FUEL CELL SYSTEMS®

Who are we?

UK Fuel Cell Specialists

Allowing our customers to benefit from our industry knowledge, experience and diverse product portfolio.

What do we do?

Design Solutions

Build Bespoke Systems

Globally Source & Distribute Fuel Cells

Available FC systems

40w – 2MW
Multi Technology:
Hydrogen, Methanol, Propane, Biogas, Natural Gas

Low Temperature

- DMFC – Direct Methanol – 75ºC
- PEM – Proton Exchange Membrane – 75ºC
- AFC – Alkaline Fuel Cells – 80ºC

High Temperature

- PAFC – Phosphoric Acid - 200ºC
- MCFC – Molten Carbonate Fuel Cell – 600ºC
- SOFC – Solid Oxide Fuel Cell – 1000ºC

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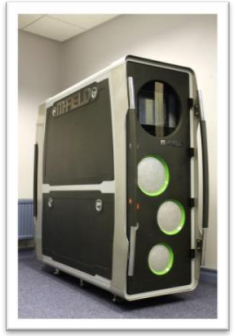
	25W – 100W	100W – 1kW	1kW – 10kW	10kW - 100kW	100kW – 200kW	400kW – 1.2MW	1.4MW – 3.7MW
FUEL USED							
Methanol	○	○	○				
Hydrogen		○	○	○	○		
Propane		○					
Natural Gas						○	○
TECHNOLOGY							
DMFC	○	○					
PEM		○	○	○	○		
SOFC		○	○				
AFC			○				
PAFC						○	○
MCFC							○
TYPE OF POWER							
Stationary	○	○	○	○	○	○	○
Portable	○	○					
Motive				○	○		
APPLICATION							
Standby Power	○	○	○	○			
Prime Power	○	○				○	○
Off-grid telemetry	○	○					
Off-grid CCTV	○	○					
Portable Signage, Lighting	○	○					
Automotive				○	○		
Telecommunications Backup			○				
Small Computer Room Backup			○				
Large Computer Room Backup				○			
Data Centre Backup					○		
Prime Power (CHP)						○	○

FUEL CELL SYSTEMS®

This central section is predominantly hydrogen fuel cell technology. It encompasses the fuel cell buses, cars and fork lifts as well as smaller buildings.

The primary issue for these applications is how to get the hydrogen to the system.



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PAFC						○	○
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TYPE OF POWER							
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Portable	○	○					
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Telecommunications Backup			○				
Small Computer Room Backup			○				
Large Computer Room Backup				○			
Data Centre Backup					○		
Prime Power (CHP)						○	○

UK H2 Mobility Target:

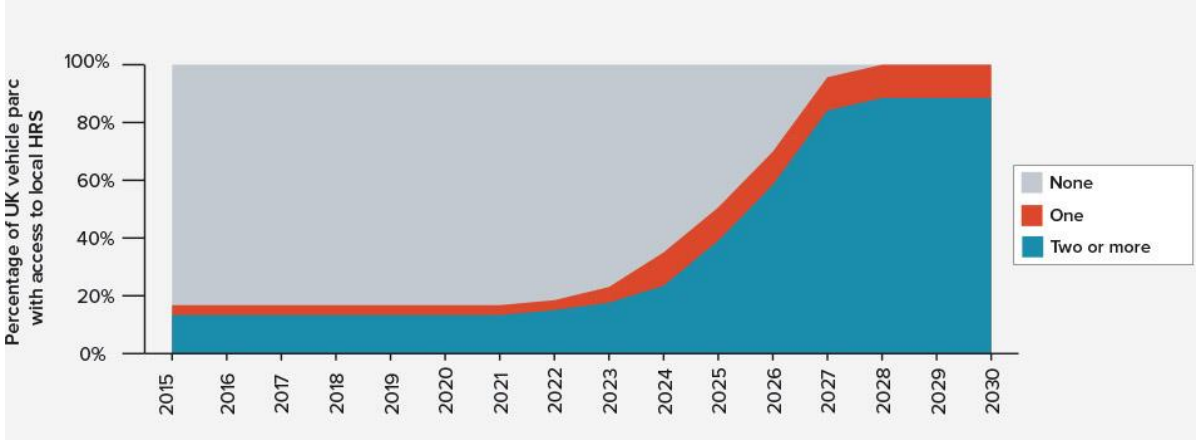
65 hydrogen stations across the UK by 2020

