SP Distribution and SP Manweb

Network Innovation Allowance Annual Summary 2024-25

SP Energy Networks

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At SP Energy Networks, innovation is at the heart of our strategy to deliver a smarter, more sustainable energy future. As we work towards the UK's 2050 decarbonisation goals, we're focusing on forward-thinking, cost-effective solutions that go beyond traditional network upgrades.

This strategic approach not only delivers better value for our customers, but also helps create a Just Transition– ensuring that vulnerable communities are supported and no-one is left behind.

Eddie Mulholland
SP Energy Networks Director
of Processes and Technology

If you have an idea to share or would like more information on a specific project, please contact our innovation team at: innovation@spenergynetworks.co.uk

Our **Network Innovation Allowance (NIA) portfolio** remains the cornerstone of our innovation efforts. It gives us the flexibility to explore early-stage ideas with speed and creativity – helping us unlock new technologies and strengthen our role as a Distribution System Operator (DSO). It's thanks to our Open Innovation model and our trusted project partners that we're able to turn fresh ideas, from colleagues and stakeholders, into real-world solutions that make a lasting impact. Our innovation partnerships span across small, medium and large enterprise, public sector, academia and non-profit organisations. As we grow our portfolio, we're creating even more collaboration opportunities.

This Annual Summary Report highlights the NIA projects initiated, ongoing, or completed during 2024-25. These projects span six key enabling themes:

- Power Electronics
- Network Resilience
- Whole Energy System
- Data & Digitalisation
- Sustainability
- Consumer Vulnerability

We are proud of the tangible benefits already delivered. In RIIO-ED2, the solutions we've implemented from our NIA portfolio have delivered £18.6m in benefits across our SP Distribution and SP Manweb licence areas so far. We expect the future benefits of our solutions, already estimated to be in excess of £60.3m, will continue to increase over the coming years.

Innovation is embedded across our operations, accelerating our Net Zero transformation and enhancing the safety, reliability, and resilience of supply for our customers in **Central and Southern Scotland** and **North Wales, Merseyside, Cheshire and North Shropshire**.

Our innovation continues to strengthen our DSO capabilities and support the Energy System Transition:

- **Real Time Fault Level Monitoring** and **Active Fault Level Monitoring** are supporting the growing uptake of Low Carbon Technology through careful management of network fault level.
- **Connected Island** has developed a framework for successfully connecting community microgrids based on international experience and best practice.
- **LV De Mesh** and **Interconnected HV Substation Battery Monitor** are developing technologies to reduce supply interruptions and keep customers connected.

We're also finding new and meaningful ways to support customers in vulnerable situations as part of our Just Transition strategy. One example you'll find in this year's report is the WARMTH project, which is exploring how a Warm Home Prescription model could be woven into our operations – helping people stay warm and well through the winter months.

I'm genuinely proud of the impact our innovation portfolio is having – for our customers, colleagues and stakeholders. And I'm excited about what's ahead. Our continued commitment to innovation means we'll keep delivering real benefits for people across the UK, while helping to shape a more inclusive and sustainable energy system for all.

£18.6m in benefits delivered in RIIO-ED2

SPM £6.2m

SPD £12.4m

Network Innovation Allowance Portfolio Summary

SPEN Projects

14
Active SPEN-led Projects 2024/25

13
Live Projects

1
Completed Project

In the 2024/25 reporting period, we have registered 4 new NIA projects.

Partner-led Projects

6
Active Collaboration Projects 2024/25

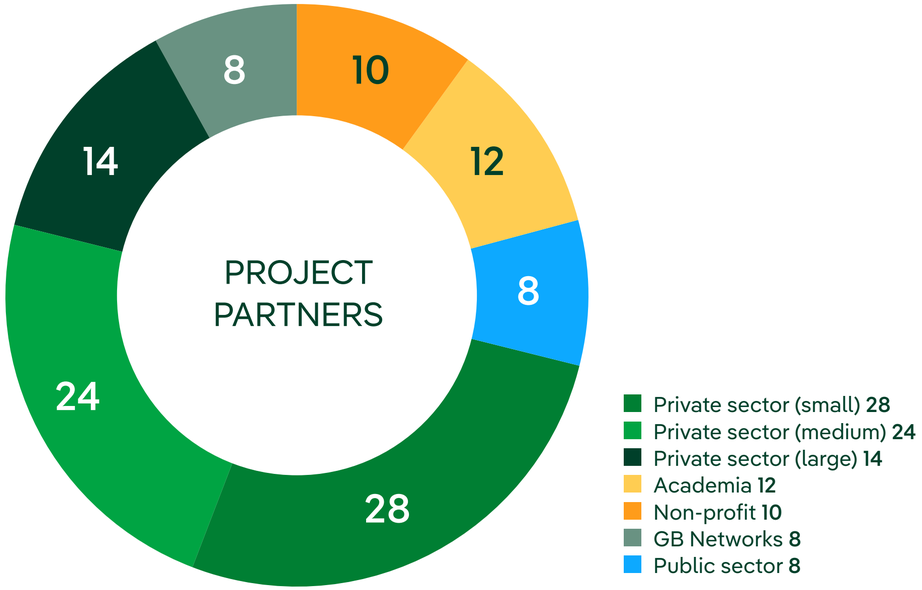
3
Live Collaboration Projects

3
Completed Collaboration Projects

In the 2024/25 reporting period, we have partnered with collaborators on 3 new NIA projects.

