

International Energy Agency (IEA)
Technology Cooperation Programme (TCP)

International Smart Grid Action Network (ISGAN)

11th ISGAN Awards of Excellence

*Recognizing excellence in
smart grid projects around the world*

**Theme for 2025 ISGAN Awards:
Excellence in Solutions for Enhanced Grid Operations**

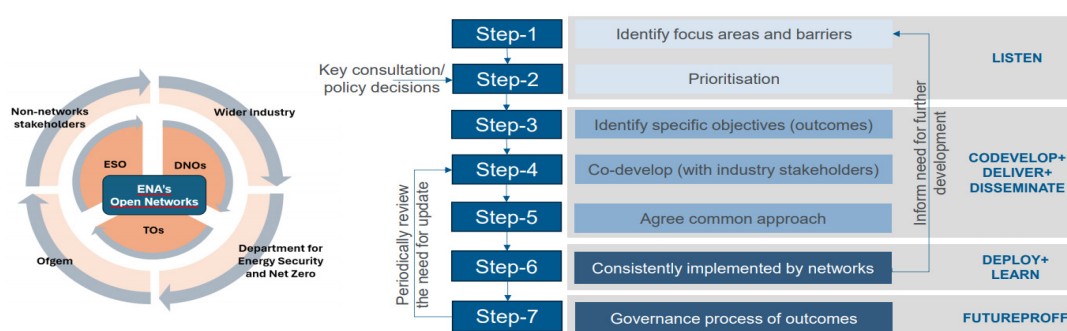


Project Location	London, Greater London, United Kingdom	
Project Period	2017-2025	
Lead Organisation	Energy Networks Association	

Project Background and Implementation

The Open Networks programme, launched in 2017 in response to the UK Government's Smart Systems and Flexibility Plan, brought together Great Britain's electricity distribution and transmission operators, the national system operator, gas networks, the Department for Energy Security and Net Zero, and Ofgem. It also engaged over 350 experts and organisations across industry, academia, local authorities, and consumer groups to drive collective progress toward net zero.

The programme follows a four-step approach: prioritising key enablers, co-developing solutions with stakeholders, deploying and learning through implementation, and future-proofing outcomes via governance or industry codes.



It has advanced in four phases: (1) 2017–18: defining future distribution system roles and pathways; (2) 2019–20, developed a robust nationwide business case and a commitment to flexibility through the formulation of neutral and transparent market principles; (3) 2020–22: developing and implementing technical specifications, institutional and operational processes, and transitioning the local flexibility market operation to business as usual; (4) 2023–25: improving market participation, transparency and coordination both between and across markets, followed by a transition to the new regulated entity, the market facilitator.

Both the UK Government (2021) and Ofgem (2023) highlighted Open Networks as a key driver of the UK's net zero transition and local flexibility market development.

Project Outcome and Key Messages

The Open Networks programme has driven Britain's transition to Distribution System Operation (DSO), enabling local network operators to manage supply, demand, and constraints more effectively. This required major advances in four areas: planning and network development, market and service optimisation, system operation and defence, and connections. Over 544 steps were implemented across independent regulated businesses, embedded into RIIO-ED2 (2023–28) business plans, making Britain the first to fully utilise local flexibility markets for connections.

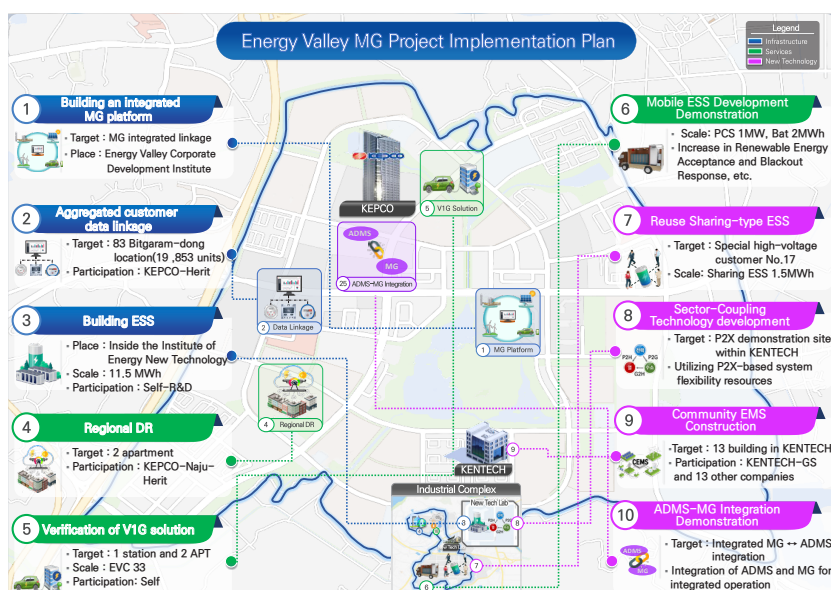
The results have been significant: ~£410m of avoided reinforcement costs (projected £1.12bn by 2028), ~£24m wholesale cost savings from renewable integration (projected £430m by 2028), and ~£4m efficiency gains from planning tools (projected £16m by 2028). More than 100,000 assets are now prequalified in the flexibility market.