Current publicly accessible sites:
Heathrow, Hendon, Swindon x2, Teddington,

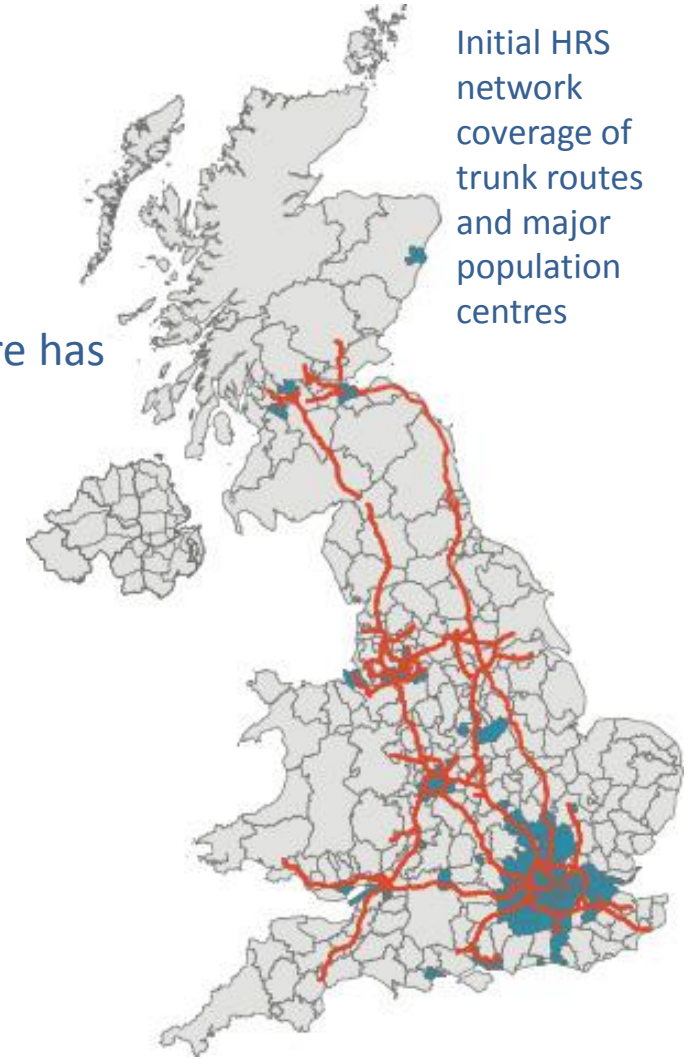
Rainham, Rotherham, Aberdeen, Beaconsfield

Plans in place for another 5-10 but at approx. 2 years per installation, the UK is way behind target.

Both Toyota and Hyundai have stated that lack of infrastructure has limited UK vehicle deployment.



The development of local HRS network coverage in terms of the proportion of the UK vehicle parc with access to zero, one and two or more HRS in their local district.



