

Case Study: PowSyBI

A Community-Led Open Source Project for European Grid Sovereignty

OVERVIEW

PowSyBI (Power System Blocks) is an open source library for power system modeling, visualization, and simulation. It enables transmission system operators (TSOs), regional coordination centres (RCCs), and other stakeholders to build advanced grid analysis tools tailored to their specific needs. Written in Java, PowSyBI supports a modular, plugin-based architecture – allowing developers to customize and extend its capabilities. Use cases include load flow, dynamic and short-circuit simulations, CGMES data import/export, network visualisation, and more.

Initially developed by RTE, PowSyBI was open sourced in 2019 under Linux Foundation Energy (LF Energy), and now serves a wide range of users across Europe. In 2025, the project transitioned to be hosted under Linux Foundation Europe (LF Europe), in continued partnership with LF Energy, to support its next phase of growth

As said by **Gabriele Columbro**,
General Manager, Linux
Foundation Europe:

“PowSyBI reflects how open source can serve as a strategic lever for Europe's digital sovereignty. By joining LF Europe, the project is reinforcing a collective commitment to building digital public goods that underpin our energy infrastructure. This is not just about collaboration – it's about shaping a future where Europe leads in openness, resilience and technological autonomy.”

THE CHALLENGE

SCALING TRUST AND COLLABORATION IN A MULTI-STAKEHOLDER ENVIRONMENT

The European energy sector is rapidly digitizing and facing urgent demands: greater cross-border coordination, transparency, and a shift toward sovereign control over digital assets. Like many infrastructure domains, grid operators face a false binary: build proprietary tools from scratch or remain dependent on expensive vendor licenses.

PowSyBI Community Contributor

“Build together now, thanks to open source. Stop paying individually for what we all need.”

In this landscape, open source presents a third way: shared investment in high-quality, flexible, and sovereign technology.

But building open source in the utility sector isn't easy. PowSyBI needed:

- **Neutral governance and credibility**
- **A stronger European identity to align with regulatory priorities**
- **Community infrastructure that enables broader participation**

THE SOLUTION

LF EUROPE AS A HOME FOR EUROPEAN GRID INNOVATION

PowSyBI's move to LF Europe reflects a strategic effort to align the project more closely with European values, digital sovereignty goals, and EU-based collaboration.

Boris Dolley, RTE OSPO Lead

“An LF Europe affiliation helps increase trust and visibility. Europe has underspent on digital infrastructure for years – we need to build digital capital, and open source enables that.”

LF Europe provides the PowSyBI community with:

- **A neutral and trusted home for public-private collaboration**
- **Visibility within European research and regulatory frameworks**
- **Support for compliance with EU regulations (e.g., Cyber Resilience Act)**
- **Access to broader communities working on open source for critical infrastructure**

RESULTS

A GROWING, DISTRIBUTED COMMUNITY WITH SHARED PURPOSE

Today, PowSyBI has become a cornerstone of Europe's energy system. It is now actively used by Transmission System Operators such as RTE and Elia; by Regional Coordination Centers including [Baltic RCC](#), [CORESO](#), TSCNET, and SeleneCC; by vendors like [Artelys](#), AIA, and Power Info; and by research institutions such as CRESYM and NEON Research.

Its open, modular design enables production-grade applications. Baltic RCC relies on PowSyBI for operational grid security studies, while SeleneCC has deployed it at the heart of its European Merging Function implementation. Perhaps most striking is the CorNet program, a joint initiative of CORESO and TSCNET to build a pan-European coordination platform for more than 30 TSOs. Within CorNet, Artelys and RTE have contributed modules based on PowSyBI Open Load Flow, Cost Sharing, and OpenRAO to support critical processes such as the Merging Function, Security Analysis, and Remedial Action Optimization. In December 2024, CorNet reached a major milestone: the successful go-live of the European Merging Function, which consolidated individual grid models from every TSO into a unified Common Grid Model. This achievement significantly enhanced the efficiency and security of Europe's power grid.

These results show the value of a shared, open source foundation. PowSyBI enables reproducible and customizable analysis pipelines that scale to networks of more than 120,000 nodes and thousands of contingencies processed in minutes. Its service-based, modular approach allows costs and maintenance to be shared across operators, while preventing vendor lock-in and encouraging a sustainable ecosystem of European IT providers.

This success demonstrates how open source can deliver not only technical excellence but also strategic autonomy. It is proof that Europe can build and sustain critical digital infrastructure through collaborative innovation.

Sophie Frasnado, PowSyBI
Project Manager

“PowSyBI is used by several TSOs and RCCs. We stay in touch through Slack, TSC meetings, and events like LF Energy Summits. Slack is very effective – it helps us stay engaged.”

The community continues to grow through:

- **Regular TSC meetings**
- **Slack collaboration and support**
- **Outreach via events, webinars, and documentation**

Sophie Frasnedo, PowSyBI
Project Manager

“Documentation is key. We regularly try to improve it to attract and keep users.”

WHY IT MATTERS

DIGITAL SOVEREIGNTY THROUGH OPEN SOURCE

PowSyBI illustrates what’s possible when stakeholders collaborate instead of duplicating effort. By investing in shared infrastructure, TSOs and RCCs across Europe avoid vendor lock-in, improve interoperability, and retain control over core technologies.

From ‘Open Source: The Key to
Utility Digital Sovereignty’ by Alex
Thornton (LF Energy)

“Open source allows us to share the burden of creating fundamental technology assets. These shared components can then be customized to meet individual requirements.”

Nicolas Omont,
VP Operations,
Artelys

“The open-source nature of PowSyBI offers organizations unprecedented control and flexibility over their grid computation modules. As a dedicated service provider and center of expertise, Artelys enables its clients to fully leverage this advantage.”

Advice to Others

“Join LF Europe—and make sure you promote why you did it.”
“We spend so much on digital commodities through license fees. Open source will help produce critical digital European champions.”

LOOKING AHEAD

As European regulatory and market frameworks evolve, PowSyBI’s modular foundation and LF Europe affiliation position it to scale. Whether through tighter integration with new simulation needs, collaborations with research consortia, or more active TSO/RCC participation, the project is now on a clearer, sovereign-aligned growth path.

PowSyBI exemplifies how open source can serve not just as a tool, but also as a strategic pillar for European infrastructure.

[Learn more about PowSyBI](#)

[Explore the benefits of hosting your project at Linux Foundation Europe](#)