

Natural Hydrogen: Promising opportunities for Exploration & Production

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1 Introduction

The global energy sector is transforming and hydrogen (the most energy-rich gas) is likely to play an increasingly prominent role as a clean energy carrier. Many countries have identified hydrogen as a key pathway to decarbonise their transport, industry processes, heating and energy storage sectors.

Hydrogen is almost exclusively manufactured for industrial use, with around 840 Bm³ per year being produced worldwide (Wood Mackenzie 2021).

It can be produced artificially via a variety of different pathways and the primary methods for production of hydrogen with low carbon emissions being

1. water electrolysis using renewable energy (green hydrogen)
2. steam reformation of natural gas paired with carbon capture and storage (CCS; blue hydrogen)
3. coal gasification combined with CCS (also blue hydrogen).

Note:

- the majority of produced hydrogen originates from hydrocarbon-based feedstock without CCS (grey hydrogen) since the economics for the electrolytic production of green hydrogen (0.1% of total H_2 production) requires improvement (Wood Mackenzie 2021).
- For a large-scale hydrogen industry to develop, hydrogen storage is key and hydrogen storage in salt caverns is considered the most promising approach for large-scale seasonal storage (HyUnder 2013; Caglayan et al. 2020).

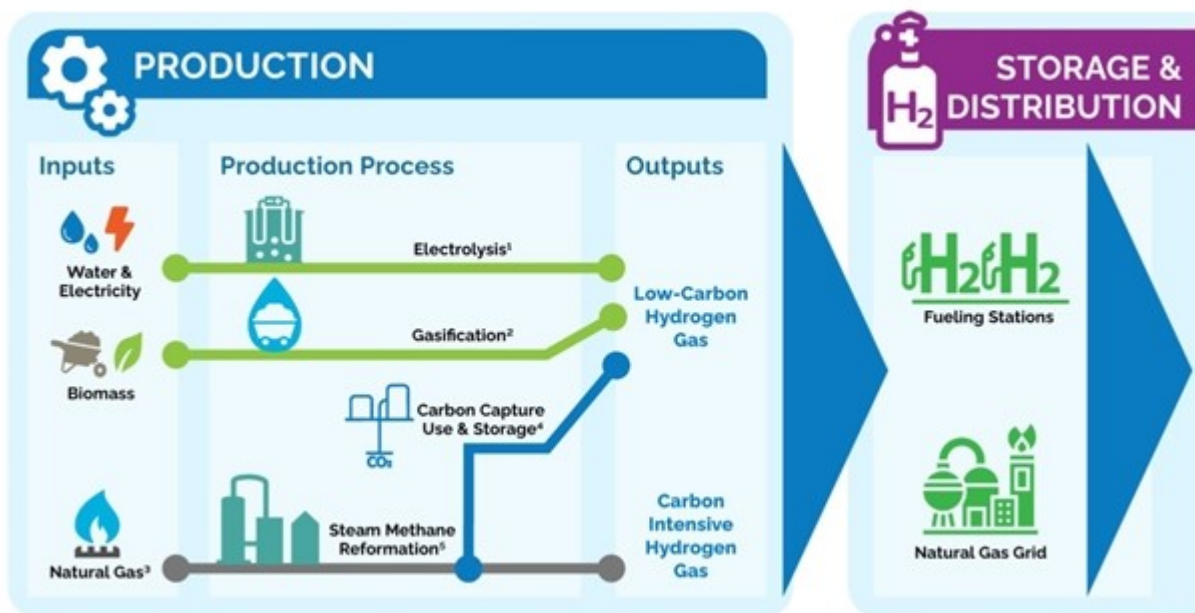


Figure 1 *Primary methods for hydrogen production*

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