

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 H₂ 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).

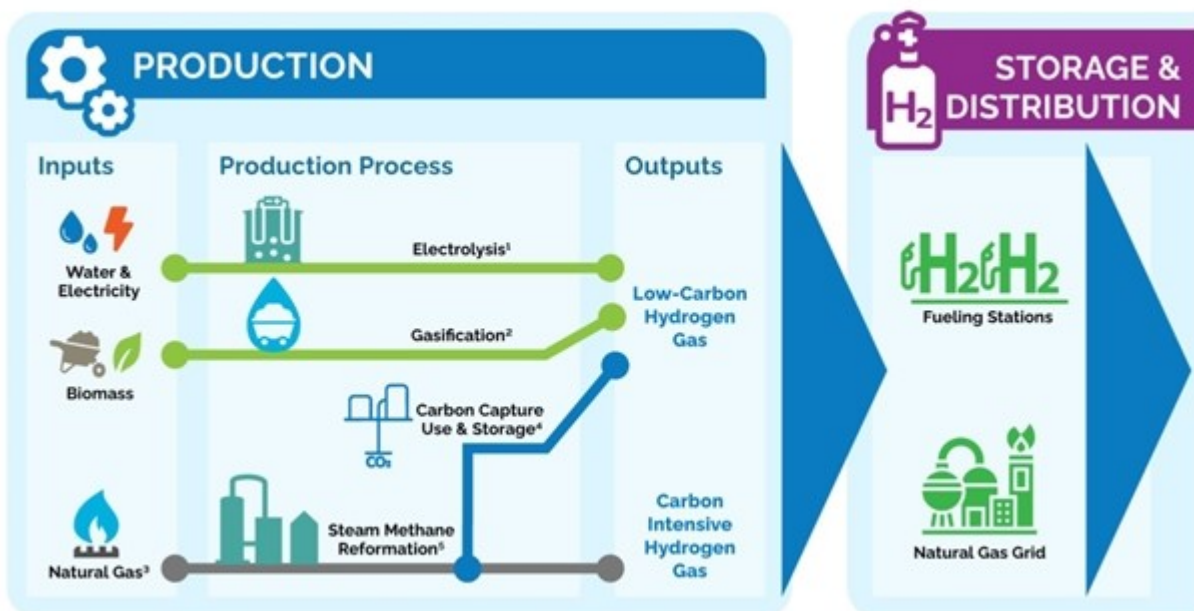


Figure 1 Primary methods for hydrogen production

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