H2HAUL

HYDROGEN FUEL CELL TRUCKS FOR HEAVY-DUTY, ZERO EMISSION LOGISTICS

Project ID:	**826236**
PRD 2023:	**Panel 3 – H2 end uses – transport**
Call topic:	**FCH-01-1-2018: Large scale demonstration of H2 fueled HD trucks with high capacity hydrogen refueling stations (HRS)**
Project total costs:	**EUR 33 274 858.50**
Clean H_2 JU max. contribution:	**EUR 12 000 000.00**
Project period:	**2.1.2019–31.12.2025**
Coordinator:	**Element Energy Limited, United Kingdom**
Beneficiaries:	ERM France, Dats 24, Plastic Omnium New Energies Wels GmbH, H2 Energy AG, Air Liquide France Industrie, VDL Enabling Transport Solutions BV, VDL Special Vehicles BV, EOLY, FPT Motorenforschung AG, Hydrogenics GmbH, IRU Projects ASBL, FPT Industrial SpA, Air Liquide Advanced Technologies SA, Sphera Solutions GmbH, IVECO SpA, Elringklinger AG, Etablissementen Franz Colruyt NV, WaterstofNet VZW, Air Liquide Advanced Business, Totalenergies Marketing Deutschland GmbH, PowerCell Sweden AB, Union Internationale des Transports Routiers (IRU), Bayerische Motoren Werke AG, Robert Bosch GmbH, Hydrogen Europe

https://www.h2haul.eu/

PROJECT AND OBJECTIVES

H2Haul brings together two major European truck OEMs (IVECO and VDL) and three fuel cell stack/system suppliers (Plastic Omnium, Bosch and PowerCell) to develop and demonstrate fleets of heavy-duty trucks in day-to-day commercial operations at four sites across four countries. The overall objective of H2Haul is to prove that hydrogen trucks can be a practical zero-emission and zero-carbon solution for much of Europe's trucking needs and, in doing so, pave the way for the commercialisation of fuel cell trucks in Europe. The project is currently at the end of the planning and pre-deployment phase, and all trucks and hydrogen refuelling stations (HRSs) funded in the project are expected to be deployed in the next 12 months.

NON-QUANTITATIVE OBJECTIVES

- H2Haul aims to develop long-haul heavy-duty (26 t and 44 t) fuel cell trucks that meet customers' requirements in a range of operating environments. The truck designs and specifications are being finalised in alignment with specific customer requirements and mission profiles. The objectives are expected to be met.
- The project aims to homologate three fuel cell truck types to certify that they are safe to use on Europe's roads. Truck OEMs are working closely with hydrogen safety experts and the relevant certification bodies to secure all necessary safety approvals for using the trucks on public roads in Europe.
- It aims to develop the business case for the further roll-out of heavy-duty fuel cell trucks. H2Haul will provide a valuable database of real-world performance information and insights into the next steps required for the commercialisation of this sector. The business case is to be developed based on fuel cell truck designs that meet customers' needs. The operation of fuel cell trucks and the subsequent data collection will highlight the costs involved in the technology. Analysis will be carried out to highlight the economics of more ambitious deployments of many tens of vehicles or more.
- H2Haul aims to prepare the European market for the further roll-out of fuel cell trucks through (i) the development of innovative commercial models and (ii) the dissemination of information from the project to a wide audience of relevant stakeholders. Communication activities in the first and second years of the project have stimulated significant interest from relevant audiences.

PROGRESS AND MAIN ACHIEVEMENTS

- The fuel cell truck technical specifications were finalised. Data were gathered on the technical specifications of the fuel cell trucks and HRSs.
- The first project HRS was deployed.
- The second observer group meeting took place.

FUTURE STEPS AND PLANS

- H2Haul will deploy the VDL and IVECO trucks. The VDL trucks were due to be delivered to Colruyt between March and June 2023, to start commercial operation. The IVECO beta trucks are currently being assembled with fuel cells from Bosch and will serve as prototypes for the 12 gamma trucks that will be delivered to end users in France, Germany and Switzerland between November 2023 and March 2024.
- The project will commission and start the operation of all remaining project HRSs. Currently, one HRS is in operation in Switzerland; the Belgian and French HRSs are planned to be commissioned by the beginning of summer 2023. The HRSs in Germany are currently being planned, and supplier selection is ongoing. Deployment is expected to take place at the end of 2023 or beginning of 2024.
- H2Haul will continue high-profile dissemination and lobbying work through attending and delivering presentations at key conferences and events. The next observer group meeting was due to be held in April 2023, and other stakeholder engagement activities will continue. The results will be disseminated extensively.

QUANTITATIVE TARGETS AND STATUS

Target source	Parameter	Unit	Target	Target achieved?
Project's own objectives and MAWP addendum (2018–2020)	Truck operational period	months	Start of operation including ramp-up phase: minimum of 24	
	Truck distance travelled	km	Minimum of 30 000 per truck and year, on average per site	
	Truck availability	%	> 90 on a fleet basis after an initial ramp-up phase of a maximum of 6 months	
	Truck-specific fuel consumption	kg/100 km	< 7.5 (rigid, @ 30–50 % load, inner-city delivery (< 25 km/h on average)) < 8.5 (tractor with semi-trailer @ 30–50 % load, long-haul delivery (> 65 km/h on average))	
	Availability of HRSs (by end of project)	%	99	⚙
	MDBF	km	> 2 500	
	Well-to-wheel CO_2 emissions of < 50 % of those of diesel trucks	kg CO_2/km	kg CO_2/vehicle-km (per vehicle type, average across fleet) < 50 % compared with a diesel truck	
	Speed of hydrogen dispensing	kg/min	> 2.5 kg/min	
	Cost of hydrogen dispensed to HRS	€/kg	≤ €7.50/kg dispensed (excl. taxes) at end of project – in practice, lower values are expected	
	Amount of hydrogen dispensed to project trucks	kg/year	> 2 500 kg per truck per year	

Clean Hydrogen Partnership
Co-funded by the European Union