Our commitment to innovation

We continue to build on the innovation strategy outlined in our RIIO-ED2 Business Plan. To date, this strategy has delivered £12.4 million in benefits across our SPD area and £6.2 million in our SPM area. It ensures we maintain a well-balanced portfolio that addresses the core challenges of accelerating the energy system transition while supporting consumers in vulnerable circumstances. Working with a broad range of project partners ensures we have access to diverse ideas and capabilities to support our innovation. We're proud that 50% of our project partners fall under the Small-to-Medium Enterprises (SMEs) category – which demonstrates our commitment to supporting grassroots innovation.



Our six strategic themes guide the direction of our innovation portfolio, which includes the Network Innovation Allowance (NIA) included in this report, as well as flagship initiatives funded through the Strategic Innovation Fund (SIF) and Network Innovation Competition (NIC).

Network Resilience

Our Network Resilience theme is centred on preparing the grid for the rapid growth of Low Carbon Technologies (LCTs) and distributed generation. It focuses on developing innovative solutions that modernise network operations and enhance the efficiency and effectiveness of our assets and practices. **The SMARTer Selection of Automatic Sectionaliser Links** project is a key example of this, with the aim of reducing customer interruptions.

Sustainability

Protecting the environment is at the heart of achieving Net Zero, and the journey to get there must reflect that same commitment. Innovation is essential to ensuring our transition is not only effective but also sustainable – helping us reduce our environmental impact every step of the way.

Data and Digitalisation

Digitalising our power networks is essential to enabling the shift toward a Distribution System Operator (DSO) model and is a cornerstone of the broader transition to a modern, sustainable energy system.

This means that as we move away from traditional, centralised models of electricity generation and distribution, we need smarter, more responsive, and data-driven infrastructure. Digitalisation involves integrating advanced technologies – such as smart meters, sensors, automation, and real-time data analytics – into the electricity grid.

Whole Energy System

Taking an integrated approach to network planning and operations – one that links different energy vectors and actively involves our customers – is essential to unlocking efficiencies throughout the Energy System Transition. That's why our **Active Fault Level Management (AFLM)** project has been looking at improving fault level headroom, enabling faster and more cost-effective integration of renewable generation.

Consumer Vulnerability

We are committed to ensuring that no customer is left behind in the transition to a low-carbon future. Recognising that consumer vulnerability spans a wide range of circumstances, we focus on developing tailored solutions that address the specific needs of each individual and community as part of delivering a Just Transition.

The **Wellbeing and Resilience through Medical-Thermal Heating (WARMTH)** project aims to identify vulnerable customers who have health conditions made worse by cold conditions and provide them with a warm home through vouchers or home improvements.

Power Electronics

Power electronic technologies are transforming how Distribution Network Operators (DNOs) respond to emerging challenges – particularly the need to maintain a secure and reliable network while managing an increasingly diverse generation mix and evolving consumer behaviours.

Project Highlights

Our projects across our network range in scale and scope to deliver the most impact and benefit to our customers and stakeholders. For this summary report we have highlighted case study examples with significant learning to demonstrate our strategy in action.

You can find the full list of our projects towards the end of this report and online at the Smarter Networks Portal.

Interconnected HV secondary substation battery monitor Pg 07

LV De Mesh Pg 08

Real Time Fault Level Monitoring Stage 2 (ED-2) Pg 09

Active Fault Level Management (AFLM) ED-2 Pg 10

Connected Island Pg 11

SMARTer selection of Automatic Sectionaliser links Pg 12

WARMTH (Wellbeing and Resilience through Medical-Thermal Heating) Pg 13

NIA 2024-25 Portfolio Pg 15

Registered ID:	Registered value:	Project start date:	End date:	Status:	Link
NIA_SPEN_0091	£249,950	March 2024	June 2026	Live	https://smarter.energynetworks.org/projects/nia_spen_0091/

Network Resilience

Interconnected HV secondary substation battery monitor

Network resilience is essential for delivering a secure and uninterrupted electricity supply to our customers. The Interconnected HV Secondary Substation Battery Monitor project exemplifies how innovative solutions can strengthen and future-proof our network infrastructure.

