

Midwestern Hydrogen Coalition (“M-H₂ Coalition”) MOU
Accelerating and improving clean hydrogen production, processing, and use
A Regional Clean Hydrogen Memorandum of Understanding
Between
Illinois, Indiana, Kentucky, Michigan, Minnesota,
Ohio and Wisconsin

THIS MEMORANDUM OF UNDERSTANDING (“MOU”) is entered into by and between the States of Illinois, Indiana, Kentucky, Michigan, Minnesota, Ohio and Wisconsin (hereinafter referred to as the “Participating States”).

a. BACKGROUND:

Investments in the development of a robust clean hydrogen market, supply chain, and workforce have the opportunity to create good-paying jobs, expand economic opportunity, promote energy independence, and improve public health outcomes. The Participating States recognize the Midwest has advantages in the production, transportation, and end-use of hydrogen to make investments in the hydrogen ecosystem attractive.

Benefits to Participating States

1. Enormous opportunity for innovation and further investment in the country’s essential energy network;
2. Ability to leverage each Participating States’ unique assets to develop a maturing, Midwestern hydrogen market ecosystem;
3. Enable *existing* industries and the jobs they support to remain globally competitive; and catalyze *new* industries and good-paying jobs, including for those left out of previous waves of energy innovation;
4. Enhance energy security and minimize volatility in energy prices through the production of hydrogen by domestic energy sources;
5. Dramatically reduce pollution in the hardest-to-abate sectors; and
6. Long-term reduction in energy costs for consumers in participating states across multiple industries.

The Midwest’s Comparative Advantages

1. **Feedstock Diversity:** The Midwest has a recognized diversity of clean hydrogen production pathways, giving Participating States the opportunity to capitalize on their natural assets.
2. **Existing Hydrogen Infrastructure:** The Midwest has the largest hydrogen infrastructure network in the nation in the form of ammonia production, pipelines, and “nurse” tanks, given that ammonia is an ideal hydrogen carrier. In addition, the region has:

- a. An established market and distribution/storage network for ammonia as an agricultural input, one of the primary existing end-uses for hydrogen. The existing ammonia distribution network is arguably the most extensive hydrogen distribution network in the country,
 - b. A high-volume multi-modal transportation network, and;
 - c. Large potential for co-located gas and CO₂ transport infrastructure.
3. **End Use Diversity:** The Midwest is home to concentrations of difficult-to-decarbonize industries, which are nationally and globally relevant.
4. **Agriculture:**
- a. Participating States have demonstrated leadership on green ammonia (wind to H₂ to NH₃) which can be used as a zero-carbon fuel, for long-duration energy storage, and as a way to transport hydrogen in large volumes. Ammonia production, the vast majority of which is used as an input to Midwestern agricultural production, is the second largest market for hydrogen.
 - b. The Midwest has large-scale opportunities to combine waste sources of CO₂ (e.g., from ethanol plants) with hydrogen as an alternative to fossil-based urea as fertilizer.
5. **Industry:** The Midwest remains a critical industrial and manufacturing hub for the nation. A wide range of industries could benefit from low- and zero-carbon hydrogen and ammonia production. End-use opportunities include oil refining, ammonia production, methanol production and steel production. In addition, the region offers a range of other important end-uses within a hydrogen market ecosystem, such as:
- a. **Transportation:** Medium-and heavy-duty vehicles, Great Lakes shipping, aviation, and rail.
 - b. **Power generation & energy storage:** Blending hydrogen or ammonia in combined-cycle gas turbines for electricity generation.

b. PURPOSE

a. Formation of the Midwestern Hydrogen Coalition (“M-H₂ Coalition”)

Participating States intend to form the **Midwestern Hydrogen Coalition (“M-H₂ Coalition”)**. The **M-H₂ Coalition** will provide a regional framework for establishing a robust clean hydrogen market, supply chain, and workforce ecosystem in the Midwest, including the potential development of one or more hydrogen hub applications. The **M-H₂ Coalition** will further provide the foundation for cooperation to advance economic and energy security, reduce harmful emissions, improve public health, and stimulate innovation among the Participating States.

