THIRD WAY

CLIMATE AND ENERGY PROGRAM | DECEMBER 2025

The Michigan Convening: Prospects of a Geologic Hydrogen Economy, Readout

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In early September, Third Way hosted and facilitated a small convening in Ypsilanti to discuss the potential opportunities for geologic hydrogen exploration within Michigan. Participants included subject matter experts from several state agencies, federal policy experts, and industry representatives. The goal of this convening was to kick off discussion and coordination between stakeholders who would support near-term geologic hydrogen research and be tasked with ensuring any geologic hydrogen pursuits in Michigan, and the US more broadly, maximize opportunities and minimize harm. The convening was divided into three acts, each of which consisted of an expert panel, an audience Q&A, and a table discussion/exercise. This document summarizes the main discussions points, insights, and key questions from participants during the two-day convening while adhering to the Chatham House Rule.

Act I: Geo Hydrogen Rocks: Discussing Its Promise and Realities

The purpose of this section was to ensure that participants had a foundational scientific understanding of geologic hydrogen and how Michigan's subsurface geology makes it an ideal launchpad for a US hydrogen industry.

Michigan's unique geology can be leveraged to create a diversified geologic hydrogen portfolio.

At the start of 2025, the United States Geological Survey (USGS) published a theoretical map which indicated Michigan's vast reserves of geologic hydrogen. In particular, Michigan's lower peninsula contains several rock formations that are conducive for natural hydrogen production via serpentinization, radiolysis, and fluid migration from the lower crust.[1] The lower peninsula also has the potential to be a major hydrogen storage hub due to scores of thick accumulations of sedimentary rock, porous carbonate sandstone, and thick salt deposits, which could be potentially repurposed for subsurface hydrogen storage. Additionally, Michigan's upper peninsula has large deposits of iron-rich rocks and existing iron mines, which can be used for stimulated hydrogen production.

Different types of geologic hydrogen require different types of support.

- **Natural hydrogen:** The main priority for natural hydrogen is de-risking exploratory drilling to help early-movers locate natural hydrogen reservoirs without bankrupting the industry. This requires allocating more funding towards collecting geologic survey data and creating financing mechanisms for projects. Furthermore, the natural hydrogen industry can leverage expertise, data, and strategies from the oil and gas industry to de-risk their drilling operations. For example, exploration tax credits could be created for

the natural hydrogen industry to help offset the costs of drilling operations that fail to yield productive wells, like how intangible drilling cost deductions function for the oil and gas industry. Given the similarities between the two industries, oil and gas majors are primarily backing early efforts by natural hydrogen start-ups.

- **Stimulated Hydrogen:** The main priority for stimulated hydrogen is research and development (R&D), particularly with a focus on aligning the right chemical and catalyst stimulation with the appropriate geology. There is a push to conduct R&D across a wide variety of stimulation approaches to maximize the types of geology that can be used to produce stimulated hydrogen. Philanthropy and the federal government are the primary backers for stimulated hydrogen because scaling this industry is seen as an engineering problem rather than a geology problem, and there are more engineers than geologists available to tackle this problem.

Near-term priorities for Michigan:

Michigan can set itself up for long-term success in geologic hydrogen through the following near-term actions:

- **Invest in pre-competitive research:** Some participants suggest the State focus on both collecting new data and retooling existing data. For new data, the State could allocate funding to public research institutions, such as the Michigan Geological Survey, to lead the charge on data collection. For existing data, the State could invest in organizing and analyzing existing geologic data from legacy industries and digitizing existing printed data. This data can then be made publicly available, used to funnel early-movers to build projects in Michigan, and establish Michigan as a national hub for geologic hydrogen.
- **Assemble an industry advisory board:** Some participants thought the State should facilitate collaboration between geologists and industry players to ensure that geologic research and innovation is being conducted in a manner that is most relevant to industry needs. This will help to ensure that research institutions and private sector are steering in the same direction as they jointly build up Michigan's geologic hydrogen industry.
- **Pair geologic hydrogen with other industries:** Michigan's geologic hydrogen industry does not need to be developed in isolation. Some participants thought the State should seek opportunities to pair geologic hydrogen exploration, extraction, and storage activities with other subsurface industries, such as geothermal, carbon capture, utilization, and storage (CCUS) or critical minerals. Participants thought the State should also explore how geologic hydrogen can fit into or build off existing regulatory and permitting frameworks, such as Part 625, Mineral Wells, of Michigan's National Resources Environmental Protection Act (NREPA), 1994 PA 451, for test well and storage permitting or the US Environmental Protection Agency's (EPA) Underground Injection Control (UIC) Class V regulations for storage or stimulated hydrogen.