Overview

Multiple times a year in interconnected HV distribution networks, the unit HV zone protection at the nearest upstream secondary substations may fail to trip in the event of a network fault, due to faulty batteries. As a result, the upstream HV protection at the primary substation needs to clear the fault, and significantly more customers experience loss of supply than if the unit protection was operating correctly to isolate the fault to a smaller zone. The chance of this occurring can be significantly reduced by remote monitoring of the battery condition which is currently done by a yearly onsite inspection.

A basic automated battery monitoring system is proposed using the currently rolled-out LV Monitors. This system will be able to alert the operators when intervention is required, when the batteries may not be operating as intended, enabling earlier detection of faulty batteries and increasing operational reliability of the protection system in the event of a fault on the network.

Expected Benefits

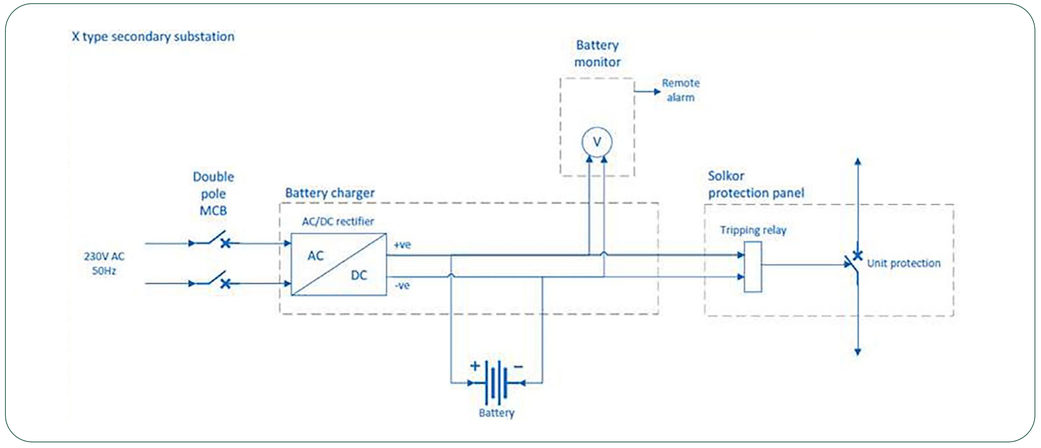
Faster restoration times during HV Faults on Y-type networks, reducing frequency and duration of power outages for our customers.

Progress

- We have defined and approved the Hardware Specification for a universal DC cable design to connect the LV monitor to the battery system.
- Developed and testing the Software Specification in lab trials which has proven the solution works as intended to raise alarms for certain voltage events.
- We're continuing to extend the compatibility of the solution so that it can operate with other LV monitor solutions beyond the EA VisNet. We plan to trial.

Significant Learnings

Over the past year, the Substation Battery Monitoring project has successfully developed and tested a low-cost solution using the VisNet Hub (LV monitoring solution) to monitor 30V battery systems in secondary substations. The system was designed to be retrofitted using a universal DC interface cable and existing LV monitors, avoiding the need for new RTUs. Software has been developed to detect battery and charger failures based on high/low voltage and ripple, with alarms integrated into the Detect Pro interface. Lab tests confirmed the system's accuracy and reliability, though battery impedance measurement was excluded due to the need to disconnect chargers. The project is now ready for field trials, to monitor 25 substations, with to collect data to inform future rollout and compatibility with other platforms like Eneida's DeepGrid devices.



Battery Condition Monitor proposed connection schematic.

Registered ID:	Registered value:	Project start date:	End date:	Status:	Link
NIA_SPEN_0100	£400,000	April 2024	December 2025	Live	https://smarter.energynetworks.org/projects/nia_spen_0100/

Network Resilience

LV De Mesh

Preventing LV cable burnout using a novel network splitter system.

