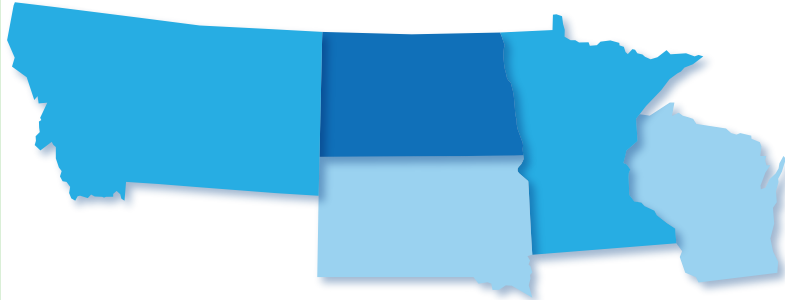




# ADVANCING CLEAN, SUSTAINABLE HYDROGEN DEVELOPMENT



The Heartland Hydrogen Hub (HH<sub>2</sub>H) advances the potential development of a clean, sustainable hydrogen hub across several states and contributes to meaningful economic and community benefits.

## HH<sub>2</sub>H INTRODUCTION

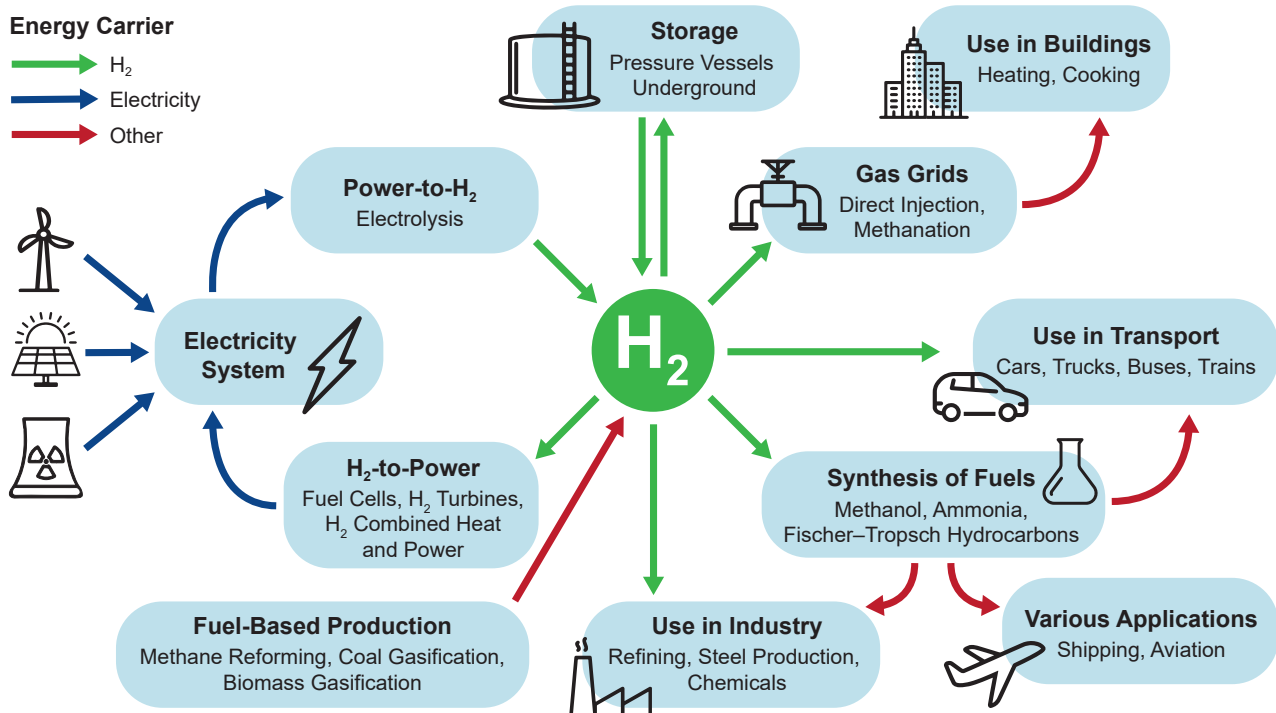
The Energy & Environmental Research Center (EERC), Marathon Petroleum Corporation (MPC), TC Energy, and Xcel Energy are leading HH<sub>2</sub>H's development and have the resources and expertise to drive HH<sub>2</sub>H's success.

The governors of Minnesota, Montana, North Dakota, and Wisconsin signed a memorandum of understanding outlining their commitment to HH<sub>2</sub>H's development and designated the EERC to lead the effort. The states have a shared interest in U.S. energy production, energy security, job creation, economic development, and environmental stewardship.

