DEMO 2

Greece

Primary activities in the
Athens Metropolitan Area,
with an additional testing/replication site
in Western Macedonia through CluBE.

"Through HEDGE-IoT, we're building smarter bridges between households, aggregators, and grid operators as the Greek demo shows how digital tools can empower consumers to actively participate in energy markets while supporting a more flexible and resilient electricity system"

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.

Key Use Cases

- Residential flexibility asset monitoring
- Market-based activation of flexibility through LFM signals
- AI-driven DR (Demand Response) using federated learning
- Real-time interoperability among aggregator, DSO, TSO, and energy exchange
- Integration of flexibility potential forecasting and grid stability analysis
- Demonstration of flexibility services scaling across urban and rural contexts

HEDGE-IoT Tools Involved

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

Target Audience/Beneficiaries

- Residential consumers through demand-side flexibility programs and submetering
- Aggregators (PPC) deploying federated AI for real-time response
- DSOs/TSOs (HEDNO, IPTO) for accurate grid state estimation and flexibility procurement
- Energy market stakeholders (HEnEx) testing new trading mechanisms
- Energy communities (CluBE) showcasing replicability across rural-urban divide

Expected Outcomes

The Greek Demo sets out to show how smarter coordination between energy actors—like system operators, aggregators, and households—can lead to a more flexible and responsive grid. Through real-time data sharing and edge-based intelligence, it aims to make local energy systems better equipped to handle demand peaks and grid stress while also helping consumers lower their energy costs.

The demo is expected to increase participation in local flexibility markets, improve the accuracy of consumption and production forecasts, and make data exchange between systems more secure and seamless. Ultimately, success will be reflected in more efficient demand-side management, greater consumer involvement, and a grid that's better prepared for the challenges of a digital energy future

Partners involved