Flexibility procurement has grown rapidly, with 2025 expected to double 2024 levels (6.4 GW tendered, 3.6 GW contracted). These achievements lay the foundation for the UK's clean power by 2030 goals and have inspired interest from countries such as Japan and the Netherlands. Key learnings are shared openly, including the 2025 reference book "Distribution System Operation: Flexibility Services" (Springer, ISBN 978-3-031-92904-5).

Project Location	Naju, Jeollanam-do, Republic of Korea	
Project Period	2023-2027 (ongoing)	
Lead Organisation	Korea Electric Power Corporation (KEPCO)	

Background and Implementation

KEPCO's Energy Valley Microgrid Project was launched in response to Korea's transition from centralized, supply-focused power to decentralized, demand-driven systems. With the rapid growth of renewables under the 2050 carbon neutrality goal, the project aims to solve grid instability, such as voltage fluctuations and supply-demand imbalances, by stably integrating distributed resources. Its objective is to enhance power quality, resilience, and efficiency while reducing infrastructure costs and enabling flexible, reliable grid operation.



KEPCO launched the Energy Valley Microgrid Project in Gwangju-Jeonnang Innovation City to complement limitations of the Mega Grid and enable stable integration of distributed energy. Building on microgrid expertise from Gasa-do, Sinan, and overseas projects, KEPCO collaborates with 13 partners to create an open demonstration cluster that fosters eco-friendly power, regulatory-free zones, and new technology trials. The project is implemented across three domains: (1) Infrastructure – an integrated platform combining solar, wind, fuel cells, and a 10.3 MWh ESS to enhance self-sufficiency and efficiency; (2) Services – demand response with Naju City saving 626 kWh, national DR securing 2,448 kWh, plus smart EV charging and mobile ESS; (3) New Technologies – shared ESS with reuse batteries, T-VPP participation, P2X sector coupling, and a community EMS applying the Flexumer concept, demonstrating campus-level independence at KENTECH. These innovations strengthen flexibility, resilience, and global smart grid leadership.

Project Outcome and Key Messages

Working with local governments, enterprises, and universities, the program has developed an integrated microgrid platform that combines solar, wind, and fuel cells with a 10.3 MWh ESS, enhancing local energy self-sufficiency and operational efficiency. It also piloted demand response schemes—626 kWh through regional DR with apartment complexes and 2,448 kWh via national DR supported by smart EV charging—while introducing new approaches such as mobile ESS for renewable integration, shared ESS using reuse batteries, and sector coupling through P2X technologies.

Stakeholder feedback was incorporated from the outset, shaping dynamic pricing models using AMI data, verification of new apartment-based energy services, and infrastructure for commercialization of advanced technologies. The initiative further contributes to industrial growth by creating an open demonstration cluster, supporting SMEs, and establishing scalable business models such as virtual net metering and participation in regional flexibility markets. Collectively, it provides both environmental benefits, through battery reuse and reduced emissions, and economic value, by lowering grid investment costs and creating new market opportunities.

PARMENIDES
(Plug & pLAY eneRgy ManagEmeNt for hybrID Energy Storage)

Project Location	Vienna, Austria	
Project Period	2013-2025	
Lead Organisation	AIT Austrian Institute of Technology GmbH	

Background and Implementation

The PARMENIDES project (Plug&pLAY eneRgy ManagEmeNt for hybrID Energy Storage), a Horizon Europe initiative, develops an interoperable and ontology-based Energy Management System (EMS) for Hybrid Energy Storage Systems within Local Energy Communities (LECs). It addresses the challenge of integrating distributed renewables and electrified demand, especially high solar PV penetration and EV charging, which strain distribution grids.