Overview

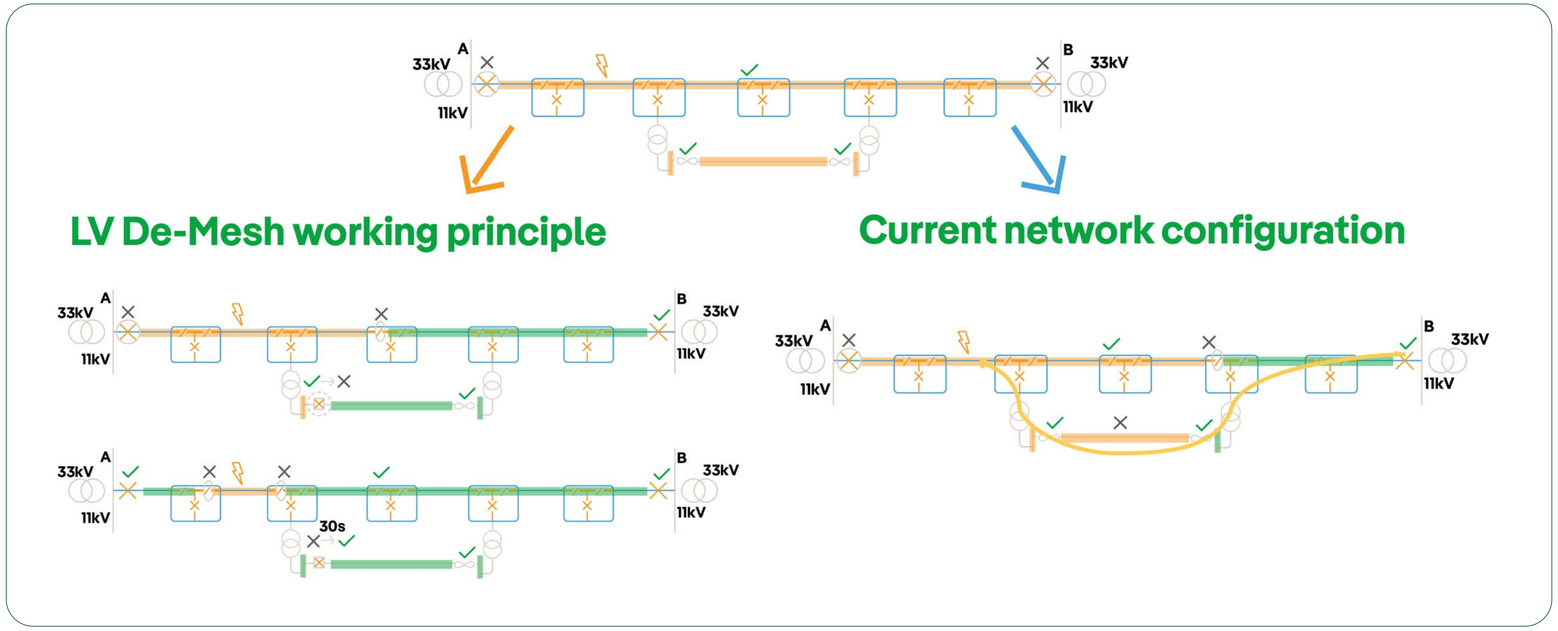
Development, trial and analysis of LV Network Splitter Systems to prevent LV cable burnout during HV faults on interconnected networks and improve restoration performance without expensive HV unit protection.

Benefits

- Faster Power Restoration: The De Mesh Device enables quicker fault isolation and restoration.
- Reduced Disruption: By preventing LV cable burnout, the technology avoids the need for extensive repairs, road closures, and temporary generator deployment – minimising inconvenience for affected households.
- Improved Network Resilience: The system enhances the reliability of the electricity supply, especially in complex Y-type network configurations.

Progress

Over the past year, the LV De Mesh project has progressed through its development cycle, moving from conceptual design to laboratory validation and preparation for live trials. The project began with the creation of a detailed Functional Requirements Specification, which laid the foundation for the design of the De Mesh Device. This specification outlined the operational logic, physical and electrical characteristics, and autonomous behaviour expected from the device. It was developed through a series of collaborative workshops between EA Technology and SP Energy Networks, ensuring that the device would meet real-world operational needs, particularly in managing LV interconnections during HV fault conditions.



Current and proposed network operating scenarios.

Following the specification phase, the project transitioned into the development and testing stage. EA Technology modified their existing ALVIN Reclose2 devices through firmware updates to implement the De Mesh logic. These updates enabled the devices to autonomously disconnect when voltage dropped below a defined threshold and to reclose once voltage stability was confirmed on both sides of the interconnection. The devices were designed to operate independently of communications infrastructure, although they were integrated with VisNet Hubs for monitoring purposes during the trial phase.

Laboratory testing was a key milestone for validating the functionality of the De Mesh Devices. A comprehensive test sheet was developed and executed, covering a wide range of scenarios including voltage loss, restoration, manual override, and fault current response. The tests confirmed that the devices performed as expected, reliably opening and reclosing under the defined conditions. The test results demonstrated the robustness of the firmware logic and the reliability of the hardware in simulating real-world network events. These tests also included stress scenarios such as voltage dips and high fault currents, ensuring the devices could handle extreme conditions without failure.

In parallel, the project team prepared for live system trials by developing installation procedures, safety protocols, and training materials. The De Mesh Operating Instructions were finalised, providing detailed guidance on installation, commissioning, and maintenance. These instructions ensured that field engineers could safely and effectively deploy the devices in substations.

