

H2ME2 & ZEFER

Flagship projects in hydrogen mobility for light duty vehicles in Europe



Alex Stewart
Partner
Environmental Resources Management

[Hydrogen Mobility Europe \(h2me.eu\)](http://h2me.eu)
[Zefer | Zero Emission Fleet Vehicles for European Roll-out](#)

Alex Stewart Alex.Stewart@erm.com

Lisa Ruf Lisa.Ruf@erm.com

//EU HYDROGEN
RESEARCH DAYS
15-16 NOVEMBER



Hydrogen
Mobility Europe



Co-funded by
the European Union

Projects Overview



Hydrogen Mobility Europe 2 (H2ME2)

- Call year: 2015
- Call topic: H2020-JTI-FCH-2015: Societal Challenges - Smart, Green And Integrated Transport
- Project dates: 01/05/2016 - 31/12/2023
- % stage of implementation 01/11/2023: 98%
- Total project budget: € 108 million
- CH2 JU max. contribution: c. € 35 million



Zero Emission Fleet for European Roll-out (ZEFER)

- Call year: 2017
- Call topic: FCH-01-6-2017: Large scale demonstration of Hydrogen Refuelling Stations and Fuel Cell Electric Vehicle (FCEV) road vehicles operated in fleet(s)
- Project dates: 01/09/2017 - 31/08/2023
- % stage of implementation: 100%
- Total project budget: €17.5 million
- CH2 JU max. contribution: c. €5 million

The funding aims to move hydrogen mobility from the demonstrator stage to pre-commercial stage

The H2ME initiative will deploy up to 1400 FCEVs and >45 HRS across 10 countries by 31/12/2023

Endorsers:

- Mobilité Hydrogène France
- H₂ Mobility
- UK H₂ Mobility
- Scandinavian Hydrogen Highway Partnership
- Hydrogen mobility grouping in Benelux
- Hydrogen mobility grouping in Austria
- Hydrogen mobility grouping in Italy



Concept:

- Joint initiative from the most ambitious European hydrogen mobility initiatives
- One 'working framework' linking these initiatives, which provide the opportunity to:
 - identify optimal commercialisation strategies and synergies between countries
 - develop European strategies for commercialisation

New hydrogen refuelling stations:

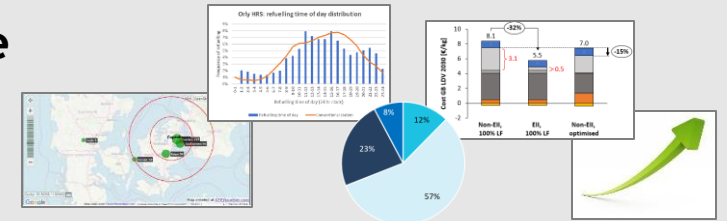


Fuel cell vehicles:

- Up to 1100 OEM cars
- Up to 400 fuel cell RE-EV vans

Performance and market analysis conducted during the project:

- Data performance analysis
- Market readiness and customer value proposition
- Electrolyser in grid operation



HRS under commissioning (Yellow circle)
HRS commissioned (Green circle)

HRS: Hydrogen Refuelling Station
FCEV: Fuel Cell Electric Vehicle

ZEFER ended on 31/08/2023 and the project successfully delivered its objectives and contributed to developing learnings for the sector



ZEFER deployment

- 180 Fuel Cell Electric Vehicles (FCEVs)
- Hydrogen Refuelling Stations (HRS) upgrades at 3 locations
- 3 European capitals

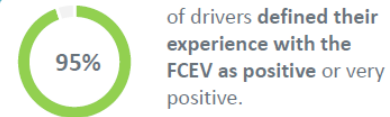
- Vehicles performance have been confirmed through questionnaire surveys and wide database of **15 017 213 kilometres** amassed since April 2018.
- While FCEVs come at a premium today compared to other vehicles, the **customer proposition is attractive for fleet operators.**
- **Early HRS network can cater for fleet demands** but attention must be put on reliability and redundancy.



Fleet operators and drivers have high opinions of FCEVs in terms of reliability and performance

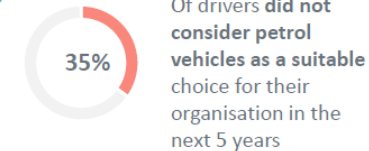
- Drivers and fleet operators are looking for solutions to transition to **zero-emission alternatives** for their operations.
- FCEVs have **exceeded driver and operator expectations** in terms of reliability and performance.
- **Long ranges** and **quick refuelling times** are essential to elevating the value of FCEVs above zero-emission alternatives.
- HRS have provided a good foundation for the ZEFER deployments but **limited infrastructure networks** and challenges with **reliability** have prevented the full operational advantages of FCEVs being realised.

Appraisals



A vast majority of drivers was entirely satisfied with the performances of the FCEV, in particular their acceleration, top speed and noise level.

Motivation



Taxi drivers and fleet operators increasingly feel the necessity to decarbonate their activity and are turning to zero-emission alternatives such as FCEV to do so.

Improvements



Satisfaction with the HRS networks has differed significantly between sites. An overall improvement to the number of sites and reliability of stations have been pointed out as necessary to scale up the technology.

Methodology

1. At the end of the ZEFER project, 180 vehicles have been deployed in Paris, London and Copenhagen. Drivers and fleet operators of vehicles deployed in ZEFER and other projects have been contacted to contribute to the survey campaign.
2. Overall 134 responses had been received for the pre-operation questionnaire (from GreenTomatoCars and DRIVR), and 343 for the during-operation questionnaire (from GreenTomatoCars, Hype, DRIVR and the Metropolitan Police) providing valuable insights into the customer value proposition.

Conclusions : FCEVs can play a role in decarbonising transport and cities with high potential for replicability

Operators' needs

- Increasingly, fleet operators are being driven to find low-emission and **even now zero-emission alternatives** for their operations.
- Compared to BEVs, **FCEVs have two main advantages**: A longer range (up to 650 kms) and a quicker refuelling time (3-5 minutes).

Technology performance

- FCEVs **exceed drivers and operators' expectations** in terms of reliability & performance.
- Long ranges** and **quick refuelling times** are essential to elevating the value of FCEVs above zero-emission alternatives.
- HRS have provided a good foundation for the deployments but **limited infrastructure networks** and challenges with **reliability** can prevent the full operational advantages of FCEVs being realised. Planning for redundancy is key to ensure smooth operation.

Cost reduction

- At low levels of demand the cost of supplying H2 can be high. **Network planning** is key to ensuring **economies of scale** and **adequate proposition to customers**.
- FCEVs still have a significant cost premium compared to diesel vehicles but can **reach parity**.
- An unsubsidised business case could be just **one generation away**.

Public support

- Success stories** are linked to **financial incentives/tax exemptions** for zero emission vehicles, as well as **support from local authorities** and **restrictions placed on diesel vehicles**.
- Operational advantages** are key part of the decision process for fleet operators, thus can be powerful levers.

//EU HYDROGEN
RESEARCH DAYS
15-16 NOVEMBER

Thank you for your attention

Any questions?