At Heimschuh (Styria), where PV density is among the highest regionally, PARMENIDES deploys two key innovations: Grid Capacity Management (GCM) and AI-based Distribution System State Estimation (DSSE). GCM dynamically allocates feeder capacity among flexible assets—community battery, EV chargers, smart heat pumps—ensuring voltage and thermal safety while maximising renewable use. DSSE, trained on a digital twin with limited smart meter data, provides real-time visibility of voltages and line loadings, acting as a cost-effective “virtual sensor” network.

These tools build on earlier blockchain-based trading pilots, which boosted local PV self-consumption but revealed the need for active grid control. The Austrian pilot integrates GCM, DSSE, and EMS for HESS into a secure ICT infrastructure under the PARMENIDES Energy Community Ontology, ensuring interoperability and scalability. By 2025, the live Heimschuh system demonstrates how intelligent capacity management and AI-driven observability can enable safe, flexible, and citizen-centric energy communities, extending asset life, deferring costly upgrades, and supporting Europe’s clean energy transition.

Project Outcome and Key Messages



The PARMENIDES project demonstrates compelling economic, technical, social, and environmental value through its Grid Capacity Management (GCM) and AI-based Distribution System State Estimation (DSSE). For DSOs, these solutions defer costly upgrades by optimizing existing assets, saving significant capital and operational expenditures. By managing voltage and load constraints, DSOs extend asset lifespans, cut maintenance costs, and avoid penalties for service quality issues.

The AI-driven DSSE achieves accurate grid observability with fewer sensors, reducing hardware and installation costs. This digital-first approach shifts investment from physical expansion to smart, software-based grid optimisation.

Community participants benefit equally. Prosumers can fully utilise PV generation and storage, reduce curtailment, and share surplus energy locally. This lowers household energy bills, opens revenue streams via demand response and storage services, and increases local self-sufficiency. Flexibility from community assets supports peak shaving and valley filling, which reduces DSOs’ power procurement costs and imbalance penalties, while localized consumption cuts distribution losses and enhances overall system efficiency.

Technically, the innovations are scalable and replicable. Both GCM and DSSE are grid-agnostic, requiring only feeder models and basic parameters. DSSE uses simulated rather than historical SCADA data, enabling rapid deployment even in poorly monitored grids. The project’s modular architecture and the PECO ontology ensure interoperability across platforms, while reliance on off-the-shelf hardware supports cost-effective rollouts. Successful pilots in Austria and Sweden prove adaptability under diverse grid conditions and regulatory environments.

Beyond economics and technology, PARMENIDES advances sustainability and citizen engagement. By enabling higher PV utilisation, the project reduces CO₂ emissions and strengthens climate action. Community involvement fosters energy democracy, giving citizens ownership and direct benefits, which enhances acceptance of renewable projects. Policy-wise, it provides evidence for regulators to enable flexibility-based community integration while safeguarding reliability, and it strengthens standards for data interoperability.

PARMENIDES delivers a replicable blueprint for smart grid innovation that optimises utility assets, empowers communities, integrates renewables, and advances environmental and policy goals.



The 11th ISGAN Awards of Excellence: *Honorable Mention*

greEN Energy hUbs for local integRated energy cOMmunities optimization (eNeuron)



Project Location	Multiple EU countries (Pilot sites across Italy, Portugal, Norway, and Poland)
Project Period	2020-2025
Lead Organisation	Eindhoven University of Technology

Background and Implementation

The eNeuron project extends Local Energy Communities (LECs) into Integrated Local Energy Communities (ILECs) to overcome key limitations: single-carrier optimisation, reliance only on day-ahead forecasts, and centralized data raising privacy and scalability concerns. So, the project introduces a cloud-native, privacy-preserving toolbox that co-optimises electricity, heating, cooling, and gas across planning, day-ahead scheduling, and real-time 15-minute operation. And this is done seamlessly in two layers -one at the user and the other at the community level. The project aligns with EU priorities such as Fit-for-55, CO₂ pricing, the Green Deal, RepowerEU, and GDPR compliance, highlighting the need for scalable and user-centered solutions.

