H2ME / H2ME 2 Hydrogen Mobility Europe

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Programme Review Days 2019

Brussels, 19-20 November 2019

PROJECT OVERIVEW

- **Call year:** 2014 / 2015
- **Call topic:**
  - FCH-01.7-2014
  - FCH-03.1-2015
- **Project dates:**
  - 01.06.15 – 31.05.20
  - 01.05.16 – 30.06.22
- **% stage of implementation :** 60%
  Total project budget: 170 €
- **FCH JU max. contribution:** 67 €

- **Partners:**

H2ME – a major pan-European effort to support commercialisation

These activities are part of a much larger vehicle and HRS rollout in Europe

H2ME 1

29 stations
>300 cars and vans
€70m total cost
€32m funding
Started June 2015

Hydrogen Mobility Europe

- **>45 refuelling stations**
- **>1400 cars, and vans**
- **€170m total cost**
- **€67m funding**
- **> 40 organisations**

A major European activity!

H2ME 2

20 stations
>1100 cars, vans and trucks
€100m total cost
€35m funding
Started May 2016

Bringing H2 mobility initiatives into one framework

H2ME Project overview (2015 – 2022)

HRS: Hydrogen Refuelling Station
FCEV: Fuel Cell Electric Vehicle
RE-EV : Range-Extended Electric Vehicle
OEM: Original Equipment Manufacturer

Endorsers:

- Mobilité Hydrogène France
- H_2 Mobility
- UK H_2 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:
  1) identify **optimal commercialisation strategies** and **synergies between countries**
  2) develop **European strategies for commercialisation**

New hydrogen refuelling stations:

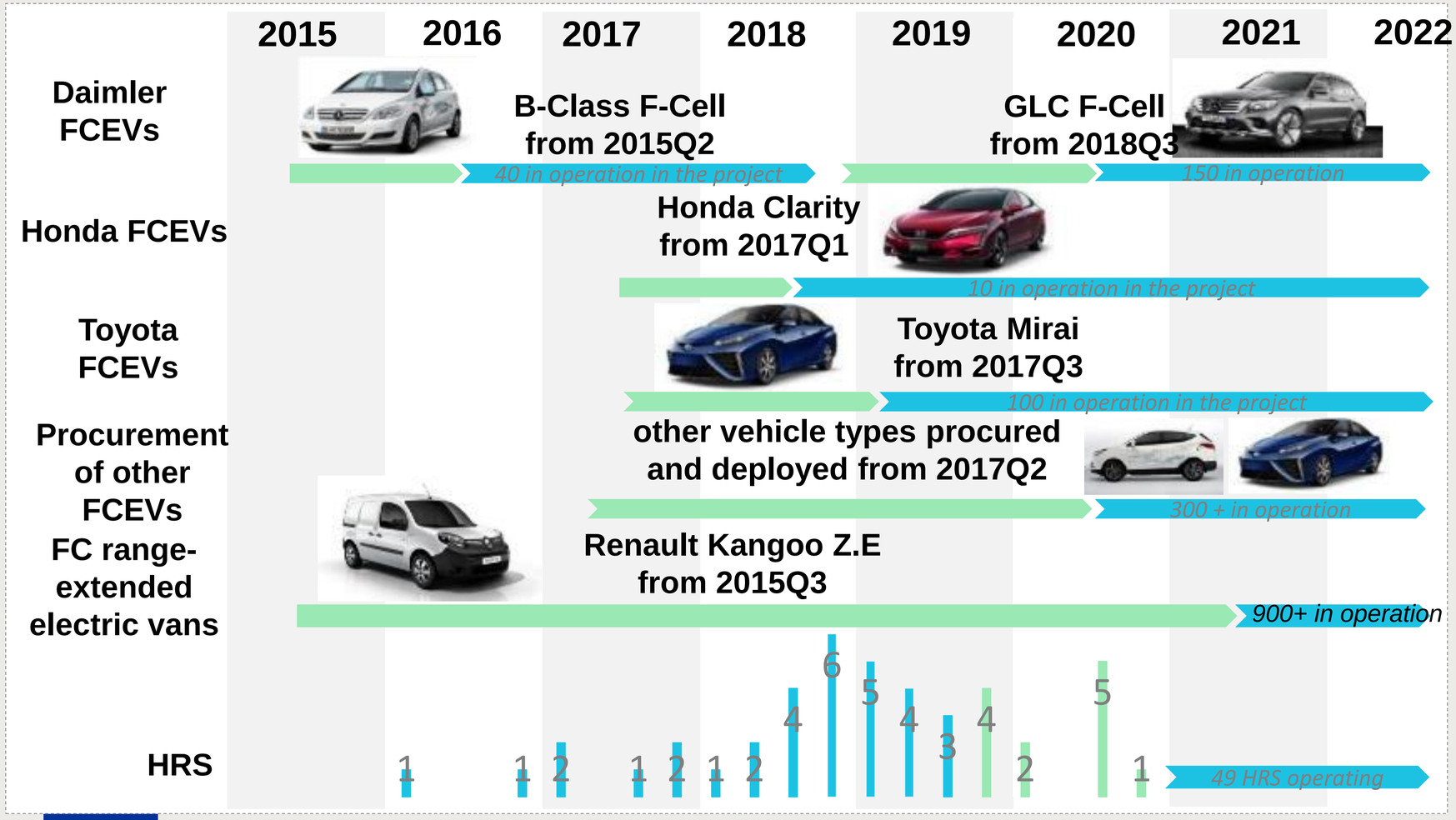
- **20** - 700bar HRS in Germany
- **12** - 700bar HRS in Scandinavia
- **11** - 350bar and 700bar HRS in France
- **6** – 350bar and 700bar HRS in the UK
- **1** - 700bar HRS in NL

