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DEMO (2)



Greece 🔚





Locations in Eastern Finland, covering JSE's MV/LV distribution network, including 2 primary substations, ~420 secondary substations, and ~5900 customers.

Finland **H**

Technology

The Finnish demo integrates ABB's grid virtualized automation platform and Intelligent Electronic Devices (IEDs) to monitor and manage the MV/LV distribution network in real-time. Edge-cloud data exchange is enabled via industry-standard communication protocols like IEC 61850 and

Advanced connectivity through 5G and other hybrid solutions ensures low-latency transmission, supporting distributed grid intelligence and proactive asset management across the network.

HEDGE-IOT

Tools Involved

- ABB Edge Platform and SSC600 extensions
- Real-time CM service (IEC61850-based) and anomaly detection modules
- Eclipse Dataspace Connectors and Interoperable Middleware for secure multi-party data sharing



Integration of DERs and edge intelligence for resilience

Kev Use Cases

DSOs benefiting from enhanced observability,

Target Audience/Beneficiaries

Distributed grid monitoring and asset management

Congestion management and grid flexibility

Real-time data sharing across stakeholders

- automation, and grid reliability Grid Operators and technical partners using
- real-time data for advanced grid analytics Energy service providers leveraging flexible
- data sharing for added-value services Consumers indirectly benefiting from improved quality of service and fewer outages



Partners involved



















DEMO (3)



Multiple locations across Northern and Central Italy, focusing on energy nmunities and low-voltage network flexibility management

01010

Italy 🔲

Technology

In Italy, the demo focuses on activating and managing flexibility by combining demand response strategies with forecasting tools based on localized weather data. IoT weather stations, sub-metering systems, and edge-based optimization algorithms for aggregators enable real-time prediction and control of energy flows.

The integration of distributed energy resources (DERs) into Areti's distribution grid supports a more resolient and efficient energy community model.

HEDGE-IoT

Tools Involved

- o IoT/Edge infrastructure and forecast algorithms
- Real-time analytics services for flexibility management O Semantic adapters and interoperability middleware
- O Visualization dashboards and UI for community engagement



Key Use Cases

- Predictive load and RES forecasting for improved flexibility
- Real-time grid monitoring to prevent congestion Integration of market signals for flexibility activation
- Improved decision support for community operators

Target Audience/Beneficiaries

- and real-time load balancing. **Energy Communities organized locally** with active prosumer participation.
- EV drivers through optimized charging and incentive mechanisms.
- Municipality and vulnerable citizens via access to surplus RES and energy poverty mitigation.



Partners involved









DEMO

Technology



(5)

The Portuguese demo revolves around the EdgeConnect platform, which enables real-time

(BEMS/EMS), smart meters, and PVs.

demand-side flexibility activation.

HEDGE-IoT

Tools Involved

and valorisation

with building and energy management systems

Semantic adapters and interoperable data layers

stakeholders while digital twins are used to model

flexible resources and predict system behavior. supporting multi-market participation and advanced

EdgeConnect platform for edge-cloud

EnergyBox for asset-level monitoring

Semantic interoperability connectors

for standardized data exchange

OptiFlex tool for flexibility asset scheduling

facilitate smooth communication between assets and

coordination of flexibility services through integration







Focused in Metropolitan Porto area, across commercial buildings, energy communities, and residential users.

Key Use Cases

- Activation and orchestration of demand-side flexibility across commercial and residential assets
 - Integration of multiple flexibility value chains (balancing,
 - Interoperable data exchange across actors via data space infrastructure
 - Intelligent forecasting and valorisation for grid and market-based services

Target Audience/Beneficiaries

- Energy communities and building managers participating in coordinated flexibility aggregation
- Commercial and industrial prosumers accessing value through dynamic flexibility valorisation
- DSOs and market operators integrating BEMS/EMS systems multi-market orchestrationinto
- Technology providers contributing with semantic adapters, forecasting tools, and digital twins



Partners involved













Technology

The Greek demo features a distributed AI-IoT architecture that connects smart meters, IoT-enabled PV systems, and V2G chargers across urban and regional settings.

