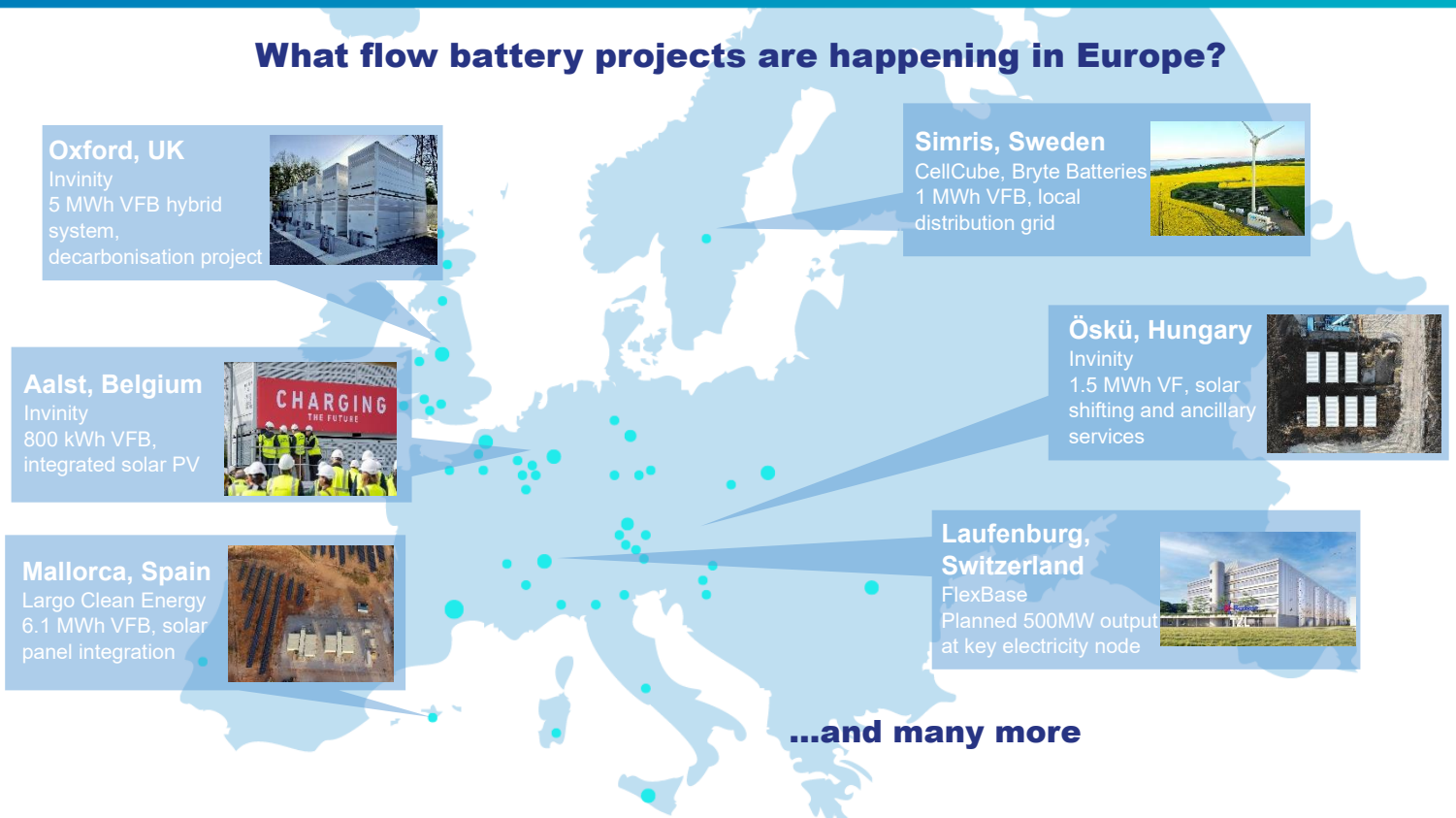
FLOW BATTERIES EUROPE
A united voice for flow batteries

The International Flow Battery Forum™

Flow Batteries in Europe

The 40th Anniversary of the Vandium Flow Battery

What flow battery projects are happening in Europe?



Oxford, UK
Invinity
5 MWh VFB hybrid system, decarbonisation project

Simris, Sweden
CellCube, Bryte Batteries
1 MWh VFB, local distribution grid

Öskü, Hungary
Invinity
1.5 MWh VF, solar shifting and ancillary services

Aalst, Belgium
Invinity
800 kWh VFB, integrated solar PV

Mallorca, Spain
Largo Clean Energy
6.1 MWh VFB, solar panel integration

Laufenburg, Switzerland
FlexBase
Planned 500MW output at key electricity node

...and many more

The growing need for flow batteries in Europe

As Europe pushes towards its 2050 climate neutrality goals, energy storage is vital to address the intermittency of renewables. Flow batteries, with their long-duration storage capabilities, are well-suited to support Europe's renewable energy ambitions by offering reliable, flexible, and scalable solutions.

Decarbonization and climate neutrality goals: Europe's commitment to a sustainable future has led to an increasing reliance on renewable energy sources. At least 42.5% of the EU's energy must come from renewables by 2030. Hence, political goals will play an important role in integrating energy storage systems.