Act II: Show Me the Money: Leveraging Federal Opportunities

The purpose of this section was to provide guidance on how to make geologic hydrogen advancements under the current Administration and Congress.

Data will de-risk and drive demand.

To de-risk investment in geologic hydrogen and spur more interest from the private sector, investors need more data that shows how geologic hydrogen can be commercially produced across diverse geologic settings. This requires not only conducting geologic surveys across different geographies but also data-sharing amongst geologic hydrogen stakeholders. The US can facilitate data-sharing between start-ups or tap into universities and national laboratories to build a distributed network of geologic hydrogen expertise. Ultimately, the industry needs to demonstrate to investors that geologic hydrogen production pathways are replicable across different regional markets and that the industry is a secure investment with a diversified portfolio. One participant emphasized the importance of not pinning the success of the entire industry on a single company or geologic hydrogen production pathway.

Clear regulations will clear the runway for project deployment.

Establishing clear regulations and permitting processes for geologic hydrogen activities will attract more private capital at a time when federal funding is limited. The industry needs more guidance on topics related to well classification, land leasing, permitting, and even definitions, i.e., what does the government define as stimulated and natural hydrogen. Venture capital, which is likely to play an outsized role in funding early projects, demand expediency and assurance when it comes to building a pilot project. Clear regulations and permitting can give them both. While Michigan is well-positioned to become a national leader in geologic hydrogen due to its subsurface resources, the State can further establish leadership by becoming the first to create clear State-level regulations on geologic hydrogen.

No need to reinvent the wheel.

Although geologic hydrogen is 'new,' that does not mean that the industry needs to start from scratch. Federal policymakers' muscle memory is relatively fresh when it comes to standing up new technologies thanks to federal actions taken over the last decade or so. Congress also prefers to use this muscle memory when it comes to policymaking. Therefore, stakeholders should use existing regulatory frameworks and innovation models as templates for creating geologic hydrogen legislation. Below are some examples of existing federal initiatives, programs, and offices that can be useful for advancing US geologic hydrogen efforts:

Test Bed Models:

- **Carbon Storage Assurance Facility Enterprise (CarbonSAFE) Initiative:** The combination of CarbonSAFE's stage-gated funding mechanism and establishment of test beds across various geologies enables developers in different regions and multiple technology readiness levels (TRLs) to have access to funding. This produces non-proprietary data, promotes a diverse innovation portfolio, and helps avert the risk of hinging an entire industry's success on a single entity.
- **Utah Frontier Observatory for Research in Geothermal Energy (FORGE):** The Utah FORGE model enables multiple developers to have access to federal funding, resources, and expertise at a single test bed. This not only yields cutting-edge research but also enables public-private collaboration in developing industry standards for budding technologies.

Underground Gas Storage:

- **Underground Injection Control (UIC) Program:** The UIC Program regulates a broad range of fluids for subsurface injection and storage. Geologic hydrogen storage wells could either fit into existing injection well classes or the program could create a

new class of wells for geologic hydrogen.

- **Federal Helium System:** The now privately-owned Federal Helium System set the precedent of the federal government successfully managing the long-term storage of small molecules in salt caverns. The lessons learned from this project can be useful for managing geologic hydrogen storage in salt caverns.

Department of Energy Offices (as of December 2025):[2]

- **Office of Fossil Energy (FE)**: Given its similarities to fossil fuel extraction, it would make sense for geologic hydrogen to have a home in FE.
- **Office of Energy Efficiency and Renewable Energy (EERE):** The Hydrogen and Fuel Cell Technologies Office (HFTO) would be a natural fit for geologic hydrogen given it is a hydrogen technology. It also makes sense for geologic hydrogen to fall under EERE given its similarities to geothermal which is managed by the Geothermal Technologies Office (GTO) under EERE.

