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Emerging Conclusions from the Hydrogen Mobility Europe Project

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Emerging conclusions from the H2ME project

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H2ME – a major pan-European effort to support commercialisation

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

Hydrogen Mobility 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

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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

Hydrogen Mobility Europe

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

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H2ME brings together high level partners in these initiatives in a joint European approach

Hydrogen Mobility Europe

The results generated by the project are shared with industry, politicians, and the wider public to support the commercialisation of hydrogen mobility.

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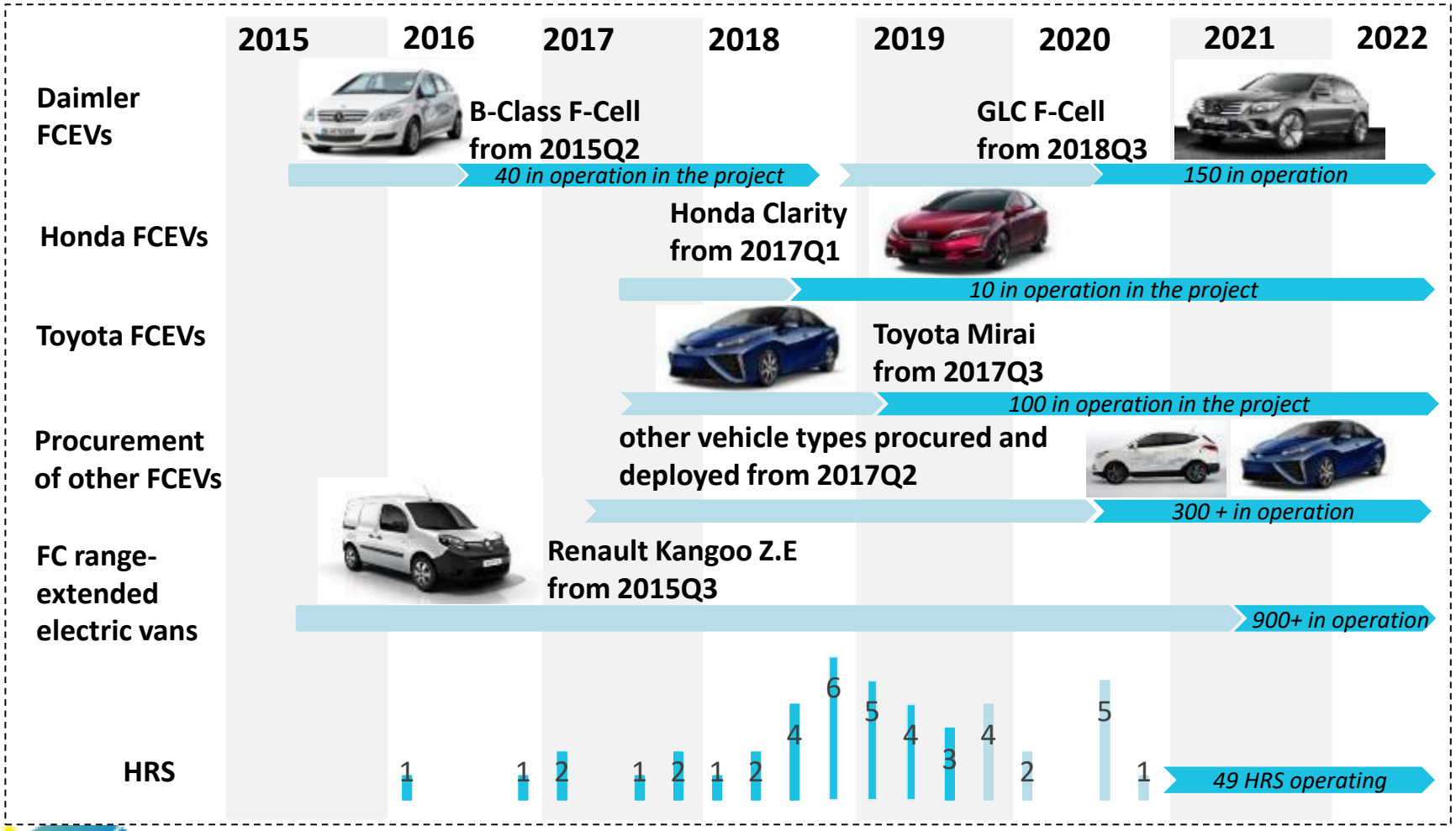
H2ME is well underway but activities are planned until 2022

Deployment status and timeline

Hydrogen Mobility Europe



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

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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

H_2 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 with authorities
- 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**

Thank you for your attention

Hydrogen Mobility Europe

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