Energy storage projections: The European energy storage capacity is projected to undergo significant growth, expected to exceed 200 GW of energy storage capacity by 2030, reaching 600 GW by 2050. This will also affect its flow battery market, with a CAGR of approximately 18-19% between 2023 and 2030.

Advancements in grid resilience and flexibility: A greener energy system requires a resilient and flexible grid. Flow batteries not only play an important role in balancing the variability of renewable energy, particularly in the light of growing energy demands, but will be crucial to enhance Europe's energy independence and security

Policy insights: how flow batteries are regulated in the EU

To achieve its ambitious climate goals, the EU has adopted a comprehensive policy framework under the European Green Deal, in place since 2019. Energy is a central pillar, with numerous initiatives developed to create a sustainable energy system. Many of these initiatives directly support the role of flow batteries in enabling long-duration energy storage and grid decarbonisation.

EU Batteries Regulation

The Regulation is in force since August 2023. It is the first piece of European legislation taking a full life-cycle approach in which sourcing, manufacturing, use and recycling are addressed in a single law. Hence, it covers the full value chain of elective vehicle, light means of transport, and industrial batteries. Secondary legislation will be adopted over the coming years, with implications for flow batteries as well. This includes carbon footprint requirements, a 'Battery Passport', performance and durability standards, recycling targets, reporting obligations and more.

The Working Group on Carbon Footprint Calculation for Flow Batteries

Flow batteries placed on the European market must have a Carbon Footprint Declaration from 2030 onwards. In response, FBE is launching a working group to develop a CO2 footprint calculation methodology for flow batteries.

Objectives of the project:

- **Influence**: to co-create the final carbon footprint calculation rules for flow batteries.
- **Collaborate**: to work with industry stakeholders to ensure the methodology meets requirements and is rigorously tested.
- **Prepare businesses**: to equip companies with necessary skills essential for future carbon footprint calculations.

Contact b.virsumirska@flowbatterieseurope.eu for more information and to join the project!

Electricity Market Design reform

The Electricity Market Design (EMD) reform entered into force in July 2024. The increasing deployment of renewables requires flexibility solutions to ensure their smooth integration into the grid. To promote non-fossil flexibility, bi-annual assessments of flexibility needs will be conducted at both national and European levels, using input from TSOs and DSOs, along with a common European methodology. If national non-fossil flexibility objectives are not achieved through market mechanisms alone, Member States may introduce support schemes to encourage flexibility.

To support the EU Member States in assessing their flexibility needs, the EU is working on the most practical and applicable way to do this. The level of investment by EU countries in different energy storage technologies will also depend on this.

Net-Zero Industry Act and PFAS Restriction Proposal

The Net-Zero Industry Act (NZIA), in force since June 2024, is a EU response to the U.S. Inflation Reduction Act (IRA). It sets a target for the EU to achieve 40% domestic production capacity for strategic net-zero technologies, including batteries, by 2030. However, investment challenges arise as 19 different technologies compete for funding, potentially leaving some underfunded.

In parallel, the EU is considering a ban on per- and polyfluoroalkyl substances (PFAS), also known as "forever chemicals." This presents a challenge for flow batteries, particularly vanadium flow batteries, which often rely on fluoropolymers. A ban without alternatives or a derogation period could significantly impede the green transition.

Challenges and opportunities in the European flow battery sector

Challenges

- **Supply chain vulnerabilities**
  Dependency on critical materials and potential restrictions
- **Investment gaps**
  Need for increased funding and support for flow battery projects at the European level
- **Scalability**
  Need for cost reductions and technological improvements to scale up production
- **Developing Business Case**
  Importance of creating a compelling business case to attract investors and stakeholders to flow battery initiatives

Opportunities

- **Energy transition support**
  Integral role in Europe's renewable energy and decarbonisation goals
- **Need for storage capacity**
  Significant growth potential due to increase of RES
- **Innovative solutions**
  Potential for advancements in efficiency, recycling, and cost-effectiveness
- **Specific Applications for Flow Batteries**
  Technology's safety, durability, and sustainability is well-suited for various applications in Europe

Get in touch!

Flow Batteries Europe (FBE)

FBE is a members-led trade association based in Brussels representing flow battery stakeholder at European level. The aim is to advance R&D, commercialisation and deployment of flow batteries in Europe. To achieve this, FBE is working proactively to ensure that the interests of the sector are appropriately reflected in policy. Hence, the Secretariat engages in targeted advocacy activities and acts in close collaboration with European policymakers.

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International Flow Battery Forum (IFBF)

The IFBF is the leading event for the flow battery community, gathering over 300 flow battery business leaders, researchers and policymakers in a yearly conference. The event promotes the most recent developments in science and technology, as well as the commercialisation of flow batteries. The next IFBF takes place from 24-26 June 2025 in Vienna, Austria.

IFBF

Anthony Price
Secretary General at Flow Batteries Europe
Director at International Flow Battery Forum
price@swanbarton.com
www.flowbatterieseurope.eu | www.flowbatteryforum.com