The **M-H₂ Coalition** will conduct its work by employing a coordinated multi-state, multi-sector approach to developing a robust and sustainable hydrogen economy across the Midwest, informed by industry, academic, and community engagement. Participating States intend that the work of the **M-H₂ Coalition** shall be conducted in a manner to ensure equitable benefit across all communities from the development of clean hydrogen in the region.

c. ACTIVITIES

ACCELERATE DEVELOPMENT OF A MIDWESTERN HYDROGEN ECOSYSTEM

- a. **Participating States will coordinate on the development of a regional hydrogen ecosystem**, including through activities such: selecting a technology-neutral lifecycle carbon-intensity metric for defining clean hydrogen¹; identifying the hydrogen production pathways in their respective states; evaluating infrastructure and workforce opportunities and needs, the most promising end-uses, and financing options.
- b. **Participating States will engage relevant communities in their states as part of the regional hydrogen ecosystem development process**, including key end-use industries, Tribal communities and governments, historically disadvantaged communities, and fossil-fuel dependent communities.
- c. **Participating States may collaborate on the development of one or more hydrogen hub applications.**

FOSTER ECONOMIC GROWTH AND INDUSTRY LEADERSHIP

- a. **Participating States will work with commercial partners, universities, and non-profits to evaluate strategic challenges and opportunities in developing a robust Midwestern market for clean hydrogen, green ammonia**, and related low- and zero-carbon energy carriers and technologies, and jointly develop solutions.
- b. **Participating States will coordinate with existing workforce initiatives and educational institutions to anticipate shifts in workforce demand** and cooperate on workforce development programs to drive job growth and equal access to job opportunities.
- c. **Participating States will work with commercial partners, universities, and non-profits to encourage development of the hydrogen and green ammonia market ecosystem and supply chain** in ways that take full advantage of each State's core competencies.

ADVANCE EQUITY AND CLEAN ENVIRONMENT

- a. **Participating States will work to identify and engage with all communities** to understand both their concerns and their desires with respect to the build out of a clean hydrogen economy and to incorporate that information, as appropriate, into the actions undertaken under this MOU.
- b. **Participating States will seek to align incentives to support clean hydrogen and green ammonia deployment and supply chain development**, invest in appropriate infrastructure, and generate economic opportunity in all communities.
- c. **Participating States will collaborate to foster market conditions for use of clean hydrogen and green ammonia production**, distribution and use in those sectors that yield the greatest reduction in harmful emissions and criteria pollutants.

IDENTIFY ADDITIONAL AREAS FOR COOPERATION

¹ For example, the U.S. Infrastructure Investment and Jobs Act defines qualified "clean hydrogen" as hydrogen produced with a carbon intensity equal to or less than 2 kilograms of CO₂e per kilogram of hydrogen. United States Congress (2021), *House Bill 3684*, <https://www.congress.gov/bill/117th-congress/house-bill/3684/text>

- a. **Participating States will also seek to identify and prioritize uniquely multi-State energy issues**, as the States recognize that differences between States are a clear impediment to much energy-related development.
- b. **Participating States will leverage any cooperation on hydrogen hub proposals to take advantage of other DOE programs, as appropriate.**

d. PROCESS:

1. **Participating States will maintain a Taskforce of senior leadership from each state.** This, along with any additional state stakeholders the Participating States deem necessary, will constitute the **M-H₂ Coalition**.
2. **The M-H₂ Coalition will meet regularly to share updates.** Participating States will determine the schedule.
3. **Participating States will be responsible for maintaining records** consistent with any relevant record retention and transparency requirements.
4. **The M-H₂ Coalition will work with participating commercial partners and other stakeholders to identify barriers to clean hydrogen market development** and work together on recommendations to remove these barriers.
5. **The M-H₂ Coalition will complete reports at regular intervals summarizing progress** made towards the goals set forth in Section(c) of this MOU.
6. **The Participating States will support the M-H₂ Coalition and contribute to ensuring that it is able to accomplish these responsibilities.**

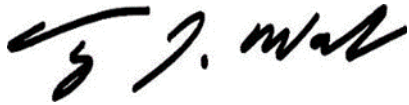
VOLUNTARY INITIATIVE: This MOU is not legally binding and does not create any legal, equitable, or financial rights, commitments, obligations, or liabilities for the Participating States. Any Participating State may cease cooperation under this MOU at any time upon written notice to the other Participating States. This MOU may be amended by a written instrument signed by each Participating State.



J.B. Pritzker Governor of Illinois



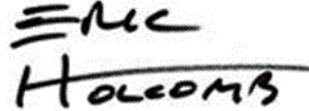
Andy Beshear Governor of Kentucky



Tim Walz Governor of Minnesota



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