Nascency and low-cost potential can lead to bipartisan support.

Geologic hydrogen extraction technology is viewed as nascent enough to gain significant political momentum and bipartisan support if framed correctly. Furthermore, geologic hydrogen's potential to provide a low-cost, highly abundant, and domestically produced energy source aligns with the policy goals of both Democrats and Republicans.

Act III: Building a Landscape: Reconfiguring a Hydrogen Economy for Michigan

The purpose of this discussion was to encourage participants to apply their learnings from the previous two acts to identify key end-uses for geologic hydrogen, as well as the near and long-term actions Michigan can take to stand up geologic hydrogen offtake in the State and the broader region. The section closed with a capstone exercise in which participant groups came up with a news story on a groundbreaking geologic hydrogen project in Michigan in 2050. The goal of this activity was to have participants draw upon their learnings from the convening, expertise, imagination, and hopes in order to envision what success looks like for geologic hydrogen in Michigan.

We need more data to accurately predict offtake pathways.

There are too many unknowns when it comes to geologic hydrogen in Michigan to accurately predict all offtake pathways. Factors such as the purity of geologic hydrogen in Michigan's subsurface, locations of natural hydrogen reservoirs, most suitable spots to produce stimulated hydrogen, the environmental impact of extraction, etc., will determine which sectors will be most suitable offtakers for Michigan's geologic hydrogen. These factors will also have broader implications on geologic hydrogen transportation, storage, and co-location of production and offtake. Participants also noted that existing use cases for hydrogen may not be suitable for geologic hydrogen. More data will help to address these uncertainties.

"If it's cheap enough, then private sector will figure out how to use it."

The low-cost, high-supply potential of geologic hydrogen in Michigan may be enough to sway the private sector to make smaller investments in exploration activities without having complete data on extracted hydrogen purity and offtake pathways. As previously mentioned, the biggest

hurdle to private sector investment in geologic hydrogen is lack of geologic survey data. Some participants did not see uncertainties related to purity levels and end-uses as major barriers to private sector participation, but rather engineering and money problems that the private sector would potentially be willing to resolve if geologic hydrogen is proven to be abundant and cheap. One participant also highlighted that the general sentiment from Michigan's big industrial players is "show us the cheap hydrogen, and we will convert to it."

Be prepared, not prescriptive, when it comes to offtake.

While more data is needed to isolate specific offtake pathways for geologic hydrogen, some participants suggested the State still research potential end-use sectors in the meantime. Some participants noted that the State should identify industries where geologic hydrogen remains a high-value proposition regardless of purity levels, such as industrial applications that require high heat and less refinement. Participants also suggested the State prioritize hydrogen applications with low price elasticity to prepare for higher-than-expected prices for geologic hydrogen.

Key Questions Raised:

Related to funding:

- What are the questions that need to be answered to unlock stimulated and natural hydrogen investment?
- What within geologic hydrogen can Michigan channel its funding into?
- How can Michigan pull in private capital in the absence of federal funding in the near-term?

Related to policy support:

- How do we market geologic hydrogen to the public to garner policy and funding support from the State?
- How do we frame geologic hydrogen, and hydrogen more broadly, in a way that's going to have robust bipartisan support?
- How can geologic hydrogen support Michigan's development goals?

Related to purity levels:

- What is the purity of geologic hydrogen in Michigan's subsurface?
- How can low-purity hydrogen be used to address problems we don't have solutions for?
- How can we align varying purity levels of extracted geologic hydrogen with potential offtake pathways?

Related to production:

- Where and how can we produce geologic hydrogen at commercial rates?
- How does Michigan encourage subsurface exploration development?

Related to private sector involvement:

- What will be the first sector to adopt geologic hydrogen as their input?
- How can the State incentivize and facilitate data-sharing between private sector players?

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[1] Serpentinization is the formation of hydrogen through a reaction between water and certain iron-rich rocks. Radiolysis is the formation of hydrogen where natural radiation deep in the Earth breaks down water molecules.

[2] US Department of Energy Organizational Realignment Announcement: https://www.energy.gov/articles/energy-department-announces-organizational-realignment-strengthen-efficiency-and-unleash