

REGIONAL ROUNDTABLE: THE FUTURE OF HYDROGEN IN UTAH

November 2-3, 2021

Overall takeaways

- Hydrogen is not a new fuel, but it's gained recent attention for its role in deep decarbonization. Hydrogen shows particular promise for reducing emissions in hard-to-decarbonize sectors, such as industry and heavy-duty transportation, and for storing electricity generated by intermittent renewable resources.
- Utah is host to several industry-leading hydrogen projects that are already creating jobs in the state. As the private sector continues to make significant investments in hydrogen technology, Utah is positioned to be a national leader in the industry.
- Hydrogen has its challenges, including cost and the potential for greenhouse gas or nitrogen oxides emissions during production and combustion, respectively. The success of efforts to address these challenges will determine the competitiveness of hydrogen in specific use-cases.
- Reliable access to infrastructure is key to giving companies the confidence to invest in hydrogen technology.
- Expanding alternative fueling stations could offer Utah a competitive advantage in attracting clean transport investments to the state, which could also provide air quality benefits.
- While demand for hydrogen is increasing, more needs to be done to grow the market and cultivate a dedicated user base for various hydrogen technologies. Public-private partnerships that bring together government and companies across the hydrogen supply chain can help ensure coordinated investments, grow demand, and streamline planning.
- Utah has already integrated hydrogen into the state's energy code and planning approaches, however, creating a regulatory framework for hydrogen could help define "rules of the road" for companies engaged in hydrogen businesses in Utah.

Session 1: Exploring hydrogen's potential and barriers in Utah

- Utah is already acting as a proving ground for innovative hydrogen concepts, including hydrogen storage in salt caverns, hydrogen blending in natural gas lines, and the conversion of a coal plant for green hydrogen production and fueling. These first-mover projects and others can help establish Utah as a leader in the industry.
- Utah is well-positioned to play a key role in the hydrogen industry, with its location at the crossroads of the western United States, history of energy production, skilled energy workforce, renewable energy potential, and favorable business environment.
- While hydrogen has potential in multiple sectors, questions remain about its cost benefits compared to low-carbon alternatives such as renewable natural gas, batteries, etc. In certain low- and zero-carbon applications, non-hydrogen options will be more cost competitive.
- Further, more needs to be done to drive down the cost of hydrogen so it can be an economical alternative to conventional fossil fuels. Large-scale projects in Utah and elsewhere, coupled with research and policy investments, can create economies of scale and foster breakthroughs to achieve cost parity with alternatives.
- While Utah has a growing supply of hydrogen, it will be critical to generate in-state demand to realize the full range of hydrogen's potential economic, climate and health benefits.

- Some hydrogen production pathways and uses can be emissions intensive, including not only greenhouse gases, but other pollutants like nitrogen oxides (NO_x) which can be created when hydrogen is burned. More research and design innovations are needed to limit these emissions and reduce the air quality impacts of hydrogen in various applications.
- There are multiple pathways for producing hydrogen, including steam methane reformation, with or without carbon capture, and electrolysis. There are many potential feedstocks for hydrogen production, such as natural gas, methane from landfills or anaerobic digesters, renewable energy, and wastewater. Each pathway has its advantages and its challenges in Utah.
- A clearer lexicon for hydrogen types that differentiates based on the attributes of the hydrogen (e.g., “methane converted hydrogen” or “renewable hydrogen”) could help drive consumer awareness and reduce confusion created by the current spectrum of hydrogen “colors.”
- Compared to other energy sources, hydrogen lacks a state regulatory framework to govern its production, recovery, transport, and use. Strategic planning could also help Utah consider how hydrogen might be integrated into the state’s energy system, such as using excess renewable capacity or flare gas to support hydrogen production.
- The production of green hydrogen via electrolysis can raise concerns about water availability. In certain cases, green hydrogen production can use less water than traditional fossil energy sources, but efforts are still needed to explore appropriate green hydrogen production pathways for Utah, such as using non-potable or wastewater as feedstocks.

Session 2: Infrastructure and the hydrogen opportunity

- Utah possesses a range of existing infrastructure that can be leveraged for hydrogen production, delivery, and use, including renewable energy projects, regional transmission lines, flare gas sites, natural gas pipelines, salt caverns, rail lines, trucking corridors, and ports.
- The hydrogen industry faces a chicken-and-egg infrastructure challenge: companies want to see refueling infrastructure in place before adopting hydrogen technologies, but infrastructure investors also need assurances about future user demand. Establishing hydrogen infrastructure could give potential buyers confidence to invest in hydrogen solutions.
- Partnerships between government agencies and the private sector can help facilitate investments in hydrogen infrastructure. These partnerships can also foster demand for hydrogen by bringing together actors from across the supply chain, including producers, equipment manufacturers, and end users.
- Utah’s status as a logistics hub makes it uniquely positioned to build out hydrogen trucking infrastructure along key cargo corridors. As fleets move toward cleaner fuels, their investment decisions will be determined in part by the presence of alternative fueling corridors, already being expanded in the West. Investments in such corridors could have significant air quality benefits for the state.
- Although multiple industries are working on hydrogen technology in Utah (such as train manufacturers, truck manufacturers, and others), they often do not communicate. Promoting learning exchanges between these actors can help break down industry silos and advance hydrogen investments in the state.
- Some types of infrastructure, such as natural gas pipelines, can accommodate hydrogen and natural gas blending, but will need to be retrofitted (or replaced completely) for higher concentrations, which could prove costly.
- Procurement partnerships among consumers, such as commercial and municipal fleet operators, can help reduce costs and scale demand to precipitate infrastructure build-out.