

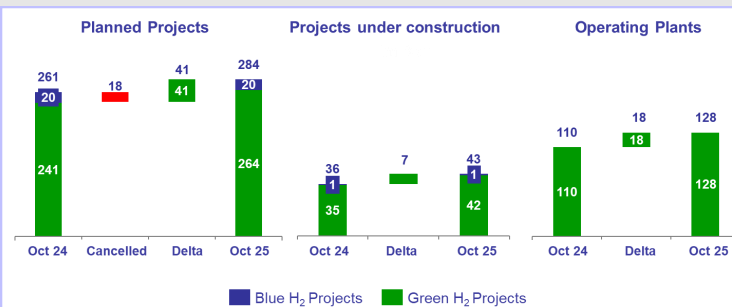
H₂ MARKET RADAR

21.10.2025

KEY FACTS

- In Northwest Europe, 128 electrolysis plants with a combined capacity of 503 MW_{el} are now in operation. A further 327 projects are in the planning stages (28.5 GW_{el}) or are already under construction (867 MW_{el}).
- Underground hydrogen storages will have an important role in the future. The majority of research and commercial projects are located in Europe.
- The production costs of green hydrogen in 2030 will significantly vary globally, depending on the location of production.
- Many hydrogen projects are being reassessed, leading to cancellations in some cases. Reasons include, e.g., a declining willingness to take risks on the part of large corporations and difficulties in the conclusion of long-term purchase contracts.

Development of H₂ projects in Northwest Europe (BE, GER, DK, NOR, NL, UK)

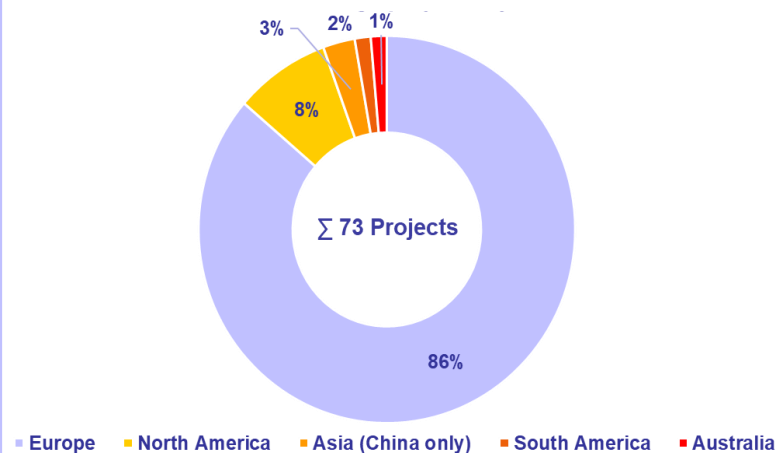


Source: Team Consult Hydrogen Database

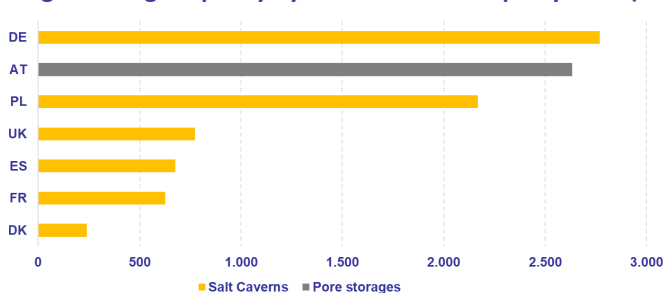
- There are currently 128 plants with a capacity of 503 MW_{el} in operation. Since October 2024, 18 new plants have commenced operation.
- During the same period, 18 projects publicly announced that they would be discontinued. There are numerous reasons for this (see page 2).
- Projects for the production of green hydrogen are dominating (compared to blue H₂) with regard to projects announcements and implementations.

Projects for the development of underground storages for hydrogen

Share of hydrogen storage projects by continent



Hydrogen storage capacity by formation in Europe by 2030 (GWh)

