

JIVE 2

JOINT INITIATIVE FOR HYDROGEN VEHICLES ACROSS EUROPE 2



Project ID	779563
PRR 2025	Pillar 3 - H ₂ End Uses - Transport
Call Topic	FCH-01-5-2017
Project Total Costs	86 926 760.59
Clean H ₂ JU Max. Contribution	25 000 000.00
Project Period	01-01-2018 - 30-06-2025
Coordinator Beneficiary	ENVIRONMENTAL RESOURCES MANAGEMENT LIMITED, UK
Beneficiaries	ELEMENT ENERGY, ZEROBUS OU, ERM FRANCE, ERM FRANCE, TRANSEDEV OCCITANIE OUEST, HYPORT, OBCINA SOSTANJ, ENGIE ENERGIE SERVICES, CA DE L'AUXEROIS, CONNEXION VLOOT BV, RHEINISCHE BAHNGESSELLSCHAFT AKTIENGESELLSCHAFT, SOCIETE PUBLIQUE LOCALE D'EXPLOITATION DES TRANSPORTS PUBLICS ET DES SERVICES A LA MOBILITE DE L'AGGLOMERATION PALOISE, STRAETO BS, TWYNSTRA GUDE MOBILITEIT and INFRASTRUCTUUR BV, OPENBAAR LICHAAM OV-BUREAU GRONINGEN EN DRENTHE, PAU BEARN PYRENEES MOBILITES, LANDSTINGET GAVLEBORG, REBELGROUP ADVISORY BV, REGIONALVERKEHR KOLN GMBH, DUNDEE CITY COUNCIL, CONNEXION OPENBAAR VERVOER NV, MESSER SE and CO. KGAA, WSW MOBIL GMBH, RIGAS PASVALDIBAS SABIEDRIBA AR IEROBEZOTU ATBILDIBU RIGAS SATIKSME, MESTNA OBCINA VELENJE, KOLDING KOMMUNE, EE ENERGY ENGINEERS GMBH, TRANSPORTS DE BARCELONA SA, SPHERA SOLUTIONS GMBH, BRIGHTON and HOVE BUS AND COACH COMPANY LIMITED, RUTER AS, Provincie Zuid-Holland, PETROGAL SA, VATGAS SVERIGE IDEELL FORENING, ELEMENT ENERGY LIMITED, NOORD-BRABANT PROVINCIE, UNION INTERNATIONALE DES TRANSPORTS PUBLICS, HYDROGEN EUROPE

PROJECT AND GENERAL OBJECTIVES

The JIVE 2 project aims to deploy 160 fuel cell buses (FCBs) in eleven locations - Auxerre (FR), Barcelona (ES), Brighton/Crawley (UK), Cologne (DE), Emmen (NL), Groningen (NL), Jelgava (LV), Pau (FR), South Holland (NL), Toulouse (FR), Wuppertal (DE). Combined with its sister project, JIVE 2, nearly 300 fuel cell buses will be deployed at sixteen sites by 2025 - the largest deployment in Europe to date.

NON-QUANTITATIVE OBJECTIVES

- JIVE 2 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.
- JIVE 2 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, to monitor discussions and best practices emerging from the project. This will ensure continuation of the momentum for FCB uptake in Europe continues beyond the project.

- JIVE 2 aims to deliver positive environmental impacts by operating FCBs for extended periods. As per the project's objective, all buses deployed thus far in the project are replacing diesel technology. This means that the buses will lead to CO₂ abatement and will not simply operate as a 'visible extra'.

PROGRESS, MAIN ACHIEVEMENTS AND RESULTS

- To date, all 160 buses have been ordered.
- To date, 150 buses have been delivered and 124 are operational.
- 12 599 637 km travelled by the buses deployed through JIVE 2.
- Average travel distance per bus of 38 521 km/year/ bus until December 2024. Excluding 2020, the average travel distance was 44 925 km/year/bus.
- One site has been operating its FCBs for over three years.
- One site (Jelgava) has joined as a demonstration site following the successful completion of one of the FCB Roadshows under the project's "Stimulating Further Demand".



<https://www.fuelcellbuses.eu/>



- Expansion of hydrogen infrastructure in the partner regions, alongside stimulation of future growth of the hydrogen refuelling station network and FCB fleets.
- Successful large-scale dissemination activities promoting the project and hydrogen technology across Europe and around the world (FCB Roadshows, participation in conferences and events - such as the Hydrogen Week, November 18-22 at Brussels Expo, participation in public dissemination events such as Hydrogen Solutions for European Cities: Learnings from JIVE II and REVIVE for Future Buses and Trucks workshop in November 2024).

FUTURE STEPS AND PLANS

- Continued operation of the buses until the end of the project.
- Final buses enter operation: Brighton/Crawley and Jelgava.
- Final dissemination activities such as the 4th and final roadshow in the Nordic countries, specifically Sweden and Finland.
- Project knowledge will be preserved through a digital archive, speaker briefs for consortium members and a short video showcasing the JIVE projects.

PROJECT TARGETS

Target source	Parameter	Unit	Target	Achieved to date by the project	Target achieved?
Project's own objectives	Vehicle operational lifetime	years	8	-	⚙️
	Distance travelled	km/year/bus	>50 000	38 521 km/year/bus project to date (all years) / 44 925 km/year/bus project to date, excludes 2024 (data only available until June 2023)	
	Operating hours per fuel cell system	hours/bus	> 20 000	10 367	
	Availability	%	>90	83.6	
	Efficiency	%	> 42	-	✓
	Specific fuel consumption	kg/100km/bus	< 9.0	7.4	
	Vehicle CAPEX	€	<625 000	-	
	Vehicle OPEX	€	max. 100% more than diesel bus OPEX	-	
	Mean time (distance) between failures (MDBF)	km/bus	> 3 500	24 913	