Innovations include integrated multi-carrier optimization, Model Predictive Control (MPC) with short horizons, a two-layer structure (community-level energy hub ↔ household micro-hubs), multi-objective optimization (cost, CO₂, comfort), modular microservices, and peer-to-peer coordination securing convergence and collaboration between the two layers while ensuring privacy and adaptability.

Implementation followed a structured approach:

- Analysis (WP2–3): Identified regulatory, technical, and business model barriers, producing a “Limitations Atlas”, use-cases and business models for the multi-carrier energy systems.
- Development (WP4): Built optimization toolbox include cloud-native services, and P2P pricing.
- Validation (WP5): Simulation, hardware-in-the-loop, and lab testing ensuring reliability.
- Pilots implementation (WP6): Demonstrated in Italy, Portugal, Norway, and Poland.
- Replication (WP7–8): Produced replicability and scalability roadmaps, investor guidelines, and policy briefs.

Overall, eNeuron proves how cloud-native, multi-carrier optimisation and user-driven design can transform communities into resilient, decarbonised ILECs, supporting Europe’s clean energy transition.

Project Outcome and Key Messages

The eNeuron project demonstrated how Integrated Local Energy Communities (ILECs) can deliver measurable environmental, economic, and social benefits through cloud-native, multi-objective, multi-carrier optimisation. Across the four pilots (Italy, Portugal, Norway, Poland), it achieved significant results: CO₂ reductions of –55% to –91%, energy cost savings up to –36%, network loss reduction by –47%, and nearly 100% system uptime. It also improved self-sufficiency (+46%), self-consumption (+19%), and energy efficiency (+37%), while ensuring full GDPR compliance and high user acceptance (index 4.3/5).

The project’s economic rationale is strong: By deferring grid reinforcement (e.g. €1.2M savings in Norway) and lowering O&M costs (€12.8k/year in Portugal), it provides a clear business case for DSOs and energy communities. Replicability and Scalability(R&S) potential was investigated with >160 stakeholders engaged, producing replication roadmaps, and alignment with EU frameworks scoring high indexes in both R&S.

[Key Achievements]

- Cost and carbon savings without comfort trade-offs – a dual impact that accelerates the clean energy transition.
- Multi-carrier and privacy-first optimisation – unique integration of electricity, heating, cooling, gas, and mobility in a GDPR-compliant architecture.
- Scalable and replicable – validated in diverse climates, infrastructures, and regulatory settings, with toolkits for widespread adoption.
- Open, cloud-native technology – modular, vendor-agnostic, and future-proof, enabling market uptake without lock-in.

The eNeuron project proves that digitally sovereign, citizen-centred energy communities can become a cornerstone of Europe’s decarbonisation, delivering both resilience and fairness moving towards the vision of the integrated grid approach.

✦ 2025 ISGAN Awards Jury Panel ✦

The ISGAN Awards of Excellence is honoured to be evaluated by an outstanding panel of international experts, representing utilities, research institutes, think tanks, and academia. Their diverse expertise ensures fairness, depth, and global perspective in recognising the most innovative and impactful smart grid projects worldwide.

We warmly thank our 2025 Jury Panel for their commitment, impartial judgement, and global perspective. Their dedication not only upholds the prestige of the ISGAN Award of Excellence but also inspires collaboration and innovation in the global clean energy transition.

Reji Kumar Pillai



- Jury Chair
- President, India Smart Grid Forum (ISGF)
- Chairman, Global Smart Energy Federation (GSEF)

Ravi Seethapathy



- GSEF Ambassador for Americas
- Executive Chairman, Biosirus Inc. Canada

Richard Schomberg



- President, RJS energy
- EDF Fellow
- IEC Ambassador for Smart Energy

Valerie Anne Lencznar



- Advisor, Ministry of Energy of Moldova
- GSEF Ambassador for Europe

Mark McGranaghan



- Fellow, Electric Power Research Institute (EPRI)

Andres Carvallo



- Professor, Texas State University

Nobuyuki Yamaguchi



- Professor, Department of Electrical Engineering, Faculty of Engineering, Tokyo University of Science

