

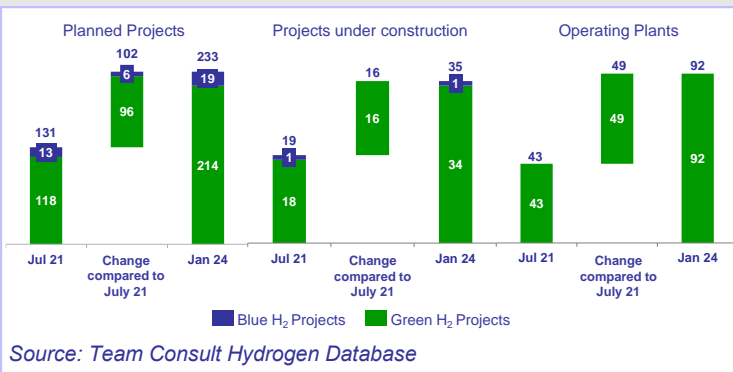
H₂ MARKET RADAR

12.02.2024

KEY FACTS

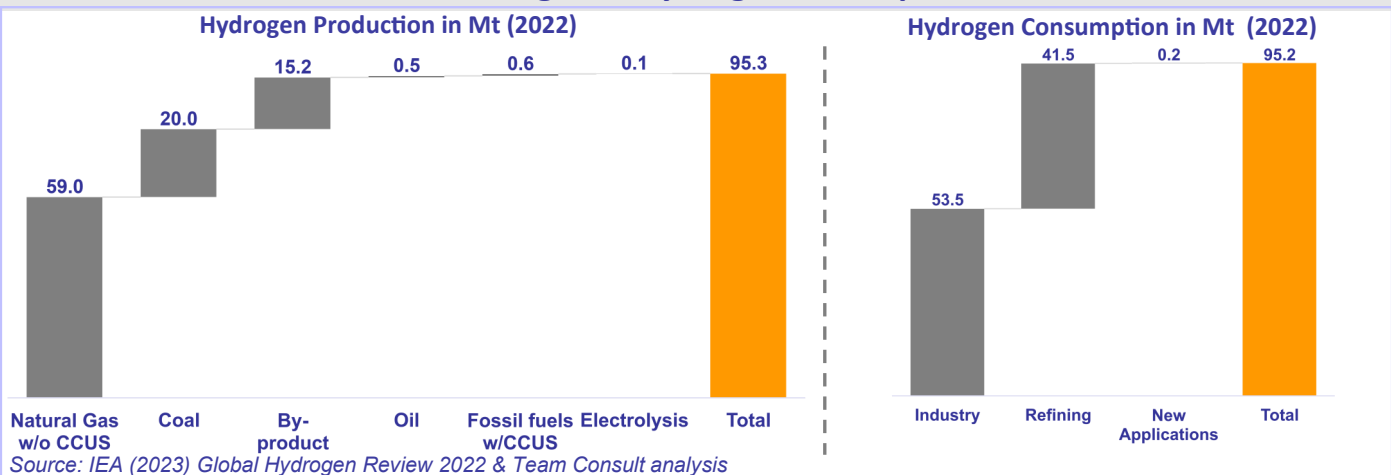
- 92 facilities with a combined capacity of 125 MWe¹ are now in operation in Northwest Europe. In addition, over 260 projects for the production of hydrogen are currently pursued in the region.
- According to the IEA, global H₂-consumption reached 95 Mt in 2022. Most of the H₂ was consumed in traditional sectors such as industry or refining. Consumption in new applications such as fuel or high-temperature heating is still in its infancy.
- The pipeline of projects could increase low carbon hydrogen production capacity to 90 Mt/a under the optimistic assumption that all projects will be realized. Capacities currently planned for the MENA region will not suffice to fulfil European import needs.

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



- 92 green hydrogen facilities with a combined capacity of 125 MWe¹ are now in operation.
- Our database currently contains more than 260 projects in Northwest Europe for the production of green or blue hydrogen indicating continued activity in the sector.
- Over 90% of these projects will be used to produce green hydrogen. Some projects are pursuing the production of green methane or the research of green methanol and e-fuels production.