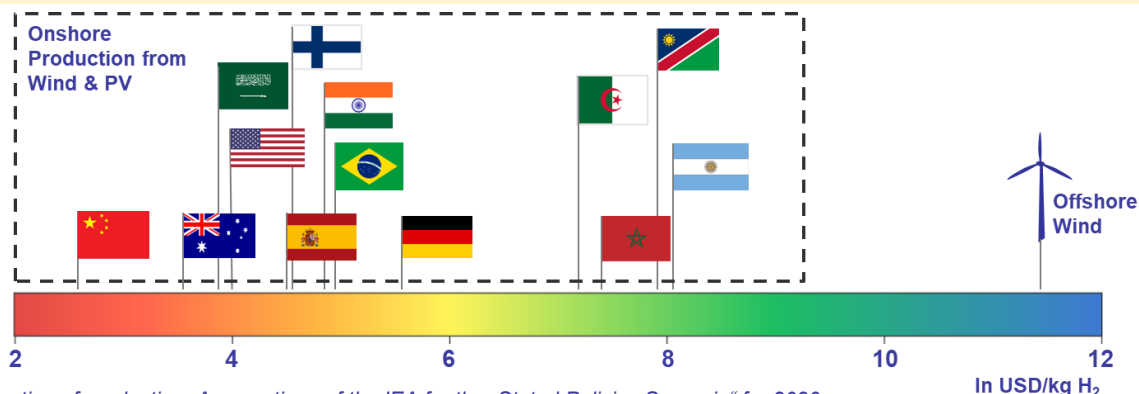


Source: IEA (2025): Hydrogen Infrastructure Database, Team Consult analysis

- Hydrogen storages will be important assets in the future, storing hydrogen during periods of high solar and wind power production and feeding it back to the grid during periods of low production and high demand. They also guarantee a continuous supply to the industry, thereby supporting decarbonisation efforts.
- Salt caverns, rock caverns and pore storages are generally considered as storage formations. An evaluation of the current IEA database on hydrogen storage projects shows that 73 projects for use in the energy system are pursued worldwide in various project stages. The activities focus on research and subsequent use of salt caverns.
- Europe is at the focus of development activities, with 86% of projects being pursued here. Within Europe, activities are concentrated in Germany, Austria, Poland, the UK and France.
- Of these 73 projects, 15 are dedicated to technological research, while 58 are aimed at commercial storage. Based on the projects announced to date, hydrogen storage capacities of up to 10 TWh could be operational in Europe by 2030.
- However, as of today only the RWE Gas Storage West project in Gronau Epe has taken FID and will be operational by 2028.

Green hydrogen production costs in 2030 by country*

- A recent analysis by the IEA of green hydrogen production costs for 2030 shows an enormous global range in these costs (see figure)



*Costs at location of production. Assumptions of the IEA for the „Stated Policies Scenario“ for 2030:

CAPEX for the renewable energy sources used: PV 400-1,250 USD/kW, Onshore Wind 950-2,300 USD/kW, Offshore Wind 1,720-4,850 USD/kW

CAPEX for electrolyzers: 675 USD/kW in China and 1.600 USD/kW for the rest of the world

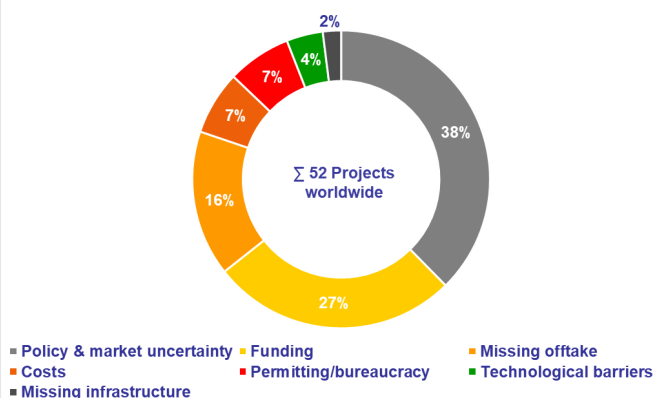
Cost of capital 6% to 20%, depending on production location (country or region); water costs not included

Source: IEA Hydrogen Review 2025 & Team Consult analysis

- The decisive factors for the differences are regional conditions for wind and solar radiation, and the resulting full-load hours of renewable electricity generation from PV and wind. Offshore production is significantly more expensive than onshore production due to the considerable higher specific CAPEX for offshore wind installations.
- Another important factor is the interest rate which significantly affects capital costs. In combination with regionally varying CAPEX, this is the reason why from the IEA's perspective, production costs in southern Europe will be lower than those in North Africa. China's cost advantage can be explained by the assumption that in China CAPEX for electrolyzers will be 675 USD/kW in 2030, compared to 1,600 USD/kW in the rest of the world.

Challenges for hydrogen projects

Reasons for project cancellations*



*Evaluation of project cancellations over the past 18 months

Source: Hydrogen Council: Global Hydrogen Compass 2025

- The momentum behind hydrogen projects has slowed considerably over the past year and a half. After the initial euphoria around five years ago, realism has now set in. In addition to further announcements, there have also been an increasing number of project cancellations recently, leading to a shake-up of the project landscape. It is becoming apparent that, in addition to financial support for projects, long-term purchase agreements with guaranteed volumes and revenues are also of great importance for successful implementation.
- Successful examples include large-scale projects that have a direct link to consumption, such as BASF's 54 MW_{el} project in Ludwigshafen, which is replacing grey hydrogen at the site, or European Energy's Kasso Power-to-X project in Denmark, which has secured long-term purchase agreements for the e-methanol produced.

- There are numerous reasons for project cancellations, as a recent evaluation by the Hydrogen Council shows (see figure). In March, for example, BP withdrew from the large-scale H₂-Fifty project (250 MW_{el}), citing economic conditions as the reason. This is a sign that even large oil companies are less willing to take risks in a changing market environment. In addition, demanding requirements for renewable electricity (RED III) are hampering the realisation of green H₂ projects in Europe.
- In addition to large-scale projects, several small projects have also been cancelled. Investors have withdrawn from such projects, with difficulties in financing and in concluding supply contracts as well as insufficient funding playing a major role.

Imprint

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