Fuel cell vehicles:

- **500** OEM FCEVs
- **900** fuel cell RE-EV vans

H2ME is well underway but activities are planned until 2022

Deployment status and timeline



Legend:

Deployment phase

All in operation

Project snapshot:

32 HRS and >550 vehicles have been deployed to date:

- 194 Renault Kangoo vans
- 40 Daimler B Class F-CELL and 60 Daimler GLC F-CELL
- 107 Toyota Mirai
- 10 Honda Clarity
- 106 vehicles procured by project partners

Significant HRS and Vehicle deployment outside H2ME projects

The H2ME project is supporting advancements on the state of the art for the sector






Fleet validation for Fuel Cell Electric Vehicles

- Vehicles have reported a total of 11.59 M km driven since the first vehicles were deployed in Q3 2015.
- The furthest distance travelled by one vehicle was 120 000 km, accumulated since August 2017.
- Daily distance covered for 500-550 km reported.
- Average availability for the vehicle is effectively 99%+ for all FCEVs.
- No major safety incidents reported.

Network validation for Hydrogen Refueling Stations

- All H2ME HRS have dispensed 72 132 kg of H2 in 35 518 refuelling events since March 2016.
- The most utilised HRS in the project alone has dispensed 32 464 kg H2 since Q3 2017 due to usage from STEP/Hype taxis.
- Average availability HRS for best performing HRS reached 99.9%.
- No major safety incidents have been reported.





Experience shows increasing convergence with strategies and focus on higher utilisation rates and joint initiatives

H2 mobility rollout strategies

- Colocation of vehicles and HRS. The low number of HRS remains a barrier to adoption; each fleet has their own requirements for HRS locations depending on their operations.
- Using mixed vehicle types and high demand applications to help sustain the early network.
- Developing viable clusters of stations in key locations. A min. of 2 HRS is required to establish demand from light fleet applications.
- Increasing number of joint initiatives. Such partnerships can help to unlock benefits of scale for FCEV and/or HRS business cases.

Identification of sweet spots for early adoption of FCEVs

- Through loading of stations with mixed vehicle types, with a focus on heavy duty vehicles e.g. buses and trucks
- Via high mileage applications and operational advantage e.g. taxi fleets and long range with fast charging

Conclusions: **Demand for FCEVs and associated HRS is growing, driven by increasingly ambitious emissions targets and policy at European, national and local scale.**

And that further efforts are required to prepare for the commercial roll-out

HRS network implementation

- HRS deployment times are still subject to delays at the permitting stage due to the lack of standardised permitting process.
- Access to utilities and land can be problematic.
- Guidance have been developed for most countries and commissioning time is decreasing.

Costs reduction

- At low levels of demand (<200kg/day) the cost of producing and supplying hydrogen at an HRS can be high.
- FCEVs also still have a significant cost premium compared to diesel vehicles.
- Economies of scale and technology learning curves could enable vehicles and hydrogen to be cost-competitive with counterfactuals. this is starting to be achieved in specific cases.

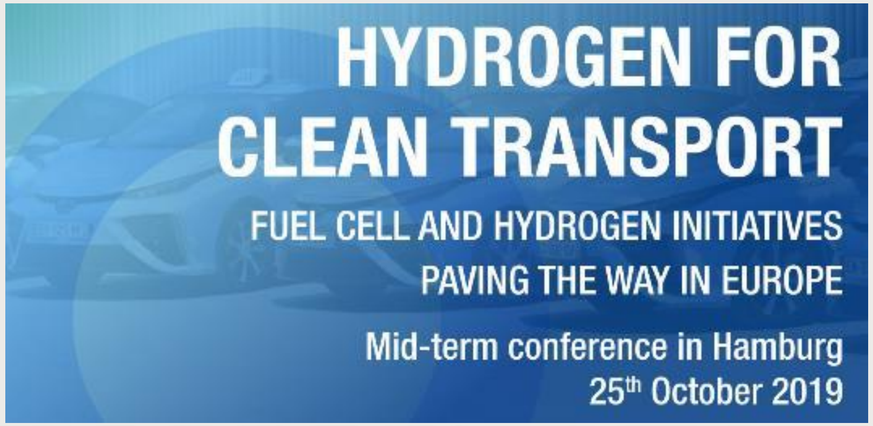
Public sector support

- Business cases can be improved by combining public sector support with partnerships and JV.
- Success stories linked to financial incentives/tax exemptions for zero emission vehicles, as well as restrictions on diesel vehicles.

Conclusions: **To achieve further scale-up, effective short-term solutions and public funding are needed to ensure that prices for hydrogen and vehicles are sufficiently low to stimulate demand.**

H2ME vehicles travelled 6,000km to celebrate the expanding network of refuelling stations

H2ME European Road trip 24 October 2019



Hydrogen Mobility Europe

Hydrogen Europe

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Thank you for your attention !

ACKNOWLEDGEMENTS

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