

Federal and state policies poised to propel green hydrogen investment in the US

Blog post by Advisor Stephanie Grumet, 10 February 2022

Private financing of green hydrogen projects is likely to gain traction in the US, galvanised by billions in federal funding forthcoming from the Infrastructure Investment and Jobs Act (IIJA), a infrastructure bill passed in the US Congress last year. The IIJA authorised \$8 bn in grants to foster hydrogen hubs, accelerating both production and end-use applications that can help fill the technological gaps in achieving net-zero carbon emissions. US state policies that price carbon and allow regulated utilities to produce and distribute hydrogen are proliferating, sending positive price support signals for green hydrogen. Passage of a green hydrogen production tax credit, which we view as possible, would future solidify the investment outlook.

Background

Hydrogen production is not new: the US produces about 11m tons of hydrogen per year currently through steam reforming using methane. Green hydrogen splashed onto the scene more recently as a way to accelerate decarbonisation through the storage of energy in chemical bonds when hydrogen is produced using zero-carbon generation sources, like renewable and nuclear generation. Hydrogen in turn can be used to generate electricity, power vehicles through fuel cells, heat homes, and power industrial processes. Because it is so light - think back to the periodic table, where hydrogen sits in first position - hydrogen has a high energy content per unit of weight. Since there are no carbon atoms in hydrogen, its combustion is free of carbon dioxide.

\$8 Billion for US Hydrogen Hubs

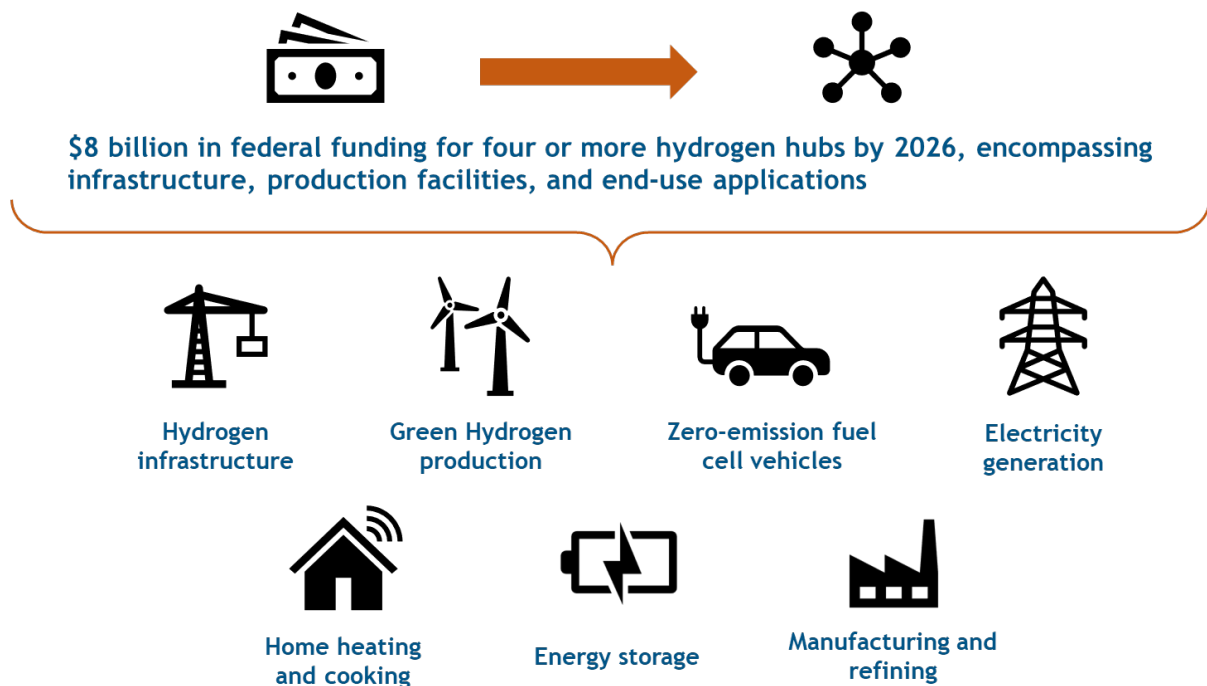
The IIJA, passed in November 2021, authorised \$8 bn to accelerate the production and use of hydrogen up and down the value chain. The statute requires the Department of Energy (DOE) to distribute these funds across at least four hydrogen hubs between 2022 and 2026. All signs are that this will not be a typical protracted government process bogged down by bureaucracy. DOE must solicit proposals by May 15th, 2022, and complete awards by the following May 15th, 2023.

