

Data Insight

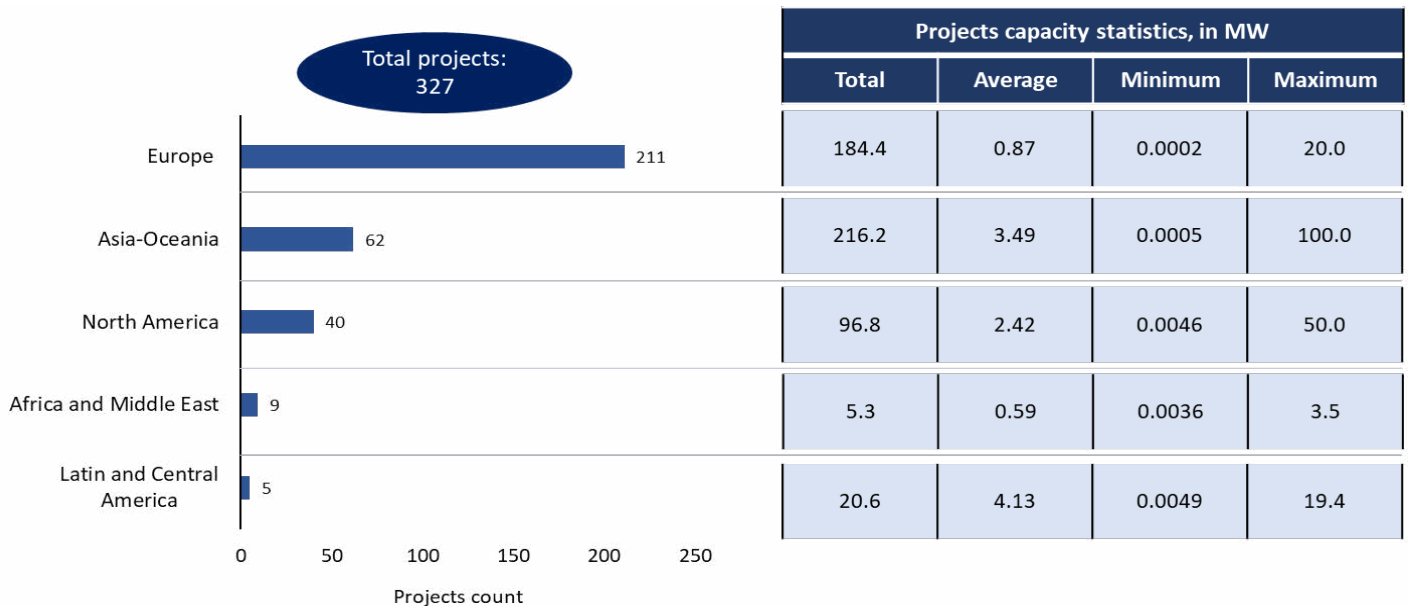
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The Current State and Future of Clean Hydrogen Projects Worldwide

This data insight reviews clean hydrogen projects worldwide that are listed in the Hydrogen Projects Database of the International Energy Agency (IEA 2021), which covers hydrogen projects for “energy or climate change mitigation purposes” based on electrolysis, fossil fuels with carbon capture and storage (CCS), or other technologies.

The current state of clean hydrogen projects worldwide (2000 - 2021)

Figure 1. Existing clean hydrogen projects worldwide (2000 - 2021).



