

Image of the hydrogen refuelling station to be built near Woven City, Japan.
Picture credit: Toyota Motor Corporation



HYDROGEN REFUELLING

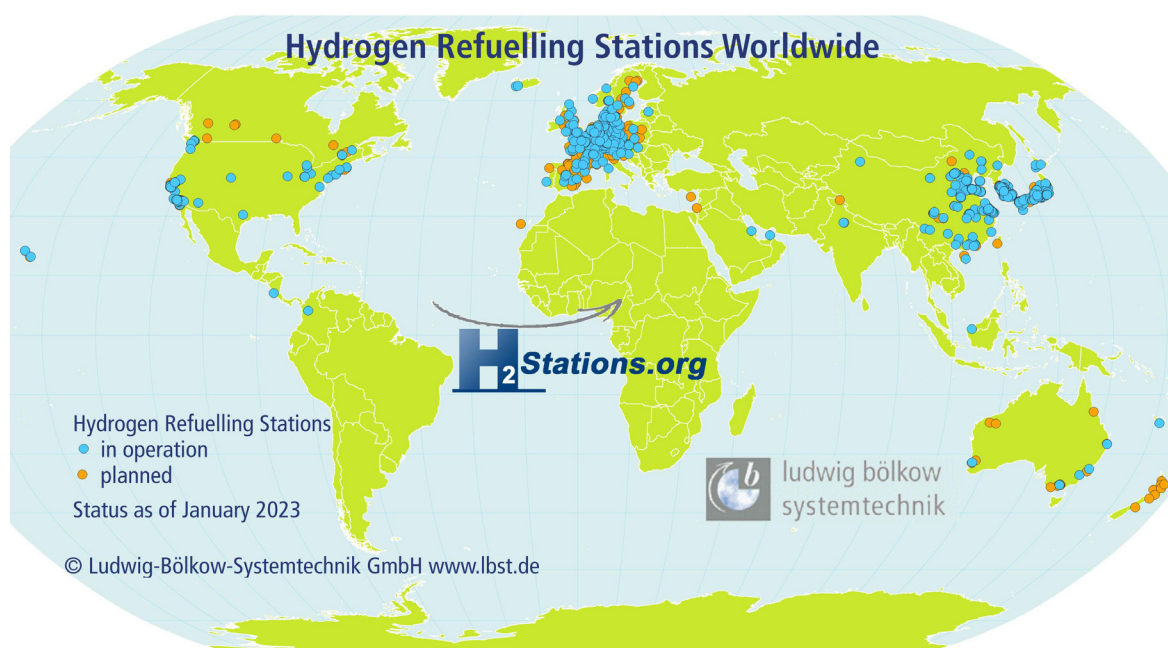
Accelerating the development of hydrogen refuelling infrastructure will enable growth in platinum-based fuel cell electric vehicles

Air Liquide and TotalEnergies recently announced their decision to create a joint venture to develop a network of more than 100 hydrogen refuelling stations, geared towards heavy-duty vehicles on major European roads in France, Benelux and Germany.

The two companies intend to combine their know-how and expertise in infrastructure, hydrogen distribution and mobility to create a major player in hydrogen refuelling solutions, contributing to the decarbonisation of road transportation in Europe.

According to H2stations.org, 814 hydrogen refuelling stations across 37 countries were in operation worldwide as at the end of 2022. The majority of these – 455 – were operational in Asia, with Japan leading the way with 165, followed by South Korea with 149. The number of hydrogen stations in China is estimated at 138.

Europe had 254 hydrogen stations at year end, 105 of which are in Germany. France is second in Europe with 44 operating stations, followed by the UK and the Netherlands with 17 each, and Switzerland with 14 stations.



North America added 11 new hydrogen refuelling stations last year. With 70 operating stations in California alone, the state continues to be the centre of gravity on the continent.

Concrete plans are already in place for 315 additional hydrogen refuelling station locations worldwide. In Japan, ENEOS, a leading company in the hydrogen value chain operating 45 commercial hydrogen refuelling stations in the four major metropolitan areas, is working with Toyota at Woven City to explore the utilisation and application of hydrogen energy. Woven City is the prototype city of the future that Toyota has started to develop in Susono City, Shizuoka Prefecture.

As part of the collaboration with Toyota, ENEOS is to construct and operate a hydrogen refuelling station for the supply of green hydrogen to Woven City. This is intended to facilitate the use of fuel cell electric vehicles (FCEVs) from passenger cars to commercial vehicles.

Last year China released the country's first long-term plan for hydrogen, including hydrogen refuelling stations. Plans are afoot for at least 800 stations

to be built by 2030, with the cities of Changzhi, Guangzhou and Dalian planning over 100 each by then.

Hydrogen benefits

Hydrogen offers clear benefits for the decarbonisation of mobility and, in order to promote its widespread use in zero emissions FCEVs, the development of refuelling infrastructure is essential to offer vehicle manufacturers and transport operators a sufficiently dense network of stations.

Platinum is the catalyst that is used in proton exchange membrane (PEM) fuel cells, the type used in hydrogen FCEVs, as it provides the durability, stability and reactivity necessary to strip the hydrogen of electrons to produce electricity. PEM technology is also used in electrolyzers to produce green hydrogen.

While hydrogen-related demand for platinum is relatively small in 2023, it is expected to grow substantially through the 2020s and beyond, reaching as much as 35 per cent of total annual platinum demand by 2040, on WPIC's projections.

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