Next steps

By the end of 2024, the project had successfully completed its laboratory phase and is ready to begin live network trials.

Building on the progress to date, live field trials will be carried out to demonstrate the devices ability to:

- Reduce HV fault restoration times
- Reduce risk of LV cable damage
- Improve network resilience

Registered ID:	Registered value:	Project start date:	End date:	Status:	Link
NIA_SPEN_0097	£1,980,000	March 2024	June 2026	Live	https://smarter.energynetworks.org/projects/nia_spen_0097/

Network Resilience

Real Time Fault Level Monitoring Stage 2 (ED-2)

Deploying innovative fault-level measurement devices on our network to monitor and predict network fault level in real-time.

Overview

Fault Level is already one of the greatest network challenges. The network has a safe fault level design limit which cannot be exceeded without splitting up the network, reducing the fault in-feeds or adding new equipment. Generation growth is expected to continue and accelerate as UK generation decentralises to meet Net Zero 2050 targets. Innovation is needed to avoid fault level becoming a barrier to the low carbon transition.

RTFLM Stage 1 project demonstrated a proof-of-concept design to measure fault level in real time. This has been successful, with changes in network fault level registering within a number of seconds. Two prototype devices were built with measurements taken at both 11kV and 33kV in SPEN's SPM network. As SPM run an interconnected network, this also demonstrated success with this network type.

RTFLM Stage 2 extends the trials across multiple networks and network locations. Trials will be extended to include 132kV, split board configurations, and different substation design scenarios. SPEN also intend to undertake a combined trial with a separately NIA funded project looking at Active Network Management based on Fault Level.

Benefits

Over £290,000 of savings delivered in the 2024/25 period from avoided reinforcement costs while facilitating new connections to the networks, particularly for Distributed Generation and other Low Carbon Technologies.

Progress

- Completed requirements, design and safety assessment and multiple devices have now been commissioned as trial installations across SPEN's SP Manweb and SP Distribution licence areas, and UK Power Networks area.
- Results have been ratified through testing completed at both PNDC in Scotland and VEIKI laboratories in Hungary.
- Two trial devices within SPEN's network have now been running for an extended period of time (18 months+). The data from these devices has been analysed in detail and this has provided the required data to complete the development of the device filtering mechanisms to minimise the impact of network noise on the measurements.
- In total 10 devices have been commissioned and data is being collected covering all intended scenarios.
- Results have been disseminated at multiple CIRED and Cigre conferences and ENA Forums. SPEN representatives have also provided presentations and disseminated learnings at Northern PowerGrid's offices, and to wider audiences at the Energy Innovation Centre, that included international representatives.

10
devices commissioned and data being collected

Next steps

The primary ongoing development work is now focussed on the telecoms provision for interfacing with SCADA systems. SPEN has specified IEC104 as the required protocol for this and Outram Research has developed a solution. This is now to be tested within the SCADA development environment for both operational and Cybersecurity requirements prior to deployment. Work is ongoing to ready the technology for deployment into Business-as-Usual operations.

Registered ID:	Registered value:	Project start date:	End date:	Status:	Link
NIA_SPEN_0096	£1,050,000	March 2024	March 2026	Live	https://smarter.energynetworks.org/projects/nia_spen_0096-1/

Whole Energy System

Active Fault Level Management (AFLM) ED-2

The AFLM project supports the whole energy system strategy theme through improving fault level headroom, enabling faster and more cost-effective integration of renewable generation. Which in turn will deliver system-wide efficiency and decarbonisation benefits.

Overview

The project aims to develop and trial an Active Network Management (ANM) FLM solution which improves fault level headroom utilisation in order to avoid or defer network reinforcement works and accelerate the integration of renewable generation. The project will implement and demonstrate the solution to provide alternative technical and commercial connection arrangements.

Benefits

Based on an analysis of the ED1 spending required to upgrade the UK primary network, circa 85 actions involve Fault Level Management issues at EHV. Such interventions would be similar to those faced by generators aiming to connect into fault level constrained networks. Based on an analysis of the proposed schemes, the savings would be in excess of £600,000 per Grid Supply Point (GSP).

Progress

Phase 1 of the project is complete and considered a toolbox of solutions for the development of active fault level management systems, including modelling, measurement, mitigation and management techniques. A range of networks were assessed with the toolbox of techniques, and cost benefit analyses were undertaken on the concept designs.

Potential savings of
£600k
per GSP

Phase 2 of the project is complete and progressed a solution design with prototyping and laboratory-based testing. This has refined the AFLM concept and use cases, including development of the AFLM specification, requirements, design principles, and high-level commercial principles of access. Development of a prototype AFLM solution has been progressed. This prototype has undergone laboratory based testing.