Xcel Energy will use its wind generation resources in the region to produce clean hydrogen that business partner One Earth Renewables of Morris, Minnesota, will use in

carbon-neutral fertilizer production. Xcel Energy also plans to use its nuclear, solar, and wind resources to produce clean hydrogen to blend into existing natural gas distribution systems and power generation. MPC and TC Energy are collaborating to produce clean hydrogen in North Dakota for industrial use, ammonia-based fertilizers, and natural gas blending. MPC and TC Energy are engaged with the Mandan, Hidatsa, and Arikara Nation and Sumitomo Corporation of Americas to establish their meaningful participation in the initiative.

HH<sub>2</sub>H is seeking funding from the U.S. Department of Energy's (DOE's) Regional Clean Hydrogen Hub Program which includes up to \$7 billion to establish regional clean hydrogen hubs across the United States.



## HH<sub>2</sub>H HIGHLIGHTS

The HH<sub>2</sub>H consists of multiple clean hydrogen production facilities, uses, and connective infrastructure.

**HYDROGEN PRODUCTION** | HH<sub>2</sub>H would produce commercial-scale quantities of clean hydrogen at a rate considerably exceeding DOE's minimum requirement.

**TECHNOLOGY DIVERSITY** | HH<sub>2</sub>H would integrate technically diverse clean hydrogen projects utilizing energy sources, including wind, solar, nuclear, and natural and renewable gas.

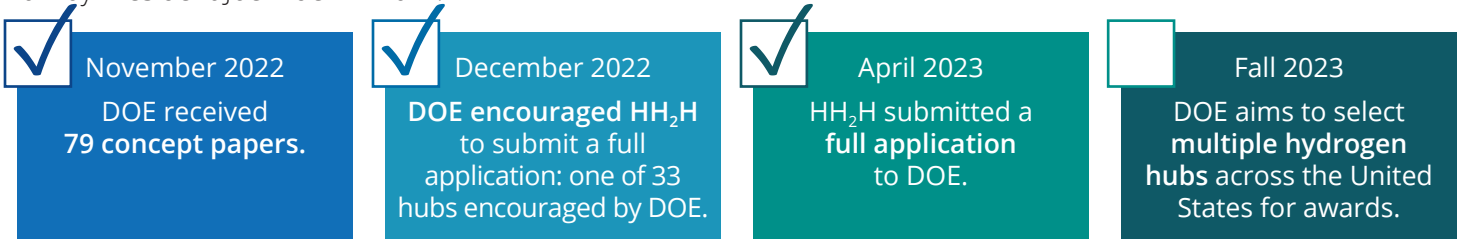
**HYDROGEN END USES** | Hydrogen would be used in ammonia, urea fertilizer, natural gas pipeline blending for power generation and local distribution facilities, and industrial operations.

**CO<sub>2</sub> EMISSIONS** | The estimated CO<sub>2</sub>-equivalent reduction is greater than 1 million metric tons per year.

**COMMUNITY RELATIONS AND BENEFITS** | HH<sub>2</sub>H partners will continue to build on the strong relations they have developed over decades with the communities and other stakeholders within the HH<sub>2</sub>H region. HH<sub>2</sub>H partners will work to create shared prosperity in the project region and contribute to the Biden Administration's Justice40 goal, which aims to ensure 40% of overall benefits of federal investments flow to disadvantaged communities.

## TIMELINE FOR FUNDING APPLICATION

The clean hydrogen hub funding is part of the Bipartisan Infrastructure Law approved by Congress and signed into law by President Joe Biden in 2021.



## HH<sub>2</sub>H PARTNERS

**The Energy & Environmental Research Center** is a leading developer of cleaner, more efficient energy to power the world and environmental technologies to protect and clean our air, water, and soil.

**Marathon Petroleum Corporation** is a leading, integrated, downstream energy company headquartered in Findlay, Ohio, operating the nation's largest refining system and branded fuel retail outlets across the United States. Marathon Petroleum also owns general partner MPLX LP, a midstream company that owns and operates gathering, processing, and fractionation assets, including crude oil and light product transportation and logistics infrastructure.

**TC Energy Corporation**, based in Calgary, Alberta, Canada, develops and operates energy infrastructure in Canada, the United States, and Mexico consisting of natural gas pipelines, liquids pipelines, and power and energy solutions. TC Energy leverages its size and scale to be the most trusted and reliable source of low-carbon energy for the North American industrial, oil, and natural gas sectors.

**Xcel Energy**, headquartered in Minneapolis, Minnesota, is a major U.S. electricity and natural gas company, providing a comprehensive portfolio of energy products and services to 3.7 million electricity customers and 2.1 million natural gas customers in eight western and midwestern states.

For more information contact:

John Harju, Ph.D.  
VP for Strategic Partnerships  
701.777.5157 | jharju@undeerc.org

**Energy & Environmental Research Center**  
University of North Dakota  
15 North 23rd Street, Stop 9018  
Grand Forks, ND 58202-9018  
701.777.5000  
[www.undeerc.org](http://www.undeerc.org)

