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# Green Energy 2020: Hydrogen the Future Fuel? A Review of the Technical Challenges in Replacing Natural Gas with Hydrogen for Heating, UK- Abhishek Asthana- Sheffield Hallam University

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**Introduction**

Hydrogen is being seen as a key future for reducing our carbon emissions and governments are seriously considering repurposing existing gas networks to pure hydrogen so that it can be used by industry, in homes and businesses, and in the energy sector. However, unlike other energy vectors such as electricity, hydrocarbon gases and district heating, high-purity hydrogen has not been deployed at large scales anywhere in the world. This puts hydrogen at a distinct disadvantage. Any attempt to replace natural gas with hydrogen will require a compelling case to compensate for this lack of experience.
This article explores the importance of natural gas to our energy systems and the benefits of hydrogen, which could significantly decarbonise our heating and reduce over-dependency on natural gas. These include: (i) Hydrogen can use much of the existing gas infrastructure, (ii) Hydrogen is a very versatile fuel which can be used by households, industry and businesses (iii) Hydrogen can be produced in large volumes (iv) Hydrogen compares well with other low-carbon heat technologies. This paper considers a number of key questions which need to be addressed before attempting any large-scale deployment of hydrogen to retrofit homes and businesses.
Hydrogen can be separated from non-renewable energy sources and biomass, from water, or from a blend of both. Petroleum gas is right now the essential wellspring of hydrogen creation, representing around seventy five percent of the yearly worldwide devoted hydrogen creation of around 70 million tons. This records for about 6% of worldwide petroleum gas use. Gas is trailed by coal, because of its predominant job in China, and a little portion is created from the utilization of oil and power. The creation cost of hydrogen from petroleum gas is impacted by a scope of specialized and financial variables, with gas costs and capital uses being the two generally significant.

Fuel costs are the biggest cost segment, representing somewhere in the range of 45% and 75% of creation costs. Low gas costs in the Middle East, Russia and North America offer ascent to probably the least hydrogen creation costs. Gas merchants like Japan, Korea, China and India need to battle with higher gas import costs, and that makes for higher hydrogen creation costs.

Hydrogen use today is ruled by industry, to be specific: oil refining, smelling salts creation, methanol creation and steel creation. For all intents and purposes the entirety of this hydrogen is provided utilizing petroleum products, so there is critical potential for discharges decreases from clean hydrogen.

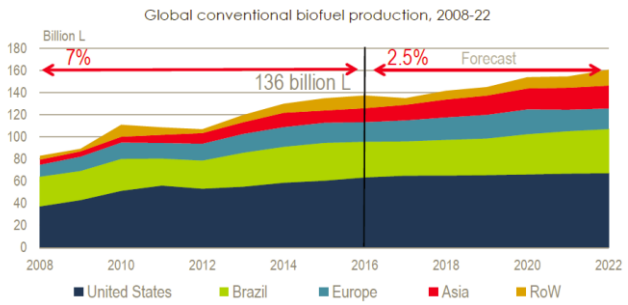
In transport, the intensity of hydrogen power device vehicles relies upon energy unit expenses and refueling stations while for trucks the need is to decrease the conveyed cost of hydrogen. Delivery and flying have constrained low-carbon fuel alternatives accessible and speak to an open door for hydrogen-based powers.

Hydrogen is as of now broadly utilized in certain enterprises, yet it has not yet understood its capability to help clean vitality changes. Goal-oriented, directed and close term activity is expected to additionally conquer hindrances and decrease costs.

The IEA has distinguished four worth chains that offer springboard chances to scale up hydrogen gracefully and request, expanding on existing businesses, foundation and approaches. Governments and different partners will have the option to distinguish which of these offer the most close term potential in their geological, mechanical and vitality framework settings.

Notwithstanding which of these four key open doors are sought after – or other worth chains not recorded here – the full arrangement bundle of five activity territories recorded above will be required. Moreover, governments – at provincial, national or network levels – will profit by universal collaboration with other people who are attempting to drive forward comparable markets for hydrogen.

**Image:**

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