

Cleaner, quieter hydrogen-powered transport takes to the road



Fuel cell electric vehicles (FCEVs) powered by green hydrogen can contribute to meeting climate goals and making Europe's cities more liveable. Projects funded by the Clean Hydrogen Partnership are rolling out fuel cell electric buses, taxis and hydrogen refuelling stations to develop the market for cleaner, quieter public transport.

Public transport leads the way

The EU needs to decarbonise its transport sector and increase its energy self-sufficiency. Several EU policies and directives have already laid the foundation for low-emission transport. By replacing 'captive' fleets – of taxis and buses – which have predictable driving and refuelling patterns – with hydrogen fuel-cell-powered models, the versatility, safety and reliability of the technology is being demonstrated to the public and decision makers.

ZEFER has deployed 180 fuel cell electric taxis in Paris, London, and Copenhagen. They have driven 8.3 million km. H2ME, which started in 2015, and H2ME2, to end in June 2023, aim at deploying more than 1 100 fuel cell hydrogen cars and vans and 49 refuelling stations across 8 countries.

The 3EMOTION project has put hydrogen buses on the roads of Pau, London, Versailles, Rotterdam and Aalborg. They have driven 3.1 million km by June 2021, saving 3.8 million

kg of CO₂. Combined, the JIVE projects will deploy nearly 300 fuel cell buses (FCBs) in 22 cities across Europe by the early 2020s – the largest deployment in Europe to date.

Going the distance

Large-scale deployment of fuel-cell buses, taxis and refuelling stations in major European cities is allowing the public to experience first-hand the cleaner, quieter ride that hydrogen-powered vehicles offer. ZEFER has increased use of the refuelling station network, which is helping to make owning and operating the new technology commercially viable. The next steps include making it easier for bus operators to include hydrogen fuel cell buses in their fleets.

DRIVING DEMAND

Ensuring full commercialisation of fuel cell buses and vehicle fleets requires the appropriate regulatory framework, permits and certification schemes. Stronger demand is needed to drive down prices of hydrogen, vehicles and refuelling infrastructure relative to diesel-powered equivalents.

ON THE ROAD TO COMMERCIALISATION

The deployment of hydrogen vehicles and refuelling stations in major European cities is providing data on long-term performance and reliability and determining best practices for procurement, maintenance and operation.

The goal? To convince local and national governments to regulate for zero emission public transport systems, paving the way to full commercial deployment. **Key results?** The price of an FCB has been reduced significantly to below EUR 625 000, and new 18 m articulated models of FCBs and coaches have been announced by bus manufacturers.



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The H2ME Project
Hydrogen Mobility Europe 2
The JIVE project
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KEY ACHIEVEMENTS

7 MILLION KM

driven by 120 hydrogen taxis deployed by ZEFER in Paris and London, and still counting

180

fuel cell electric vehicles in use in Paris, London and Copenhagen under the ZEFER project

3-5 MINUTE

refuelling time achieved by hydrogen vehicles, comparable to diesel or petrol vehicles

535

Hydrogen vehicles deployed between March 2015 and May 2022 by both H2ME projects

230+

Fuel cell electric buses deployed in Germany, France, UK, Scandinavia, Spain, Italy and the Netherlands

7

regional clusters, from Scandinavia to Iberia, now exist to advance fuel cell bus

IMPACTS

PROVEN ABILITY

of hydrogen vehicles to meet drivers' daily and annual needs

SAFETY

of refuelling stations and fuel cell systems proven by ZEFER

HIGH SATISFACTION LEVELS

from drivers, technicians and passengers at four sites where buses are in regular operation

CAPEX TARGET

of <EUR 650 000 (JIVE) and <EUR 625 000 (JIVE 2) per non-articulated bus met by several suppliers

LARGEST SINGLE ORDER

for FCBs in Europe to date (100) placed by Cologne regional transport in May 2022

SEAMLESS INTEGRATION

of FCBs with diesel buses, due to the same flexibility and operating procedures



Co-funded by
the European Union