An area of network (Warrington) has been selected to refine the solution. Long run tests, network and system studies and scalability assessments have been undertaken to provide a foundation for a production grade AFLM network trial in Phase 3 of the project.

Phase 3 is in progress. The development of the network architecture, functional specification and the detailed design specification was completed, defining all operational requirements for deployment of the trial. Some delays were encountered, which mostly related to stringent Cybersecurity requirements.

Significant Learning

The interface between the AFLM system and SPEN's SCADA system has been fully developed and the system tested within the offline SCADA development environment (Site Acceptance Testing – SAT). This testing simulated the real-world operation of the system within a controlled environment. Senior Control Engineers supported this testing by operating the offline SCADA system to run multiple network scenarios.

The Senior Control Engineers will be the end-users of the system when implemented. Positive feedback was provided that the AFLM system correctly identifies above fault level network states and triggers an appropriate Alarm within the SCADA system that enables them to undertake actions. They were satisfied with the overall approach including how they were able to interact with the system to achieve the network control the project sets out to achieve.

Next steps

Following feedback from our Senior Control Engineers we identified the need to extend our underlying network analysis to consider network security states more sufficiently. It was also identified that more differentiation was needed between alarms for standard operational actions and urgent actions that would be required should the network move into an above fault level state.

This feedback has resulted in changes to the system that is to be processed as a Change Request and subsequent project extension to March 2026. Following the approval of this change request, the necessary modifications will be completed and then the SAT repeated. Assuming successful completion of SAT at that stage, the live trial will then commence.

Registered ID:	Registered value:	Project start date:	End date:	Status:	Link
NIA_SPEN_0095	£196,000	Apr 2024	Dec 2024	Complete	https://smarter.energynetworks.org/projects/nia_spen_0095/

Whole Energy System

Connected Island

Exploring the opportunity for community microgrids to accelerate Low Carbon Technology connections.

Overview

This feasibility study aimed to identify opportunities to improve and evolve the planning and connections process to help the UK achieve its Net Zero targets in a timely and cost-effective manner by exploring the case for community microgrids. These “Connected Islands” were explored as a possible solution to alleviate the connections bottleneck and support integration of Low Carbon Technologies (LCTs) onto the electricity grid.

Benefits

- Simplifying community connections and reducing the costs and lengthy application windows associated with network reinforcement. Improved queue management and supporting the roll-out of low carbon solutions.
- The project will enable the prompt introduction of numerous low-carbon technologies at scale within a self-managed network, without the requirement for major grid reinforcement.
- The connections queue can be efficiently managed to ensure the above benefit can be realised.
- Faster and cheaper network transformation can occur.
- Learnings throughout are captured and used to promote a BaU design and connection application process.

Progress

- **Policy Review:** We examined our existing policies and compared them with EREC standards to identify potential influences on SPEN’s policies and processes. We also conducted interviews with other Distribution Network Operators (DNOs) to compare their approaches and highlight differences in procedures.
- **Expanding Scope:** The research extended beyond the UK, incorporating interviews with Hydro-Québec and a discussion of relevant case studies. Additionally, up-to-date standards and academic papers were reviewed to ensure a broad and informed perspective.
- **Framework Development:** We observed that community microgrids are not well developed in the UK. Using international research and best practices, we developed a framework for implementing a successful microgrid, considering technical, environmental, social, and legal aspects.
- **Cost-Benefit Analysis (CBA):** A high-level CBA was conducted with SPEN to outline the potential benefits of integrating a connected community microgrid into the distribution system.

Significant Learning

We’ve learned that current UK regulations and standards need updating to better support the unique needs of community microgrids to reduce uncertainty and create incentives for communities. We’ve produced a framework that provides a starting point for DNOs to address these challenges.

The cost-benefit analysis developed valuable insights into the potential financial and environmental benefits of community microgrids and highlights the need for site-specific studies before any real-world deployment.

Registered ID:	Registered value:	Project start date:	End date:	Status:	Link
NIA_SPEN_0093	£205,000	December 2023	March 2026	Live	https://smarter.energynetworks.org/projects/nia_spen_0093/

Network Resilience

SMARTer selection of Automatic Sectionaliser links

This project, under the network resilience theme, addresses the limitations of Automatic Sectionaliser Links (ASLs) in isolating HV spur faults.

Overview

There is a growing reliance on reliable electricity supply on our path to achieving our Net Zero targets. An effective HV protection reducing the duration of HV main feeder outages due to faults at HV spurs can have direct positive impact on continuity of supply. However, there have been issues regarding the use of ASLs, such as not isolating the spur at its current threshold.

At present, there are approximately 25,000 ASL units deployed across our distribution network, with around 1,000 units replaced and over 1,400 new units installed annually.