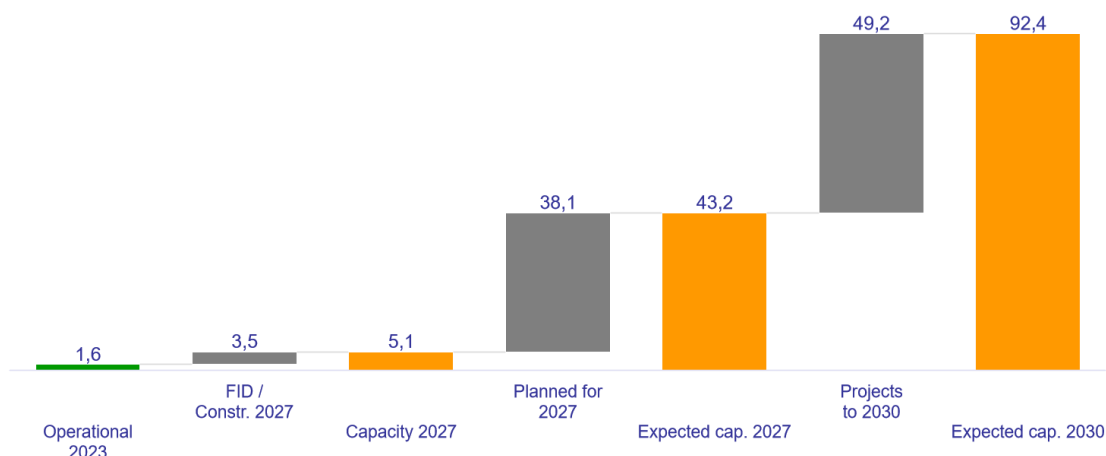
Review of global hydrogen developments



- Global hydrogen consumption reached about 95 million tonnes (Mt H₂) in 2022 according to figures presented by the IEA¹. Most of this consumption occurred in the chemicals and refining sectors. Consumption in new applications such as fuel in transport, electricity storage or high-temperature heating in industry is in its infancy. Almost two thirds of the hydrogen consumed is still produced from unabated natural gas, followed by coal and as a byproduct of refining activities.
- The production of blue hydrogen (from fossil fuels with CCUS) amounted to less than 1 Mt in 2022. The production of low carbon hydrogen is currently dominated by Canada and the United States. Green hydrogen based on electrolysis and renewable energies amounted to less than 0.1 Mt of hydrogen.
- An evaluation of the current version of the IEA Hydrogen Production Database shows that operational electrolysis capacities in 2023 amounted to roughly 1 GW. When taking blue carbon hydrogen projects into account this figure rises to 1.6 GW. The roughly 200 projects which have taken FID or are currently under construction globally could result in a production of about 5 Mt low-carbon hydrogen per year by 2027. Low carbon hydrogen would thus still play only a niche role in global hydrogen supply (see following figure).

¹ IEA (2023): Global Hydrogen Review 2022

Development of global low carbon H₂ production capacity in Mt/a *

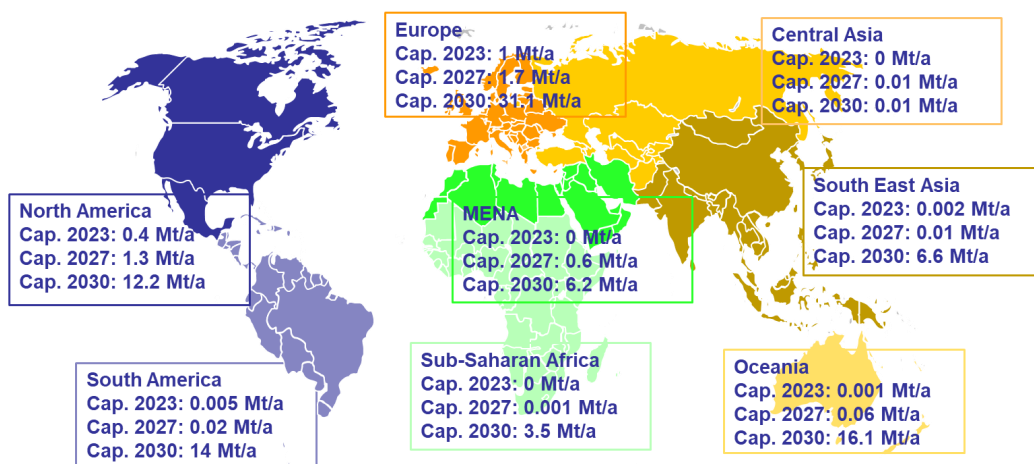


Source: IEA Hydrogen Database 2023 & Team Consult analysis

* includes hydrogen produced for derivatives such as e.g. ammonia

- Taking into account the projects which state to be operational by 2027 but which have not yet proceeded to an FID or the construction phase, the production capacity (PC) of low carbon hydrogen could increase to 43 Mt/a. By 2030 the PC of low carbon hydrogen based on current announcements could potentially reach 92 Mt/a, covering about 60% of the global hydrogen demand of 150 Mt/a as mapped out for 2030 under the IEA Net Zero Emissions scenario. However, it is highly unlikely that all of these projects will be realized. On the other hand, new projects might be initiated and pursued over time.
- Next to increasing domestic production of hydrogen, the EU is planning to import 10 Mt/a of low carbon hydrogen by 2030 to reduce its reliance on fossil fuels. However, projects that could deliver these H₂-volumes and which are well positioned to supply the European Market (e.g. the MENA region with its high solar potential) do not currently exist yet.
- Looking towards 2027, the current project pipeline in the MENA would provide just 0.6 Mt/a of hydrogen, increasing to 6.2 Mt by 2030 if all projects (i.e. including projects at a very early stage of development) are taken into account.

Estimated global low carbon hydrogen production capacity by region*



- Not all of these projects will be focused exclusively on exports as some countries will also require low carbon hydrogen to further develop their economy and follow up on decarbonisation targets.
- Small-scale low emission hydrogen trading started in 2020 but could increase significantly. According to the IEA, global announced export-oriented projects

Source: IEA (2023) H₂ Project Database & Team Consult analysis * 2030 Figures include projects at very early stage of development

amount to 16 Mt of hydrogen equivalent by 2030. However, only three projects have reached FID in 2023.

- One of the first large scale export projects for green ammonia, the NEOM Green Hydrogen Project in Saudi Arabia took FID in May 2023. From 2026 onwards green ammonia will be marketed globally.
- Considering a global increase in hydrogen demand and import requirements, this leaves a gap to be filled by future projects in the MENA and other regions, just to satisfy European import needs.

Imprint

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