Edge and cloud platforms are linked via interoperable middleware to ensure secure and real-time data exchanges among aggregators, DSOs, TSOs, and the energy market.

Federated and reinforcement learning models are applied to forecast flexibility, optimize demand response strategies, and enable dynamic participation in local flexibility markets.

HEDGE-IoT

Tools Involved

- O Interoperable middleware for secure market and grid interaction
- Federated Learning module for flexibility optimization
- O HEDGE-IoT Edge platform for submetering and real-time control O Local Flexibility Market (LFM) digital trading environment
- O IoT-enabled data governance framework based on IDS concepts

Partners involved







Primary activities in the Athens Metropolitan Area, with an additional

testing/replication site in Western Macedonia through CluBE.









Key Use Cases

across buildings

energy assets

via anomaly detection

Key Use Cases

and energy exchange

urban and rural contexts

for real-time response

new trading mechanisms

stability analysisd

Residential flexibility asset monitoring

Market-based activation of flexibility through LFM signals

Al-driven DR (Demand Response) using federated learning

Real-time interoperability among aggregator, DSO, TSO,

Integration of flexibility potential forecasting and grid

Demonstration of flexibility services scaling across

Target Audience/Beneficiaries

flexibility programs and submetering

Aggregators (PPC) deploying federated Al

DSOs/TSOs (HEDNO, IPTO) for accurate grid

state estimation and flexibility procurement

Energy market stakeholders (HEnEx) testing

Energy communities (CluBE) showcasing replicability across rural-urban divide

Residential consumers through demand-side



Monitoring and visualization of energy consumption

Semantic integration and alignment of distributed

Flexibility services through predictive optimization

Grid fault detection and predictive maintenance

Target Audience/Beneficiaries

Building managers and facility owners

shifting and flexibility trials

and flexibility

Key Use Cases

Real-time dynamic thermal and line rating

Asset lifetime extension through predictive analytics

Enhanced visibility of LV networks with edge sensors

Semantic data fusion for operational decision-making

Autonomous grid resilience management using Al

Target Audience/Beneficiaries

for enhanced grid monitoring

TSO using predictive and Al-based analytics

DSOs and operators benefiting from dynamic line

ratings and automated substation intelligence

Grid planners and engineers accessing detailed

Citizens and energy communities indirectly

benefiting through improved grid stability

semantic models and enhanced data integration

involved in energy efficiency projects

EV users and tenants interacting with

DSOs and service operators accessing

EMS and smart charging infrastructure

real-time insights for system balancing

Residential users participating in energy



Located in the Arnhems Buiten Business Park, Arnhem – a 17-hectare mixed-use area under development as an Energy Innovation Campus.

The Netherlands

Technology

The Dutch demo deploys smart meters, V2G charging stations, residential batteries, heat pumps, and solar PVs across 15 buildings. These assets are coordinated through Building and Energy Management Systems (BEMS/EMS) and enhanced with semantic adapters based on SAREF ontologies.

A Knowledge Engine and an edge-cloud IoT architecture allow seamless communication and control, enabling real-time energy optimization and flexibility operations at both the user and system level.

HEDGE-IoT Tools Involved

- O Knowledge Engine (KE) with explainable
- Al on SAREF data
- Semantic adapters and data pipelines O Data conversion pipelines into
- knowledge graphs Edge-based control, anomaly detection,

and scheduling tools



Partners involved







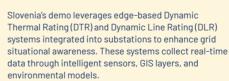


Located in Gorenjska region - including MV/LV substations and local DSO grid operated by Elektro Gorenjska

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Slovenia 🔤

Technology



Al-powered tools process this data to support predictive grid planning and automation while a unified semantic modeling layer ensures interoperability between heterogeneous data sources and grid components.

HEDGE-IOT

Tools Involved

- O PowerCIM semantic integration and mapping
- ML-based services for DER hosting capacity
- Edge analytics components for DTR/DLR execution Data exchange and monitoring platform
- for real-time grid status Secure interoperable middleware enabling cross-domain data flow

and grid forecasting











Partners involved

