The aim of this project is to research the issues surrounding the use of ASLs and provide recommendations for improvements or alternatives to be included in the BaU integration. The work proposed in this project will play a crucial role in improving network's resilience to HV spurs faults and improve the CI/CML performance of the DNOs.

Expected Benefits

As this is a research project, the expected benefits are not yet quantifiable. However, in WP4 a CBA will be produced which will look into the cost of deploying the identified solution as part of BaU as well as its potential saving.

Progress

Objective 1 : Produce a report containing the most prevalent ASL issues and limitations using real-life examples, and an assessment of available spur protection solutions on the market.

This objective has now been completed.

We reviewed the real-life examples where ASLs did not operate as expected. Those events were modelled using EMTP software and considered the fault scenarios captured from power quality monitoring devices at the primary substation. Based on the results from the power system analysis, we identified limitations of the OHL protection scheme/settings at two primary substations and whether the protection operated correctly for each fault scenario. Also, credible network conditions that could explain why the existing ASLs might not have operated correctly were considered, modelled and reported.

We also carried out extensive market research to investigate the manufacturers and types of modern sectionaliser products that could potentially be used to replace the existing ASLs. We further contacted other DNOs to understand if these products have been used, or tested by them in the UK, Ireland and selected overseas territories. The application of these modern products together with any service experience from the network operators was established.

The findings from desktop simulation studies and market research have been reflected in a report created to meet this project objective.

Objective 2: Test the highest scoring spur protection equipment in a controlled environment and document findings.

Work is still ongoing to meet this objective. Following completion of Objective 1, we have ordered those ASLs shortlisted for laboratory testing. A draft of the test schedule was also developed and shared with Power Network Demonstration Centre where the tests is planned to be completed by the end of Q3 2025.

Objective 3: Provide policy and product specification recommendation for HV spur protection.

The work is still ongoing to meet this objective. We started this phase following the desktop power system modelling and outcome of market research to identify the areas within OHL policy that may need updated specially those partes relevant to application of ASLs. This work will be completed by considering the outcomes of laboratory testing on potential ASL alternatives.

Registered ID:	Registered value:	Project start date:	End date:	Status:	Link
NIA_SPEN_0110	£130,000	March 2025	July 2025	Live	https://smarter.energynetworks.org/projects/nia_spen_0110/

Consumer Vulnerability

WARMTH (Wellbeing and Resilience through Medical-Thermal Heating)

Ensuring our vulnerable customers are taken care of and supported is our utmost priority, guiding our efforts to deliver inclusive, compassionate, and accessible help and support. This is what the WARMTH project aims to achieve.

Overview

Project WARMTH (Wellbeing and Resilience through Medical-Thermal Heating) is a discovery innovation effort that aims to explore how the 'Warm Home Prescription' model can be implemented to integrate with Distribution Network Operators.

The WHP model typically identifies people with health conditions made worse by the cold and prescribes them a warm home via vouchers or home improvements. Under this model, health practitioners identify people whose health conditions are likely to worsen by living in a cold home and prescribe them 'warmth'.

DNOs are the natural energy industry partner for this collaborative effort. The involvement of DNOs can maximise the impact of the WHP model given their complete regional coverage and the broad range of support offered.

The chosen model will be tested in future stages of the project.

Progress

So far, 1 out of 3 milestones have been delivered for project WARMTH. The original method and plan set out for delivery remains on track. Here is a summary of the outcomes delivered in the first milestone.

Our first milestone was focussed on an in-depth study of existing material around the WHP trials including key players, SROI, customer journeys and any gaps in these areas to address. In our first report we:

- Set the scene for the need for warmth prescriptions including insight around living in cold homes and the associated health impacts
- Provided an overview of the WHP key players and their roles in the programme including the services and customer journeys that have been delivered in previous trials
- Delivered an analysis of the trial results and how they provided social value measurements
- Highlighted additional learnings and challenges to address following conversations with key external stakeholders.

Next steps

Work has already begun on analysing how the WHP trials can be adapted to DNO operations, such as identifying what would work well and what may need to be adjusted. Potential models are being developed to align with DNOs' responsibilities around addressing fuel poverty and supporting low carbon technologies. This work will also seek to explore how these models can be integrated with existing support services to ensure a smooth customer experience.

In parallel, stakeholder engagement is currently ongoing and includes both those involved in the WHP trials we reviewed and potential new partners, to test, refine and make sure the design of the proposed models is based on real-world insights. They include health organisations and energy advice providers. This collaborative approach is designed to ensure that the final model is not only shaped by expert input from across the health, energy, and social care sectors but also capable of delivering a measurable social return on investment (SROI).

Planned Projects – SP Energy Networks

We are excited to present a snapshot of our upcoming projects, set to commence in the 2025/26 regulatory year. These initiatives are designed to enhance our network's efficiency, reliability, and resilience, ensuring we meet the evolving needs of our customers and stakeholders.