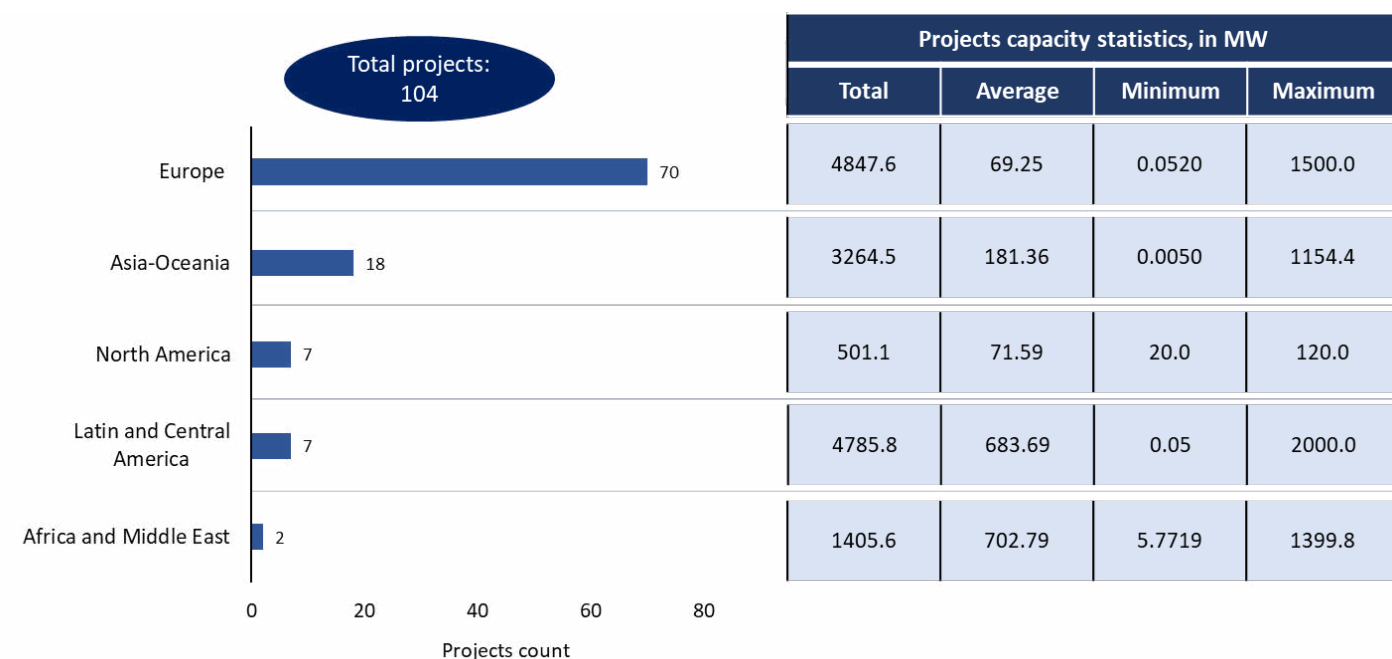
Source: IEA (2021).

- Global hydrogen production was around 90 million tonnes (Mt) in 2020. However, clean hydrogen production remains marginal, at 0.9 Mt.
- There are currently 327 clean hydrogen projects globally, of which 283 are operational; 11 have received final investment decisions (FID), while the remaining are expected to come online soon. These projects have a total production capacity of 523.4 megawatts (MW).

- In the Asia-Oceania region, Japan has the most hydrogen projects (24 sites), albeit most of these (21 out of 24) are small-scale with production capacities below 0.5 MW. China has 12 projects, of which three have FID, including the Ningxia solar hydrogen project with 100 MW capacity.
- Although North America had only five projects come online between 2010 and 2015, the pace of development has accelerated over recent years. Since 2016, 21 projects have either started operating or are expected to do so soon, including a 50 MW plant in New Jersey.
- The Middle East and Africa region has had nine projects come online since 2007, with five in Turkey. The scale of these projects is small, but recent projects in South Africa (3.5 MW) and the United Arab Emirates (1.25 MW) could pave the way for larger-scale ones.

Future clean hydrogen projects worldwide (2022 - 2027)

Figure 2. Future clean hydrogen projects worldwide (2022 - 2027).



Source: IEA (2021).

- Clean hydrogen projects are expected to continue increasing through 2027 at a slightly higher pace than during 2000-2021, with approximately 17 projects per year on average versus 15 projects per year during the previous period.
- Between 2000 and 2021, 327 projects with a total capacity of 523.4 MW came online. Between 2022 and 2027, 104 projects are expected to come online with a total capacity of 14,804.3 MW. The average project size is expected to jump from 1.6 MW during 2000-2021 to 142.3 MW during 2022-2027.
- Out of the 104 projects, 23 are under construction (21 of which are expected to come online by the end of 2022), 53 have received an FID, 21 are concept projects, and only seven will be demo projects.

- The Asia-Oceania region is expected to add 18 projects with a total capacity of 3,264.5 MW. Ten projects will be in Australia, including two projects at the gigawatt scale, bringing the total capacity of all 18 projects to 2,218 MW. China will add six projects, all dedicated to mobility, with a total capacity of 521.0 MW.
- Latin America will also have seven additional projects. Chile is positioned as a leading regional, and potentially global, clean hydrogen producer. Five of the seven projects in this region will be in Chile, accounting for almost all the region's additional capacity.
- Finally, the Middle East and Africa region counts only two future projects: the Helios Green Fuels site, a 1,400 MW project located in Neom (Saudi Arabia) for ammonia manufacturing, and a 5.8 MW Masdar City project (United Arab Emirates).

Reference

International Energy Agency (IEA). 2021. Hydrogen Projects Database. Accessed January 22, 2022. <https://www.iea.org/reports/hydrogen-projects-database>.

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