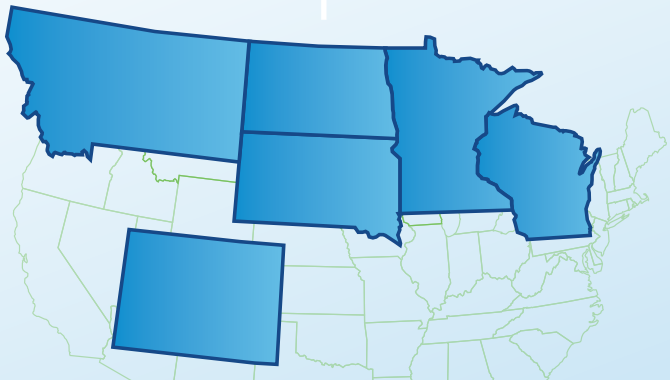
HEARTLAND HYDROGEN HUB

ADVANCING CLEAN, SUSTAINABLE HYDROGEN DEVELOPMENT

EERC
UND UNIVERSITY OF NORTH DAKOTA



The Heartland Hydrogen Hub℠ (HH2H)

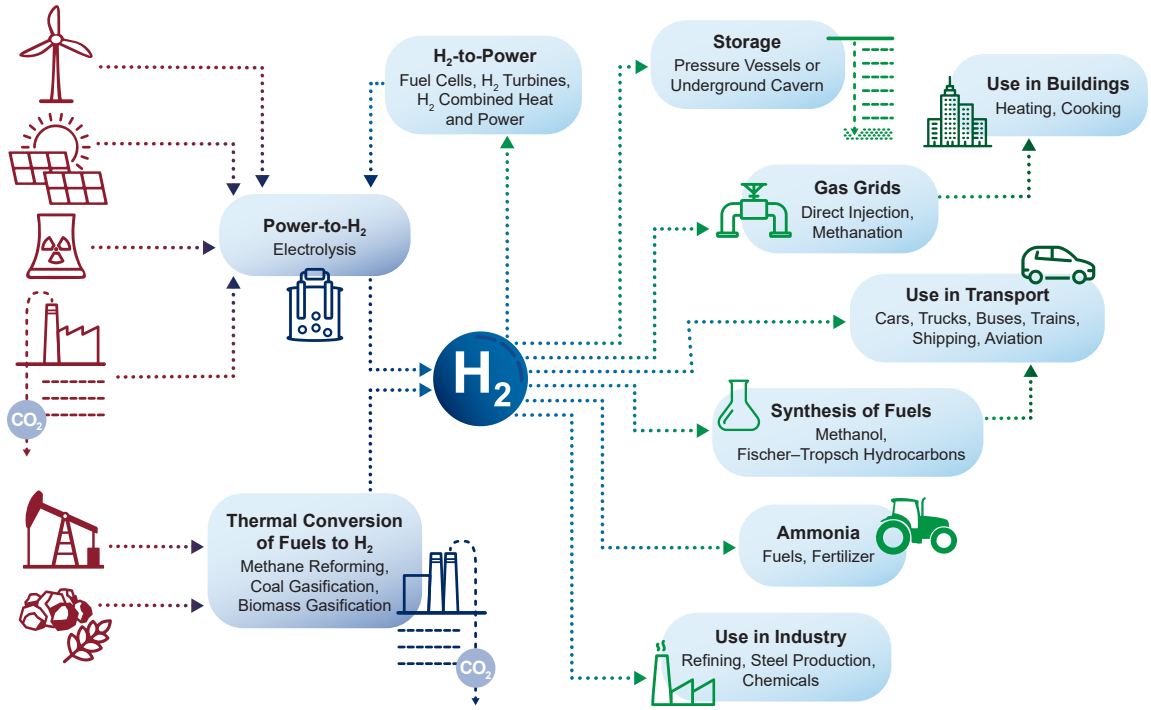
advances the potential of a clean, sustainable hydrogen hub across six states to strengthen America's energy independence and boost regional economies.

HH2H INTRODUCTION

HH2H is one of seven hubs under the U.S. Department of Energy (DOE) Office of Clean Energy Demonstrations H2Hub program to establish commercial-scale hydrogen energy development across the nation. Located in America's heartland, HH2H's goal is to develop regional hydrogen energy projects that add value to the hub's fossil and renewable energy resources by diversifying energy production and use opportunities. In the heartland, this means using regionally produced hydrogen to manufacture fertilizer, fuels, and other chemicals while also enabling hydrogen-based power and transportation. Through collaboration within HH2H and across the other hubs, hydrogen energy development will drive economic growth and position the United States at the forefront of energy deployment, supporting continued energy reliability and independence.

Heartland Hydrogen Hub, LLC, is leading this effort with program management from the University of North Dakota Energy & Environmental Research Center (EERC) and project partners Atlas Agro North America Corp. (Atlas Agro) and Xcel Energy Services Inc. (Xcel Energy). HH2H seeks to establish clean hydrogen projects that leverage diverse resources and markets; demonstrate sustainable business models with potential for growth; and develop a highly skilled, regional clean energy workforce.

UNLIMITED POSSIBILITIES: Connecting Hydrogen to the World



HH2H HIGHLIGHTS

HH2H consists of multiple clean hydrogen production facilities, uses, and connective infrastructure.

HYDROGEN PRODUCTION | HH2H is assessing the economic viability of commercial-scale quantities (~160 metric tons per day) of clean hydrogen and exploring opportunities to expand its quantity and use.

TECHNOLOGY DIVERSITY | HH2H is exploring a diverse mix of hydrogen production technologies and uses to leverage the region's unique energy resources and economy.

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

CO_2 EMISSIONS | The estimated CO_2-equivalent reduction is greater than 525,000 metric tons per year.

HH2H TIMELINE

HH2H aims to accelerate the commercial-scale deployment of low-cost clean hydrogen across the nation. HH2H is a multiyear effort that will be conducted over four phases.

- ☑ **JANUARY 2025:** Finalized Phase 1 contract with DOE
- ☐ **PHASE 1:** Develop plans (24 months*)
- ☐ **PHASE 2:** Engineer designs (~15–24 months)
- ☐ **PHASE 3:** Construction (~24–36 months)
- ☐ **PHASE 4:** Commercial deployment and operations (~1–4 years)

* Duration may be longer because of evolving policy and environmental/permitting requirements.

HH2H PARTNERS

The EERC is a leading developer of cleaner, more efficient energy to power the world and of environmental technologies to protect and clean our air, water, and soil.

Atlas Agro was founded in 2021 with the vision of becoming a global leader in low-carbon nitrogen fertilizer and inspiring fossil fuels-based competition to follow. Atlas Agro aspires to lead the shift to sustainable, locally produced low-carbon fertilizer production, ushering in a new era in agriculture—one that supports robust food production, the long-term health of our planet, and economic development in the communities where we live and work.

Xcel Energy is a recognized leader in delivering safe, clean, and reliable electric and natural gas services. Serving 3.8 million electricity customers and 2.2 million natural gas customers across eight states, Xcel Energy has long been at the forefront of the transition to clean energy technologies while maintaining safe and reliable energy and keeping customer bills as low as possible. As a key partner in HH2H, Xcel Energy will utilize its extensive resources and expertise to contribute significantly to the development and success of the hub.

Learn more about HH2H at
www.HeartlandH2Hub.com

or contact us at
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