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The Hydrogen 4 EU study was published in May 2021. Based on modelling carried out by the partners, IFPEN, SINTEF and Deloitte, the project aims to map out pathways exploring the role of hydrogen in a decarbonized European energy system.

## Hydrogen 4 EU: two scenarios in which hydrogen serves "zero emissions"

The study looks at two policy scenarios – a renewable scenario and a technology diversity scenario – charting pathways for hydrogen to contribute to the EU's goal of net zero emissions by 2050. Based on actual European targets and using transparent modeling frameworks, **it examines the technology mix, the cost of the transition and the risks associated with various policy choices**. It finds that the contribution of hydrogen to decarbonising the EU's energy system can well exceed EU projections, with demand exceeding 100 million tonnes of H<sub>2</sub> by 2050. Low-carbon hydrogen plays an essential role in supporting the deployment of renewable hydrogen and integration of higher volumes of renewable energy. In both scenarios, renewable hydrogen scales up rapidly after 2030, however a technology mix incorporating renewable hydrogen production and decarbonized hydrogen production enables a lower-cost and more effective pathway to net zero.

## The main outcomes of the study

According to the study, [the detailed results of which can be found on a dedicated website](#), hydrogen technologies will play an essential role in reaching the Green Deal's 2050 net zero targets by decarbonizing hard-to-abate sectors by addressing gaps left by other decarbonization solutions such as efficiency and electrification and by supporting renewable integration. Hydrogen 4 EU further reveals that total hydrogen demand in 2030 could increase up to three times higher than the EU's Hydrogen Strategy projections.

**Points to remember:**

- More than half of total gross final energy consumption is supplied by non-electrified technologies in 2050, such as low-carbon hydrogen and biomass.
- Hydrogen is essential to get the EU to net zero, particularly where electrification and efficiency gains are challenging.
- Hydrogen can unlock decarbonization of hard-to-abate sectors such as transport – where demand exceeds 50 Mt H<sub>2</sub> in 2050 – and the steel and chemical industries, with a demand of 45 Mt H<sub>2</sub>.
- Renewable and low-carbon hydrogen are both needed for net zero, with natural gas and CCS remaining essential even with higher renewable ambition.
- A stronger renewable push requires infrastructure and value chain investments and represents a total system cost of an additional 70 billion per year compared to a technology diversity scenario.

**Find out more:** : <https://www.hydrogen4eu.com/>

IFPEN is also involved in the production, storage, transport and various energy uses of low-carbon hydrogen.

## YOU MAY ALSO BE INTERESTED IN

[En savoir plus sur l'hydrogène](#)

[Captage-Stockage-Valorisation du CO<sub>2</sub> : un levier pour décarboner l'industrie - La synthèse](#)

Hydrogen4EU : an IFPEN model to explore the role of hydrogen in the European green deal  
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Link to the web page :