Hydrogen Hubs are defined by the IIJA as “a network of clean hydrogen producers, potential clean hydrogen consumers, and connective infrastructure located in close proximity.” These hubs are supposed to be soup to nuts, supporting both hydrogen production as well as end-use applications. Hydrogen production can be from fossil (with emissions capture), nuclear or renewable energy. The desired intent is for these hubs to grow and become interconnected, thereby seeding and germinating investments to enable a broad use of hydrogen in the economy. While the IIJA specifies ‘at least four’ hydrogen hubs, DOE is not constrained to this number and could and likely will choose to fund more, spreading the wealth across important political constituencies.

The Natural Gas/Hydrogen Interplay

In the IIJA, Congress specified: “To the maximum extent practicable, at least two regional clean hydrogen hubs shall be located in the regions of the United States with the greatest natural gas resources.” The two largest natural gas producing states in the US are far and away Texas (24%) and Pennsylvania (21%), trailed by Louisiana (10%), Oklahoma (8%) and West Virginia (7%). Our read of the statute is that it does not really constrain DOE but still, it is no accident Congress is driving for synergies between natural gas and hydrogen.

Hydrogen can be combined with natural gas in most applications and will reduce emissions because combusting hydrogen has no carbon by-product. Natural gas turbines can already burn about 30% hydrogen for electricity production - pilot projects are underway in Florida and Ohio. Mitsubishi and GE are working on turbines that can be fuelled exclusively with hydrogen. Hydrogen can likewise be used in natural gas utility services, like home heating and cooking up to a certain percentage (10-20%) depending on the local infrastructure. Yet some pipeline embrittlement and degradation can occur with increasing amounts of hydrogen, so infrastructure upgrades may be required. We believe DOE’s grants will be instrumental in advancing private hydrogen investments, which could be particularly potent in areas with strong state climate policies.



Washington State at the vanguard of US hydrogen policy

There is a long list of game-changing climate policy coming out of Washington state. The Climate Commitment Act (CCA), passed in 2021, establishes an economy wide cap-and-trade program to limit and reduce greenhouse gas emissions (GHG). The CCA, in addition to state policies allowing utilities to recoup costs associated with hydrogen investments, are well designed to attract financing.

The CCA requires natural gas utilities, responsible for 13% of the state's baseline GHG emissions, to participate in its cap-and-trade program. The slope of required emission reductions is steep: 45% below 1990 levels by 2030, 70% below 1990 levels by 2040, 90% below 1990 by and net-zero by 2050. Enforcement starts in January 2023. Natural gas utilities are likely to explore the use of blending hydrogen to help achieve these goals. Utilities are motivated to demonstrate emissions reductions since municipalities in the state, like Seattle, are banning natural gas connections for new multistorey and multifamily residential buildings.

In 2019 Washington passed SB 5588, allowing power utility districts (PUD) to recoup costs associated with hydrogen production and distribution. A 5mw pilot project at the Douglas County PUD is already underway to generate hydrogen using off-peak hydroelectric power. Based on our recent conversations with policy contacts, all of the projected hydrogen already has offtake contracts. An extension of this provision to municipalities, embodied in HB 1792, passed out of subcommittee in January.

[More is More](#)

Our base case remains that Congress will pass some form of energy tax credits in 2022 that include a production tax credit for hydrogen in the range of \$3 per kilogram. Such a move would meaningfully improve the economics of hydrogen production. In addition to the \$8 bn for hydrogen hubs, IJJA authorized \$1 bn for hydrogen electrolysis and \$500m for hydrogen-based manufacturing innovations -- in addition to the \$52.5m Hydrogen Energy Earth Shot announced in July 2021. Other States, like Oregon and New York, are joining Washington in crafting hydrogen-friendly policies. Adding to federal and state level policy triggers is the increasing need for portfolio companies and pension funds to demonstrate high environmental, social and governance (ESG) performance. Hydrogen investments can help fund performance amid the growing pool of climate-conscious investors.