

**HOUSE COMMITTEE ON SCIENCE, TECHNOLOGY AND SPACE,
SUBCOMMITTEE ON ENERGY**

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This committee's focus on clean hydrogen is appropriate and timely. Clean hydrogen - made from inexpensive renewable electricity - is a game-changing technology that will reduce the cost and increase the pace of our domestic industry's Energy Transition to decarbonization. We are at a key moment in our industrial history where deep decarbonization is enabled by the historic affordability and availability of renewable energy. This intersection of cost-effective, abundant clean power is beginning to unlock the long-awaited potential of clean hydrogen.

This is an enormous opportunity for our nation as long as we seize it. Congress and federal agencies will help determine whether we do.

America has the most powerful economy due to our historical ability to dream big, invent, innovate, deploy, and deliver on the vision of earlier generations. The Energy Transition is already a globally competitive sprint, yet we risk being out-paced out of the blocks. It should be acknowledged that we are often holding ourselves back, as we can't seem to define a common vision. Our economy is stuck focusing only on things that scale rapidly like apps and software-- while ignoring infrastructure, which we know yields more jobs and opportunities for the middle class and pays dividends for many generations.

Make no mistake, clean hydrogen is an enormous infrastructure opportunity for this country.

Unlike previous generations that out-built our competitors and adversaries during the industrial revolution, both world wars, and the cold war, we're lagging behind because we have forgotten how to dream in steel.

I don't want to overstate the challenge in front of us. To fully decarbonize, we do not need to reconstruct every part of our economy. However, we do need to readjust and apply advancements in engineering across our economy so it can run on inexpensive clean power. We need to build, innovate, and adapt, just as previous generations did to address the looming challenges of their times. Converting to electric power sources from combustion sources is a critical step, but electrification alone will not decarbonize many heavy-duty carbon-intensive sectors of our economy, like shipping and steel production. This is why clean hydrogen is so critical.

Clean hydrogen is also an important bridge between the rapidly expanding renewable energy industry and the incumbent fossil energy industry - giving local economies that depend on the fossil fuel industry and businesses in urban and rural America, a starring role to play and an ownership stake in the Energy Transition.

Several rural regions of the United States hold enormous potential for clean hydrogen particularly Texas and Oklahoma. These States have abundant wind and solar generation potential, a vast network of pipeline infrastructure, and a ready workforce, and I believe are poised to become the Saudi Arabia of Clean Hydrogen.

Let me be clear this is not the same hydrogen opportunity we were talking about in the mid 2000's. Current forecasts from Bloomberg New Energy Finance identify that the cost of producing clean hydrogen, driven by low cost, high-capacity factor renewable energy, will reduce by over half by 2030¹. The DOE's own Hydrogen Earthshot initiative aligns with this objective of low-cost clean Hydrogen in the next decade. This federal focus on cost is important, but in addition to electrolyzer manufacturing advances, the key to this cost-reduction initiative will be rapid deployment. We've already seen this with solar and wind. We're seeing it now with batteries. The electrolyzer technology that produces clean hydrogen can -- and should -- be next.

The tremendous research investments of the past have already given us many of the tools we need to begin building a clean hydrogen industry in this country. I believe what is missing are the pilot demonstrations needed to help generate scale.

To showcase the importance of successfully scaling clean hydrogen, look no further than the solar industry. The US Energy Information Administration's 2021 Reference Case² concludes that over two-thirds of the net electric sector development between now and 2050 will be renewable power, with the vast majority of that being solar. This solar dominance is because of the inexpensiveness of the electricity it can generate. With zero carbon electricity at costs below that of the most efficient natural gas plants, it becomes inevitable that clean electricity will be used to drive the zero and negative carbon industries we need to decarbonize. These industries include clean hydrogen and e-fuels, carbon capture, electrification of industrial thermal loads and mass EV charging.

Put simply, the rapid scaling of the solar industry is giving birth to the clean hydrogen industry, providing two incredibly valuable economic opportunities for American industrial leadership.

As one of the leading American developers of clean energy, my company is regularly in conversations with natural gas pipeline companies, local distribution companies, and end-users -- and they all want lower carbon fuels. Demand for carbon emission reductions through voluntary corporate commitments sets up a unique opportunity for the Department of Energy (DOE) to connect demand with interest in providing supply. DOE can play this critical role to put hydrogen into pipelines through innovative pilots at scale with appropriate grant funding and coordination with other DOE programs. This targeted approach can begin to build the bridge between clean energy and incumbent fossil energy technology.

¹ BNEF, April 2021

² EIA Annual Energy Outlook 2021

Hydrogen's versatility presents many opportunities; however I acknowledge that all these opportunities could make it challenging for DOE to decide where to most efficiently focus resources. Federal demonstrations will be essential and should be focused on opportunities that support and incentivize rapid, large-scale private investment. I strongly support the Infrastructure Bill's direction to DOE to establish a number of clean hydrogen hubs nationwide. I understand that a variety of criteria will determine where these hubs will be located, but the opportunity to accelerate deployment should be prioritized. I offer these three specific methods.

First, ensuring that DOE's hydrogen hubs encourage demonstration facilities integrated into existing industrial processes is low hanging fruit. Decarbonizing today's consumers of hydrogen -- primarily in refining and ammonia production -- is one of the best use-cases for hydrogen as a decarbonization lever. These facilities will eventually require GWs of electrolyzers, but while that scale presents a tremendous long-term opportunity, the large-scale nature presents near-term challenges. The immediate focus should be on large demonstrations in the hundreds of MWs to support the industry's transition.

Second, blending clean hydrogen into the natural gas pipeline system will leverage the billions of private industry dollars that have already been invested. Joint public-private initiatives like DOE's HyBlend effort are important but need to be expedited and expanded beyond public cost-benefit tools. That program is also projected to conclude in 2023. To avoid falling further behind, I would urge that it be succeeded by a goal of 1 million kilograms of clean hydrogen injected into natural gas pipelines daily by 2027. Pilots should start by safely testing and validating hydrogen blending limits in hydrogen hub regions. The efforts could start off at low-level blending at 5-10% and increase over time. This work will be critical to providing the regulatory certainty for pipeline companies and asset developers to deploy private capital. By focusing here, I'm confident this will position the US as a hydrogen leader by the end of the decade.

Finally, this emerging industry also needs clear and defensible carbon accounting guidance across all of these demonstrations. The DOE should prepare a consistent and scientific approach that gives the voluntary market participants confidence that a defensible method for calculating emission reductions exists that they can hold the private sector to. With this in place, the right market signals will exist to offer voluntary markets new options to decarbonize. This approach should consider the carbon impact of the full fuel lifecycle, including onsite emissions from hydrogen generation as well as upstream feedstock production.

In conclusion, DOE, with the backing of Congress, holds several keys to unlocking clean hydrogen's potential here at home. The United States can and should pioneer the development of this exciting industry which will play a key role in saving the planet. If we don't, we'll be leaving jobs, rural economic investment, and global climate leadership on the table. I've been in the energy industry long enough to see that change is occurring - the Energy Transition is well underway. But to accomplish our goals for a lower carbon future, we need to speed up the transition - as efficiently, economically, and justly as possible.