated projects to qualify for the 45V credit will depend on final Treasury and IRS guidance.

What is a Community Benefits Plan?

By prioritizing tangible community benefits, OCED helps ensure the next chapter in America's energy story is marked by greater justice, equity, security, and resilience. As part of this priority, OCED requires all funding opportunity applicants to create and, if awarded funding, implement a [Community Benefits Plan](#) (CBP). CBPs are based on a set of four core interdependent policy priorities: engaging communities and labor; investing in America's workforce; advancing diversity, equity, inclusion, and accessibility; and implementing the Justice 40 Initiative.

A key goal of CBPs is to create systems of transparency and accountability between projects and impacted communities and workers. Each project and community will be different, and these systems could include, for example, voting rights on governing boards, community advisory bodies, public data dashboards, and/or negotiated workforce and community agreements. These types of structures provide pathways for creating shared priorities and supporting overall project success.

OCED is developing a highly structured and rigorous approach to our management and oversight of all aspects of a project – including community benefits – from project selection through construction and operation. The quality of CBPs will impact a project's selection and ongoing evaluation throughout its lifecycle. CBPs comprised 20 percent of an application's score for the H2Hubs program. OCED has supported project applicants during this initial application period by developing CBP guidance documents posted with our funding opportunities. For an example, see: [CBP Guidance for Regional Clean Hydrogen Hubs](#).

Project selection will only lead to award if projects successfully complete the negotiation process. During negotiation, OCED will work with selectees to strengthen CBPs and address weaknesses. Hydrogen Hub projects that receive an award will move to the planning phase, the first of OCED's four project phases (planning, development, construction, and operation), and will begin implementing their CBP commitments. Between each phase is a go/no-go decision that considers how well a project is meeting its technical, financial, and community benefits commitments to determine whether an awardee can progress to the next phase and receive additional funding. CBPs are expected to evolve during each phase in response to community and worker input.

Summaries of the CBPs can be found under the above project summaries. CBP commitments will be made publicly available after OCED awards are made.

How will labor and workers be engaged?

As part of their Community Benefits Plans, applicants were required to demonstrate how they would create quality jobs, support equitable workforce development, and engage labor. While each H2Hubs is different, many have already begun deep engagement with unions and labor partners, for example by having union representatives on the Hub governing board, by agreeing to pursue collective bargaining agreements, or by partnering for workforce development initiatives.

To support connections between labor and selected H2Hubs, DOE is proactively engaging national, state, and local labor groups early and often; initially through a National Labor Briefing to be followed by subsequent H2Hub-specific and localized engagements (details forthcoming). DOE will continue to proactively engage and hold project performers accountable to their CBP commitments throughout the lifecycle of the H2Hubs projects. Learn more about [H2Hubs local engagement opportunities here](#).

DOE supports creating domestic energy and supply chain jobs with good pay, benefits, predictable schedules, and with assurances that workers will have a free and fair chance to join or form a union. By supporting such

employment practices, DOE seeks to ensure that the efficiency, ingenuity, and skill of the American workforce is the foundation of our nation's competitive advantage in the global energy industry and related supply chains.

How will local communities near H2Hubs be engaged?

Communities will have substantive opportunities to engage with both DOE and Hub projects—starting during the negotiation process and extending throughout the full lifecycle of each project. In fall 2023, before projects are awarded, the Office of Clean Energy Demonstrations (OCED) began these engagements by co-hosting virtual community briefings with the selected project teams to engage and build relationships with local stakeholders. Additional engagement opportunities will be planned on a Hub-by-Hub basis. DOE may use information gained during these engagements to inform the negotiation process.

H2Hubs that are successfully negotiated and awarded are required to implement their Community Benefits Plans, including engaging with community and labor groups; investing in America's workforce; advancing diversity, equity, inclusion, and accessibility; and supporting the Justice40 Initiative. While each H2Hub is unique, all must pursue robust activities in these four areas—many are creating specific community advisory and/or workforce advisory groups to ensure sustained, meaningful engagement and transparency. These plans are intended to evolve in response to community and workers input and will be assessed at each phase as part of DOE's go/no-go decision points.

Additionally, H2Hubs must comply with all appropriate environmental and cultural resource review laws, including the National Environmental Policy Act, or NEPA and Section 106 of the National Historic Preservation Act, which ensures that decision-makers and the public are fully informed of the environmental impacts of the projects. A major component of Section 106 is to encourage early and meaningful engagement with tribal entities, other federal and state agencies, and public stakeholders throughout the course of federal decision-making. NEPA and Section 106 have become some of the

primary mechanisms through which Tribal Nations and the public are able to participate in the federal decision-making process.

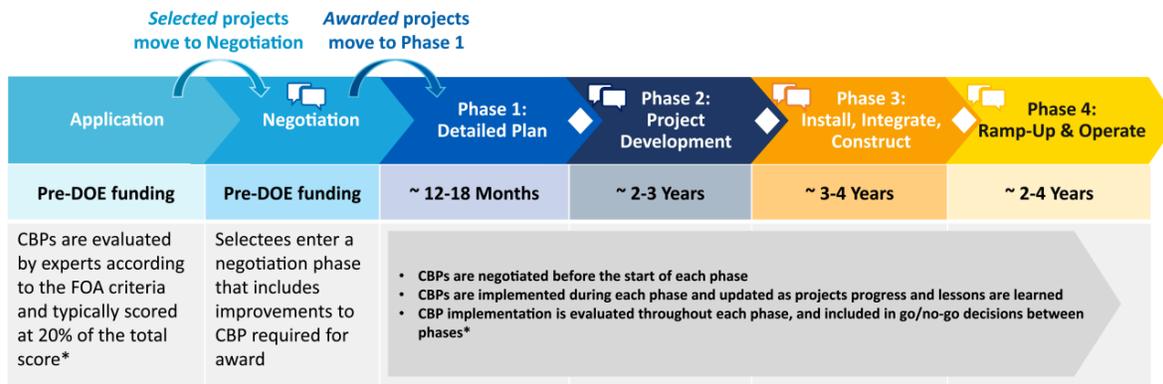
In addition, DOE recognizes its federal trust responsibilities and government-to-government relationship with federally recognized tribes and looks forward to strengthening those connections during the course of these projects.

