

H₂ME 2

HYDROGEN MOBILITY EUROPE 2



Project ID	700350
PRR 2024	Pillar 3 – H ₂ end uses: transport
Call topic	FCH-03.1-2015: Large scale demonstration of hydrogen refuelling stations and FCEV road vehicles – including buses and on site electrolysis
Project total costs	EUR 106 490 818.38
Clean H ₂ JU max. contribution	EUR 34 999 548.50
Project period	1.5.2016–31.12.2023
Coordinator	Environmental Resources Management (ERM) Ltd, United Kingdom
Beneficiaries	AGA AB, Air Liquide Advanced Business, Air Liquide Advanced Technologies SA, Air Liquide France Industrie, Alphabet Fuhrparkmanagement GmbH, Audi AG, B. Kerkhof & Zn. BV, Bayerische Motoren Werke AG, Brintbranchen, Centre of Excellence for Low Carbon and Fuel Cell Technologies, Communauté Urbaine du Grand Nancy, Compagnie Nationale du Rhône SA, Daimler AG, Eifer Europäisches Institut für Energieforschung EDF KIT EWIV, Element Energy, ERM UK, Elogen, ERM France, GNVERT SAS, H2 Mobility Deutschland GmbH & Co. KG, Honda Motor Europe Ltd, Honda R&D Europe (Deutschland) GmbH, Hydrogene De France SA, Hydrogène Grand Ouest, HYOP AS, Hype, Hype Assets, Hysotco, Hysolutions GmbH, HYSSY, Icelandic New Energy Ltd, Intelligent Energy Ltd, Íslenska Vetrnisfélagið EHF, ITM Power (Trading) Ltd, Københavns Kommune, Linde Gas GmbH, Manufacture Française des Pneumatiques Michelin, McPhy Energy, McPhy Energy Italia SRL, Mercedes-Benz AG, Mercedes-Benz Fuel Cell GmbH, Ministerie van Infrastructuur en Waterstaat, Nel Hydrogen AS, Nel Hydrogen Electrolyser AS, Nissan Motor Manufacturing (UK) Ltd, Open Energi Ltd, Renault SAS, Renault Trucks SAS, Réseau GDS, R-Hynoca, Société d'économie mixte des transports en commun de l'agglomération nantaise, Stedin Diensten BV, Stedin Netbeheer BV, Stichting Cenex Nederland, Symbio, Tech Sports Compagnie, University of Manchester, Toyota Danmark AS, Toyota Norge AS, Waterstofnet VZW

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PROJECT AND GENERAL OBJECTIVES

H₂ME 2 brings together actions in eight countries in a 7-year collaboration to deploy 20 hydrogen refuelling stations (HRSs) and > 1 100 vehicles. The project has performed a large-scale market test of a large fleet of fuel cell electric vehicles operating in real-world customer-focused environments across multiple European regions. In parallel, it has demonstrated that the hydrogen mobility sector can support the wider European energy system through electrolytic hydrogen production.

Prior to H₂ME, there were few large deployments of fuel cell hydrogen vehicles in Europe. The H₂ME projects have contributed to deploying one third of fuel cell hydrogen vehicles on the road and 20 % of HRSs open today in Europe. In addition, H₂ME has encouraged application to other types of vehicles (including buses and trucks) by supporting the construction of HRSs.

NON-QUANTITATIVE OBJECTIVES

- More than 1 100 fuel cell vehicles and 20 HRSs will be deployed by the end of the project.
- The project aims to demonstrate the electrolyser-integrated HRS operating to allow grid balancing. H₂ME 2 includes a dedicated work package to assess the way in which electrolytic hydrogen production in the mobility sector can link to the wider energy system.
- Multiple original equipment manufacturers (OEMs) supply vehicles, including cars and utility vehicles. H₂ME 2 aimed to deploy cars and light-duty vans from OEMs including Mercedes, Honda, Symbio, Hyundai and Toyota.
- H₂ME 2 aimed to ensure the circulation of knowledge acquired in the project. A dedicated work plan and dissemination and exploitation plan were developed to achieve this. Three observer countries are included in the project coalition.

PROGRESS AND MAIN ACHIEVEMENTS

- All 20 HRSs planned for the project had been commissioned and were in operation by the end of the project. Combined with the HRS deployed in H₂ME, this constitutes the first step in constructing a European infrastructure network.
- Over 1 100 vehicles were deployed in H₂ME 2. Further deployment and collaboration are expected beyond the end of the project.
- Demonstration in real-world operation started in 2015 – carried out jointly with H₂ME – for over 1 400 vehicles from five OEMs (Mercedes, Honda, Hyundai, Symbio and Toyota) across eight countries and 50 HRSs from 10 suppliers across six countries (Denmark, France, Iceland, the Netherlands, Sweden and the United Kingdom).
- The fuel cell electric vehicles worked reliably, with new models offering increased performance becoming available on the market.
- The project generated a vast base of operational data from vehicles and HRSs, and involved further fact-based analyses of vehicles' and HRSs' performance. Since 2015, > 40 million kilometres have been driven and 915 t of H₂ distributed in 360 000 events (figures from January 2024).
- Green mass mobility and logistics solutions were proven to be effective in cities and regions, with ranges and refuelling times similar to those of conventional vehicles. The experience gained gives a robust springboard for further roll-outs.
- Across H₂ME and H₂ME 2, around 100 reports were prepared, with the majority publicly available on the project's website.

FUTURE STEPS AND PLANS

The project has finished.

PROJECT TARGETS

Target source	Parameter	Unit	Target	Achieved to date by the project	Target achieved?	SOA result achieved to date (by others)	Year for reported SOA result
HRSs							
Project's own objectives, MAWP addendum (2018–2020) and AWP 2015	Minimum period of HRS operation	months	36	58	✓	32	2017
	HRS availability	%	98	96	⚙️	98	2017
	Hydrogen purity	%	99.99	99.99	✓	99.99	2017
FC vehicles							
Project's own objectives, MAWP addendum (2018–2020) and AWP 2015	Minimum period of vehicle operation during project	months	36	60	✓	12	2017
	Vehicle availability	%	98	Around 100	✓	98	2017