

SPOTLIGHT ON GERMANY

The Federal Republic of Germany could be the gamechanger that makes widespread adoption of fuel cell electric vehicles in Europe a reality



Platinum is central to proton exchange membrane (PEM) fuel cell technology which, when applied to transport solutions, is poised to play a major role in accelerating the energy transition away from fossil fuels. Fuelled by hydrogen, PEM fuel cells can be used to power a multitude of transport types from passenger cars, trucks, buses and trains to ships and aeroplanes.

In Europe, Germany has set itself the target of becoming climate neutral by mid-century and it is leading the way with its recently-announced national hydrogen strategy.

The strategy forms part of the German government's post COVID-19 economic stimulus package and it will see US\$ 7.84 billion earmarked for projects that develop hydrogen production from renewable energy sources. It comes on the back of last year's remarks from Peter Altmaier, Federal Minister for Economic Affairs and Energy, signalling that Germany intends to become the global number one player in hydrogen technology.

The development of hydrogen supply infrastructure, including generation capacity and distribution networks, is not only important as Germany embraces 'green' hydrogen to help achieve its overall decarbonisation and economic goals. The move is also crucial to enabling the large-scale use of fuel cell electric vehicles (FCEVs) by providing a base for

sufficient hydrogen refuelling stations, removing one of the obstacles that currently prevents wider FCEV adoption.

Increased usage of FCEVs as part of a move away from modes of transport reliant on fossil fuels will also help Germany meet its decarbonisation goals. PEM FCEVs are an environmentally-friendly form of transport, especially when fuelled by hydrogen from renewable sources. In a PEM fuel cell, where molecules of hydrogen and oxygen are combined to generate electricity, a platinum catalyst is used. Heat and water are the only by-products, with FCEVs producing zero tailpipe emissions.

Fuel cell forerunner

Germany's ambitions for its hydrogen economy have accelerated since its National Innovation Programme for Hydrogen and Fuel Cell Technology began in 2006, funding research and development.



A Coradia iLint fuel cell train
Source: Alstom

In 2018, the country rolled-out the world's first hydrogen-powered fuel cell trains when two Coradia iLint trains, built by the French company Alstom, started running on a 100km route between the towns and cities of Cuxhaven, Bremerhaven, Bremervoerde and Buxtehude in northern German.

Today, Germany has more hydrogen refuelling stations than any other European country, with 84 in active use and a further 21 under construction, rising to a total of 400 by 2025. This compares to the current 38 active stations in the rest of Europe combined.

German industry is also getting behind the government's plans, with research showing that Germany has submitted more patents for the fuel cell sector than any other country in Europe, with

17,238 registrations. Major German corporations including Bosch and Daimler are involved in significant fuel-cell related projects. Bosch has teamed up with Powercell Sweden AB to bring fuel cells to the market by 2022 at the latest. In fact, Bosch estimates that 20 per cent of all electric vehicles worldwide will have a fuel cell powertrain by 2030. Daimler is focusing its efforts on fuel-cell systems for heavy duty vehicles like trucks and buses.

Platinum in FCEVs is currently a small, but growing, demand sector for platinum, with near-term demand growth coming predominantly from the heavy duty sector, with the potential for significant demand once fuel cell passenger cars move beyond one per cent of annual vehicle sales.

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