Initial HRS network coverage of trunk routes and major population centres

Refuelling Product Spectrum

HySerVE

Mini Hydrogen Dispenser

50 miles

OLEV Truck

Mobile HRS

60kg storage with compression

Full Static Station

Hydrogen producing fully installed station

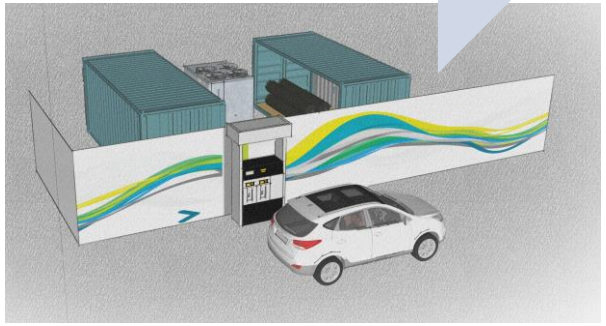
HyVan

Compact Mobile HRS

22kg storage

Temporary HRS

Containerised station with external hydrogen

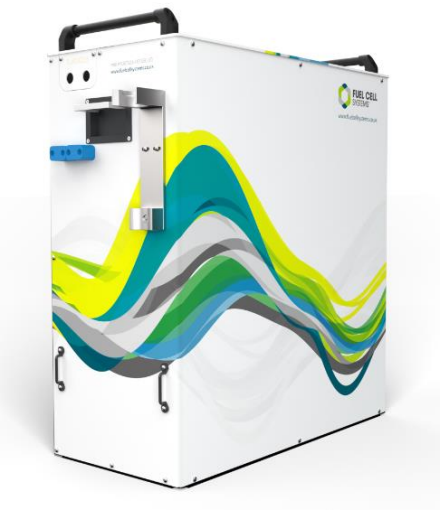


Mini Hydrogen Dispenser

Funded by UK Government

This ‘hydrogen jerry-can’ offers an emergency fill of 30-50 miles to rescue a stranded vehicle.

Successful project with product available from Sept 2018.

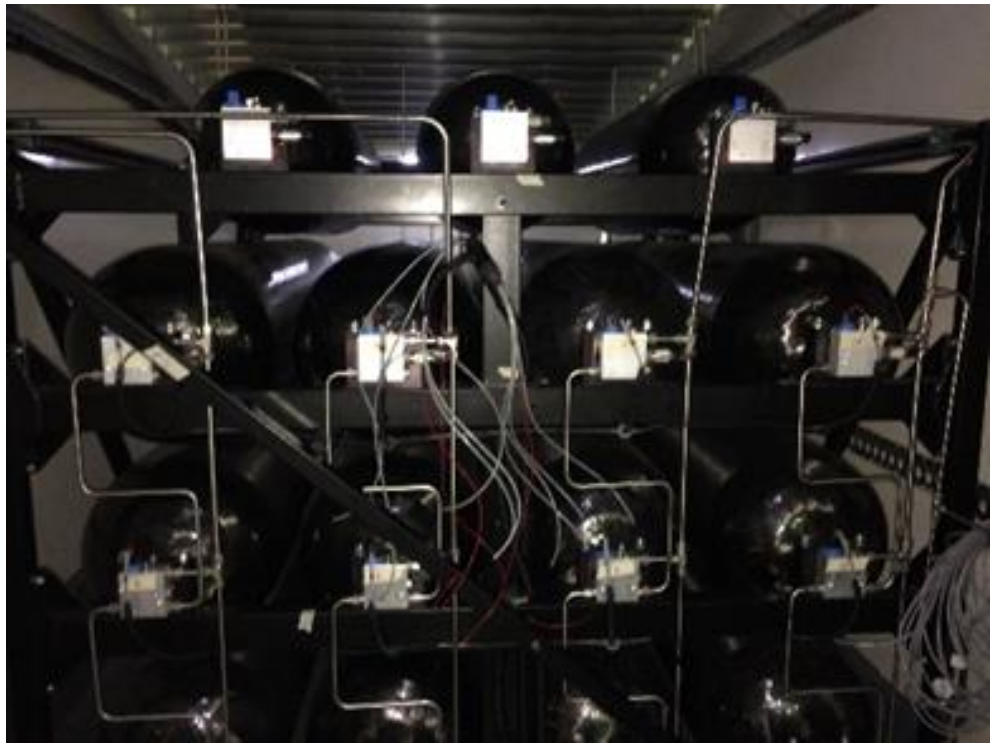


H2 Refuelling Truck

Funded by UK Government

This project was commissioned by the Department for Transport (DfT) via the Office of Low Emission Vehicles (OLEV).

Offers a H2 refuelling solution for vehicle demonstrations, exhibitions, static station location trials, refuelling delivery service…



The Tank Problem

EC79 regulations

…For transportation of the gas as a source of fuel for the vehicle within which it is located (i.e. in its fuel tank).

Exempt from ADR.

Equivalent or exceeds TPED for:
Tensile properties
Liner materials
Liner burst test
Cylinder burst test (exceeds)
Drop test (exceeds in one plane)
Penetration tests.
Extreme temperature cycling.

TPED regulations

…For the transportation of the gas for any other purpose

Comes under ADR.

Doesn't match EC79 regulations in a few specific areas:
Pressure cycle tests – but the EC79 'leak before break' would mitigate the slight differences.
Accelerated stress rupture test – slightly different temperatures ad pressures.
Bonfire test – TPED requires horizontal and vertical tests.
Drop test - TPED requires 5 orientations.

Thank you

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