DOE intends for the H2Hubs to be developed in four phases, allowing ample time for input from local stakeholders, community engagement, and evaluation of all potential opportunities and risks for a local community.

What are the stages of Community Benefits Plan Development?

Community Benefits Plan commitments are developed throughout the project and project funding is approved in phases to awardees. The next phase of funding is only provided to awardees if they have successfully completed their milestones in each phase. Community Benefits Plan milestones are included in each phase of funding and awardees will be required to meet them.

Below is a graphic that shows how CBPs align with the OCED phased project management approach.



*CBPs are considered alongside assessments of engineering, procurement, and construction; business development and management; permitting and safety; and technical data and analysis.



- o Application (Proposal Review and Selection):
 - Applicants submit preliminary Community Benefits Plans as part of their application for federal funding. They also submit letters of support from

- communities, labor, and other stakeholders.
- Community Benefits Plans are reviewed and scored during merit reviews.
- Negotiations:
 - Once projects are selected for award negotiations, the merit reviewers' feedback can be used to inform project negotiations to improve the projects further before the first phase of funding is awarded.
 - Summaries of the selected project Community Benefits Plans are shared publicly.
 - DOE cannot share full information on the Community Benefits Plans because the scope of the projects and awards are not finalized.
- Phases 1-4:
 - During each phase of funding, each Hub awardee will actively engage with host communities, workers, and other stakeholders to implement their Community Benefits Plan commitments.
 - For instance, in the planning and permitting Phases (1 and 2) Community Benefits Agreements and Project Labor Agreements may be negotiated, and then implemented during the construction and operation Phases (3 and 4).
 - Successful implementation of the Community Benefits Plans commitments will inform "go/no-go" decisions of the Project.
 - Community Benefits Plan commitments for the following Phase are negotiated during the previous Phase.

For more information on the award negotiations process, visit: [Award Negotiations | Department of Energy](#).

Who should I contact with questions or concerns?

For more information about the H2Hubs program, please contact DOE at: Engage_H2Hubs@hq.doe.gov

For questions about a specific H2Hub, please contact DOE at:

- AppalachianH2Hub@hq.doe.gov
- CaliforniaH2Hub@hq.doe.gov
- GulfCoastH2Hub@hq.doe.gov
- HeartlandH2Hub@hq.doe.gov
- MidAtlanticH2Hub@hq.doe.gov
- MidwestH2Hub@hq.doe.gov
- PacificNWH2Hub@hq.doe.gov

What is the hydrogen demand-side initiative?

The hydrogen demand-side initiative is a component of the H2Hubs Program and seeks to ensure that both producers and end users in the H2Hubs have the market certainty they need during the early years of production to secure offtake agreements, unlock private investment, and realize the full potential of clean hydrogen on a national-scale. Hydrogen projects affiliated with the H2Hubs will be eligible to qualify for demand-side support under this initiative.

In January 2024, DOE announced the selection of a consortium to support design of demand-side support mechanisms as part of this initiative. The consortium consists of the EFI Foundation (EFIF), in partnership with S&P Global (S&P) and the financial exchange operator Intercontinental Exchange (ICE). This consortium will work with DOE and the selected H2Hubs to design a demand-side mechanism or mechanisms that can “unlock” final investment decisions for H2Hubs and help accelerate commercial liftoff of the clean hydrogen economy.

The demand-side support mechanism will be determined over the course of 2024, in partnership with EFIF, S&P, and ICE, and with input from the H2Hubs and the private sector. Possible mechanism types include pay-for-difference contracts, revenue backstops, or offtake guarantees. In June 2024, DOE finalized its Other Transactions agreement with the H2DI consortium. Through the agreement, H2DI will work to design demand-pull mechanisms to derisk H2Hubs projects and plan for executing those mechanisms in partnership with DOE.

DOE is dedicating a portion of the remaining funding from the H2Hubs program towards this initiative.

How was the consortium selected?

The consortium was selected after a competitive Request for Proposal process that evaluated applicants on five key evaluation criteria: 1) market experience and expertise; 2) operational ability; 3) ecosystem credibility; 4)

strength of proposal for a demand-side mechanism; and, 5) business systems and processes.

Why has DOE chosen a third-party entity to partner with the hydrogen demand-side initiative?

Working with a third-party independent entity grants more flexibility to contract with projects and also allows DOE to access expertise in commercial contracting and project finance that the Department may not already have in-house. DOE will incorporate rigorous guardrails and governance controls into its agreements with the entity to ensure that DOE maintains oversight of federal funds. DOE plans to implement this program through its Other Transaction Agreement authority, which allows the Department to flexibly work with the consortium to provide tailored catalytic support to Hydrogen Hub projects.

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