omega-x

Orchestrating an interoperable sovereign federated Multi-vector Energy Data Space built on open standards and ready for GAia-X

MOTIVATION

Large amounts of valuable data are available in energy systems but are often underused. There is no single data platform, for example, connecting data from the generation, transmission, distribution and consumption domains in Europe's electricity sector or across the various energy vectors – electricity, gas, heat, etc. The barriers also imply the lack of proper mechanisms and policies that ensure secure, sovereign and fair data sharing.

OBJECTIVE

Relying on European common standards, the EU-funded OMEGA-X project aims to implement an energy data space. This will include federated infrastructure, data marketplace and service marketplace, involving data sharing between different stakeholders and demonstrating its value for concrete energy use cases while guaranteeing scalability and interoperability with other data space initiatives.

CONCEPT

The proposed concept and architecture heavily rely on the approaches adopted by both IDSA (International Data Space Association) and Gaia-X, as major EU references regarding Data Spaces, including also additional references such as FIWARE, BDVA/DAIRO and SGAM (purely on the energy). The primary goal of its reference architecture relies on deriving appropriate requirements for a sound, secured and trusted data trading.

Main Results

omega-x

IDSA

Service Marketplace

Data Marketplace

Fede | rated | Infr.

OMEGA-X summary of results and demonstration.

Demonstration

4 Business Use case families

- 9 pilot sites. 6 countries
- 34+ services (10+ new)
- 13 service providers
- 14 data providers

40+ datasets, 50 GB average

USE CASES

The OMEGA-X project includes setting up 4 use case families that will showcase the value of having a common data space for a particular problem identified by energy stakeholders:

- **Renewables**: Having renewable plant owners and service providers to optimize operation and maintenance to increase renewable energy sources (RES) availability and reducing CO_2 footprint.
- **Local Energy Communities**: Exploiting data from different energy vectors to optimize the overall performance of a local community, instead of optimizing each vector individually.

- Collaboration among **Electromobility** actors: Demonstrating how data sharing can ease and scale up services such as booking and building innovative services such as cross-border self-consumption of renewable energy. It will involve the electricity system from charging points to transmission system operators (TSOs) in different EU countries.
- **Flexibility**: Aiming to demonstrate the performance upgrade that can be achieved for the flexibility identification and provision at local/municipality level when service providers can have access to extended data sets from multiple origins.

🟢 Renewables

3 pilots sites. 2 countries (Spain, France)
7 partners involved (3 data owners, 4 service providers)
Intra-pilot: O&M and smart grid data-driven services
Inter-pilot: Benchmarking and synthetic data generation

🔵 Local Energy Communities

4 pilot sites. 4 countries (Spain, Italy, Serbia, Portugal)
9 partners involved (5 data owners, 5 service providers)
Intra-pilot: multi-vector optimization/planning. Engagement
Inter-pilot: Benchmarking

🟠 Electromobility

1 pilot site. 2 countries (Belgium, France)
5 partners involved (3 data owners, 2 service providers)
Intra-pilot: Roaming of EV charge booking services
Inter-pilot: TSO-DSO collaboration

🟣 Flexibility

1 pilot site. 1 country (Portugal)
5 partners involved (3 data owners, 2 service providers)
Intra-pilot: Advanced data-driven flexibility

IMPACT

OMEGA-X will develop an Energy Data Space that enables multiple actors sharing data and services while ensuring privacy, security and sovereignty. This will specifically address the current problem of low availability of data for innovative uses in the energy sector and beyond. OMEGA-X will collaborate with stakeholders to identify where energy-based service improvements and innovation are required, and how OMEGA-X could potentially be used and adopted to address these needs:

1. This will guarantee that companies and organizations can share their data safely. At the same time, it will help existing market actors (including SMEs and start-ups) to have access to a variety of datasets to improve their AI models, and thus be able

to upgrade existing services and/or bring innovative services that otherwise could not be developed.

2. The availability of data will empower new participants and market roles such as aggregators and local energy community managers. This will facilitate the large-scale penetration of renewables in the local grid without significant investments in grid infrastructure and will also create an opportunity for new business models to emerge.

3. OMEGA-X will put a prominent focus on developing and promoting inclusive and collaborative behaviours, which will lead to a multitude of societal and economic benefits, such as, an increase in energy autonomy and a reduction in CO_2 emissions.