LCT Determinator

Registered ID: NIA_SPEN_0104
Budget: £800,000
Start date: April 2025
Link: https://smarter.energynetworks.org/projects/nia_spen_0104/

The LCT Determinator project aims to identify the number of Heat Pumps (HPs) and Electric Vehicle (EV) chargers using data from Low Voltage (LV) feeders. The solution will work with existing power quality monitors.

This tool will help Network Operators validate LCT uptake models, improving intervention plans and assessing where network reinforcement is needed. The data will inform future demand and necessary actions to maintain system operation.

Ultimately, the project will benefit customers by ensuring timely Distribution Network Operator (DNO) interventions, preventing barriers to the electrification of domestic heat and transport.

ORION – Digital Transformer Platform

Registered ID: NIA_SPEN_0106
Budget: £776,000
Start date: August 2025
Link: https://smarter.energynetworks.org/projects/nia_spen_0106/

This project will to develop an all-in-one asset management tool for SPEN's transformer fleet. This tool would combine transformer-related asset data with advanced data modelling techniques to allow predictive forecast models to determine overall asset health, maintenance needs and replacement schedules.

The tool will support asset management by automating the analysis of detected anomalies and decision-making to prevent failure. This will allow the user to focus on continuous improvement. Unifying the wealth of asset data from diverse sources; the proposed solution will provide a single view of transformer health, exploiting the combined dataset to deliver new insights, for asset managers and field operatives alike.

Enhanced Asset Visibility & Assessment for Overhead Line Poles (EAVA-OHL)

Registered ID: NIA_SPEN_0108
Budget: £225,000
Start date: May 2025
Link: https://smarter.energynetworks.org/projects/nia_spen_0108/

To ensure compliance with the Ofgem DNO CNAIM v2.1 methodology, an enhanced approach that goes beyond the current practice of hammer and prod testing for wood pole assets is required.

This project will investigate the optimal approach for wood pole condition assessment through a review of existing technologies, including those previously trialled by the networks and compare with current SPEN procedure.

Our NIA 2024-25 Portfolio

These tables summarise our full NIA activities for the 2024-25 year. Learn more and stay updated about an individual project by clicking the link to the ENA Smarter Networks Portal.

Completed Projects	Registration ID	Started
Connected Island	NIA_SPEN_0095	Apr-24

Live Projects	Registration ID	Started
Interconnected HV secondary substation battery monitor	NIA_SPEN_0091	Mar-24
Battery to Bypass Constraints for Smart Local Energy (BBC)	NIA_SPEN_0092	Feb-24
SMARTer selection of Automatic Sectionaliser links	NIA_SPEN_0093	Dec-23
Active Fault Level Management (AFLM) ED-2	NIA_SPEN_0096	Mar-24
Real Time Fault Level Monitoring Stage 2 (ED-2)	NIA_SPEN_0097	Mar-24
Environmentally Acceptable Wood Pole Pre-treatment Alternatives to Creosote (APPEAL) (ED-2)	NIA_SPEN_0098	Apr-24
X-FacTOR Stage 2	NIA_SPEN_0099	Jan-25
LV De Mesh	NIA_SPEN_0100	Apr-24
Switchgear Requirements for Future Networks (ED-2)	NIA_SPEN_0101	Apr-24
Re-Heat: Enabling Renewable Heat (ED-2)	NIA_SPEN_0102	May-24
Systems Thinking Approach to Innovation Management	NIA_SPEN_0103	Jul-24
WARMTH (Wellbeing and Resilience through Medical-Thermal Heating)	NIA_SPEN_0110	Mar-25
PSR Resilience System (ED-2)	NIA_SPEN_102	Apr-24

Collaboration projects

Collaboration is a core aspect of our innovation process and, as well as collaborating with partners on our own projects, we actively support other DNO-led projects that address key industry challenges. Below we have summarised our involvement in NIA projects led by other networks. To learn more about these collaborative projects led by our partners, please refer to the lead DNO Annual Report or visit the Smarter Networks Portal using project links listed below.

Collaboration – Completed	Registration ID	Started
OHL Collision Avoidance	NPG_NIA_045	Aug-23
Step Up Transformer	NPG_NIA_043	Mar-23
CageCapture SF_6 Paint Detection	NIA_SSEN_0059	Sep-22

Collaboration – Live	Registration ID	Started
Net Zero Service Termination 2 Project	NIA_SSEN_0079	Oct-24
Keeping Comms Open	NIA_UKPN0105	Jan-25
Innovation Highway	NIA_UKPN0101	May-24

SP Distribution and SP Manweb

Network Innovation Allowance Annual Summary

2024-25

innovation@spenergynetworks.co.uk
spenergynetworks.co.uk