JIVE

JOINT INITIATIVE FOR HYDROGEN VEHICLES ACROSS EUROPE

Project ID	735582
PRR 2024	Pillar 3 – H_2 end uses: transport
Call topic	FCH-01-9-2016: Large scale validation of fuel cell bus fleets
Project total costs	EUR 88 391 377.79
FCH JU max. contribution	EUR 32 000 000.00
Project start - end	1. 1. 2017–30. 6. 2024
Coordinator	Environmental Resources Management (ERM) Ltd (previously Element Energy Ltd), United Kingdom
Beneficiaries	Aberdeen City Council, Birmingham City Council, Dundee City Council, EE Energy Engineers GmbH, Element Energy Ltd, ERM France, ESWE Verkehrsgesellschaft MBH, EUE APS, Fondazione Bruno Kessler, Gelderland, Herning Kommune, HyCologne – Wasserstoff Region Rheinland EV, Hydrogen Europe, hySOLUTIONS GmbH, In-Der-City-Bus GmbH, Latvijas Ūdeņraža Asociācija, London Bus Services Ltd, Mainzer Verkehrsgesellschaft mbH, Planet Planungsgruppe Energie und Technik GbR, RebelGroup Advisory BV, Regionalverkehr Köln GmbH, Rigas Satiksme SIA, Societa Autobus Servizi d'Area SpA, Sphera Solutions GmbH, Südtiroler Transportstrukturen AG, Trentino Trasporti SpA, Union Internationale des Transports Publics, Verkehrs-Verbund Mainz-Wiesbaden GmbH, West Midlands Travel Ltd, WSW mobil GmbH

https://www.fuelcellbuses.eu/projects/jive

PROJECT AND GENERAL OBJECTIVES

The JIVE project exists to assist the commercialisation of fuel cell buses (FCBs) as a zero-emission public transport option across Europe. The project aims to address the current high ownership cost of FCBs relative to conventionally powered buses, and the lack of hydrogen refuelling infrastructure across Europe, by supporting the deployment of 131 FCBs in seven locations. This will more than double the number of FCBs currently operating in Europe.

NON-QUANTITATIVE OBJECTIVES

- JIVE aims to demonstrate the suitability and provide experience of FCBs for wider roll-out. Through the publication of project deliverables such as a best practice and commercialisation report, information flows to interested observer parties have been established.
- The project aims to raise awareness of the readiness of fuel cell technology for wider roll-out, with a focus on bus purchasers and regulators. A strong observer group within the JIVE consortium has been established. This group monitors discussions and best practices emerging from the project. This will ensure that the momentum of FCB uptake in Europe continues beyond the project.
- JIVE aims to deliver positive environmental impacts by operating FCBs for extended periods. As per the project's objectives, all buses deployed thus far in the project are replacing diesel technology. This means that the buses will lead to CO_2 abatement and will not simply operate as a visible extra.

PROGRESS AND MAIN ACHIEVEMENTS

- By October 2023, 100 % of buses had started operating in seven cities and four countries. The vehicles represent models from four European bus manufacturers.
- By the end of 2023, the JIVE FCBs had travelled 9 128 925 km across all deployment sites.
- Fuel cells have been operating for a total of 384 555 hours.
- Across all the project's hydrogen refuelling stations, 892 132 kg of hydrogen has been dispensed across 52 677 fills. Please note that the kilograms of hydrogen dispensed and the number of fills include the Cologne and Wuppertal sites, which are involved in both JIVE and Joint initiative for hydrogen vehicles across Europe 2 (JIVE 2).

FUTURE STEPS AND PLANS

- All buses are expected to be operational.
- To date, only one city does not yet have operational buses.
- Uncertainties around ongoing issues related to hydrogen supply (undelivered hydrogen, hydrogen prices, etc.) are expected to be clarified in the upcoming period to ensure that all buses are fully in service.
- By the end of the project, it is expected that the total distance travelled will be 10 683 714 km.
- The total number of fuel cell hours by the end of the project is expected to be 414 253.
- Hydrogen refuelling stations involved in JIVE are projected to dispense 1 055 089 kg of hydrogen across 61 898 individual fills.

PROJECT TARGETS

Target source	Parameter	Unit	Target	Achieved to date by the project	Target achieved?
Project's own objectives	Vehicle operational lifetime	years	8	N/A	
	Distance travelled	km/year	> 44 000	N/A	
	Availability	%	> 90	85.1	⚙
	MDBF	km	> 2 500	N/A	
	Efficiency	%	> 42	N/A	
	Vehicle OPEX	€	≤ 100 % more than diesel bus OPEX	N/A	
	Operating hours per fuel cell system	hours	> 20 000	N/A	✓
	Specific fuel consumption	kg / 100 km	< 9.0	7.56	
	Vehicle CAPEX	€	< 650 000	N/A	

Clean Hydrogen Partnership
Co-funded by the European Union