Europe's largest fuel cell bus project, JIVE 2, has concluded, marking an important milestone in the deployment of hydrogen buses

Brussels, Belgium — 30 June 2025 – The Joint Initiative for hydrogen Vehicles across Europe 2 (JIVE 2), has now come to an end. Following previous European projects including CHIC, 3Emotion and JIVE, JIVE 2 enabled the deployment of a further 160 hydrogen fuel cell buses in Germany, France, the Netherlands, Spain, Latvia, and the United Kingdom, marking a significant step towards securing CO_2 free urban public transport. Combined, the JIVE and JIVE 2 projects, that started respectively in 2017 and 2018, have deployed around 290 FCBs at 16 sites across Europe– the largest such deployment in Europe to date.

Co-funded by the Clean Hydrogen Partnership, the JIVE 2 project has achieved key milestones such as:

- **Increased manufacturer participation**: At the project's inception, few suppliers offered fuel cell buses. Today, multiple models from various manufacturers are available.
- **Deployment of various FCB models:** Alongside the standard 12 m buses, a total of 7 articulated buses were deployed across Barcelona and Pau. In Brighton, UK, a large fleet of double decker buses were deployed.

Articulated	4%	7
Single decker	69%	142
Double decker	27%	11
Total	**100%**	**160**

- **Bus price reduction**: The target price of €625,000 for a standard 12m bus and of €1 million for articulated hydrogen fuel cell bus was achieved across all sites.
- **Successful range performance:** The buses demonstrated a consistent range of up to 500 kilometres in diverse climate conditions, proving their reliability and flexibility.
- **Improved fuel efficiency**: Original targets for fuel consumption were surpassed, with the overall average consumption for 12m buses being 7.7 kg H_2/100km and for articulated buses being 8.9 kg H_2/100 km.
- **Long-term commercial arrangements**: Agreements with bus and hydrogen fuel suppliers were established for operations extending up to ten years, laying the groundwork for long-term and large-scale future deployments.
- **Extensive knowledge sharing and external stakeholder engagements**: The project disseminated results through site visits, publications, presentations, the organisation of five Zero Emission Bus Conferences, demand aggregation workshops, and bus user group meetings.
- **CEE and Nordic countries roadshow**: In total, the JIVE projects have organised four roadshows which have covered 35 cities in 15 Central and Eastern European and Nordic countries, hosting national workshops in each country, presentations, and demonstrations. These four roadshows served to stimulate the future deployment of FCBs in a wider range of regions across Europe. Roadshow events have been attended by approximately over 2,000, including PTOs/PTAs, policymakers, industry associations, and media.

Despite encountering a range of challenges, including those mentioned below, the JIVE 2 project has produced important learnings and steps forward for the sector. A comprehensive audit of these learnings has been captured in the project's "Best Practice Report 2024." [1]

- **HRS reliability and hydrogen supply**: Reliability challenges in HRSs have impacted the availability and business case of FCBs. In addition, the supply of hydrogen at many sites was unstable, rendering refuelling stations unavailable.
- **Hydrogen price**: Instability in the energy market in 2022 elevated hydrogen prices. High energy prices continue to impact hydrogen production, resulting in unaffordable green hydrogen prices without government support. Some JIVE 2 partners managed to mitigate the impact thanks to long-term fixed hydrogen supply contracts established at the start of their deployment projects while others reviewed their production strategies to produce hydrogen only during off peak hours.
- **Availability of spare parts:** Long lead times and low stocks of spare parts challenges the operations of FCBs and HRSs. Best practices from operators' experience in the JIVE projects includes the importance of backup refuelling options, the necessity of having technical support from original equipment manufacturers (OEMs) onsite during early stages, maintaining a stock of critical spare parts and ensuring frequent and early communications with OEMs.

The JIVE projects have delivered valuable lessons for the future of zero-emission bus deployment, with key results and resources available on the project website [https://fuelcellbuses.eu/]. A major takeaway is the importance of early and ongoing engagement with stakeholders throughout development, permitting, procurement, and operations. Many of these insights, including studies on the potential for FCBs in Europe, best practices for HRS reliability, and experiences from JIVE and JIVE 2 project sites, will be shared at the *Zero Emission Bus Conference* on 7–9 October 2025 in Brussels. Join us to hear from the people making it happen: https://zebconference.eu/ !

"JIVE and JIVE 2 have been the flagship projects of the Clean Hydrogen Joint Undertaking for deploying fuel cell buses. Their impact extends beyond demonstrating bus operability and improving fuel economy and capital costs over years of operation.

Notably, these projects have significantly advanced public outreach, particularly through roadshows across Europe, with a strong focus on Central Europe, the Baltics, the Balkans, and Scandinavia. As a result, we are now witnessing a growing adoption of hydrogen mobility solutions in these regions—one of the most significant contributions of JIVE and JIVE 2." Said ***Luca Feola. JIVE 2 Project Officer – Clean Hydrogen Joint Undertaking.***

"The JIVE 2 project now concludes as one of the major contributions towards advancing Europe's fuel cell bus sector. Many lessons have been learnt over the 8 years of the JIVE initiatives, all highly relevant for public transport authorities, operators, and other stakeholders with an interest in hydrogen in mobility applications. I would like to thank all the partners for their work and involvement on this journey with us. We are also extremely grateful to the Clean Hydrogen Partnership for their support and flexibility throughout. The JIVE projects combined have been a significant milestone in the fuel cell bus industry, increasing the number of buses in Europe from a handful to hundreds. We look forward to continuing this journey." added **Alex Stewart, Partner, ERM.**

1 The full report, plus a more accessible disaggregated version, can be found at https://fuelcellbuses.eu/category/starting-your-fcb-project

About JIVE/JIVE 2

The JIVE and JIVE2 projects are financed by the Clean Hydrogen Joint Undertaking under grant agreements no. 735582 and 779563. The Clean Hydrogen Undertaking receives support from the European Union's research and innovation programs Horizon 2020, Hydrogen Europe, and Hydrogen Europe Research.

The JIVE and JIVE2 projects, which started in January 2017 and January 2018, respectively, will deploy approx. 300 zero-emission fuel cell buses and associated infrastructure (under the MEHRLIN project) in 16 European cities and regions by the first half of the 2020s, which represents the largest implementation in Europe so far. The buses will be deployed in cities and regions in France, Germany, Italy, the Netherlands, Spain, and the United Kingdom.

Find out more about the project activities on the project website (fuelcellbuses.eu), also on Twitter, LinkedIn and Instagram pages.

About the Clean Hydrogen Partnership:

The Clean Hydrogen Partnership is supporting research and innovation (R&I) activities in hydrogen technologies in Europe. It aims to accelerate the development of advanced clean hydrogen applications ready for market, across end-use sectors such as energy, transport, building and industry, while strengthening the competitiveness of the clean hydrogen value chain. The members of the partnership are the European Commission, fuel cell and hydrogen industries represented by Hydrogen Europe and the research community represented by Hydrogen Europe Research.

For more information, please visit www.clean-hydrogen.europa.eu.

JIVE 2 H2 ZERO EMISSION

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