



FlexCHES

Flexibility services based on Connected and interoperable
Hybrid Energy Storage System

2026, April

FlexCHES pilot demonstrations across five European sites

From an island grid in Türkiye to energy communities in Spain, FlexCHES tested its flexibility solutions in real-life conditions across the continent.

The FlexCHES consortium has deployed and validated its open flexibility platform and connected storage solutions at five pilot sites that span very different energy contexts and user behaviours across Europe.

The five demonstrations were designed to test the scalability and replicability of the project's Virtual Energy Storage System concept under diverse real-world conditions:

- United Kingdom — within the FLEXIS demonstration area in South Wales, focusing on flexibility from industrial and large-scale assets.
- Slovenia — an electric-vehicle community pilot operated by the distribution system operator Elektro Ljubljana, aggregating charging infrastructure and flexible grid nodes.
- Spain — a renewable energy community in Bullas, Murcia, engaging residential prosumers with photovoltaic generation, storage and heat pumps, led by La Solar and MIWenergia.
- Italy — multi-functional buildings in Turin, where IREN tested centralised heat pumps, EV charging and a rooftop solar system with battery storage as sources of flexibility.
- Türkiye — the island of Gökçeada, where UEDAS used a connected storage node to improve the stability of an island grid.

Each pilot combined real and emulated assets, connected through the FlexPlatform, to demonstrate how distributed resources can provide flexibility services to the grid while delivering value to participants. Results from the demonstrations fed into the project's socio-economic and environmental assessment and its comparative studies on replicability.

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Demonstrating in real conditions was central to the project's approach. Each pilot reflected a different slice of Europe's energy reality, allowing FlexCHES to test how its tools cope with different regulations, climates, assets and user behaviours. The results covering technical performance, user acceptance, and socio-economic and environmental impact were shared with the wider community through the European Commission's BRIDGE initiative, which connects Horizon Europe smart-grid, storage and digitalisation projects.

"The real test of any energy innovation is whether it works beyond the laboratory. By demonstrating across five very different sites — from an island grid in Türkiye to energy communities in Spain we are showing that our flexibility solutions can adapt to the diverse conditions in which Europeans actually live and work."

Dr Xun Jiang, Scientific & Technical Manager, Cardiff University

To ensure that local stakeholders and citizens were at the heart of the process, FlexCHES established Open Living Labs around the pilot sites, bringing together public authorities, energy community representatives and end-users in a user-centric, open-innovation setting.

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FlexCHES project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement No 101096946. This publication reflects only the author's view, and the EC is not responsible for any use that may be made of the information it contains.



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