ENA Annual Innovation Summary Report 2026

The Voice of the Networks

ena energynetworks association

Report highlights

Executive Summary / Key Takeaways

Our **Annual Innovation Summary Report 2026** showcases the impact of innovation across Great Britain (GB)'s electricity networks and the benefit of this to consumers.

This year's report highlights how our members are investing in innovation that will directly benefit households and businesses by making energy more affordable, while enabling Clean Power 2030 and Net Zero.

Through key funding mechanisms like the Network Innovation Allowance (NIA) and the Strategic Innovation Fund (SIF), networks have committed millions of pounds to projects that deliver real-world benefits.

In FY26† alone, networks registered 139 innovation projects, with forecast lifetime financial benefits exceeding £15.9bn* from a total of around £106m of funding provided.

This report features a selection of standout projects, each demonstrating clear benefits for consumers and the wider electricity system.

Figure 1.1 – Innovation Overview

Results & Outcomes

58

Projects deployed into BAU over RIIO-2

>£263m

Cumulative financial benefits to date from projects deployed into BAU over RIIO-2

This Document

The Annual Innovation Summary Report builds on the individual Network Summary Reports to present an aggregated view of the progress made in Innovation over the past year. These reports can be found here. All electricity networks have contributed to this report, allowing it to give a cohesive overview of common Innovation themes and achievements through collaboration over the past year.

The report structure has been updated this year to focus on guiding you through the innovation landscape and understanding the present picture across different networks, policy developments and key topics. To do this the report organises standout project case studies into **four key messages split across two sections:**

1. In the **Who We Work With** section, case studies are selected to showcase openness to innovation from a variety of sources and whole system collaboration.
2. In the **How We Ensure Value for Money** section, case studies are selected to showcase innovation deployment and maximising value for money. A key focus of innovation deployment is how innovation leads to tangible benefits that can be felt by consumers.

As well as communicating the positive impacts electricity network innovation brings to wider society, we intend this document, and the priorities, themes and principles it contains, to help enable collaboration and shape the sector's efforts over the years ahead. Preparation of this document involved networks sharing the challenges they encountered and learnings taken over the innovation process. Further details on the networks' forward look to meet interim and 2050 targets can be found here.

† FY26 refers to the regulatory year 1 April 2025 to 31 March 2026, in line with Ofgem's RIIO reporting cycle.

* Note that financial benefits quoted here are gross, projected lifetime future benefits of the impact of the innovation, not savings already made.

Report highlights

Real world benefits through innovation

Innovation turns new ideas into practical improvements for households and businesses

Together, the nine network operators and NESO turn new ideas into routine improvements for households and businesses. The four areas below summarise what the networks achieved together in FY26. The case studies in sections 4 and 5 show each one in practice.

Key benefits of innovation across all networks

	Openness to new ideas	Whole system collaboration	Innovation deployment	Value for money
Overview	*Networks publish the problems they need to solve, so organisations outside the usual supply chain can offer solutions.* • Fresh expertise from SMEs, start-ups, universities and other sectors • Ideas already proven in other industries reach the network faster	*Networks innovate with gas, water, telecoms and other partners, so a shared problem is solved once.* • Decisions on one system account for the effects on others • Learning is reused wherever the same challenge arises	*Proven innovations move out of trials and into everyday network operations (business-as-usual).* • Lower bills, fewer interruptions and faster connections for heat pumps, solar and EVs • Capacity released, reinforcement deferred and carbon saved	*Networks make every pound of consumer-funded innovation count, spending it once and sharing the cost.* • Results shared on the Smarter Networks Portal avoid duplicate projects • Projects that do not prove out are stopped and learnings are published
Impact	**1,043 ideas generated or received by networks**	**>50 organisations collaborating across sectors**	**£263m tracked financial savings from innovation deployed over RIIO-2**	**31 collaborative projects launched in FY26**

The common thread is adoption: consumers benefit when evidence from successful trials is translated into routine network planning, investment and day-to-day delivery

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1.

Introduction

1. Introduction

1.1 About ENA

We represent the electricity networks that power homes and businesses across the UK and Ireland.

As the voice of the sector, Energy Networks Association (ENA) brings together the owners and operators of licensed transmission and distribution networks. Our members manage and maintain the critical infrastructure that keeps energy flowing safely and reliably.

We work to ensure our networks are among the safest, most efficient, and most sustainable in the world. We influence decision-makers on the issues that matter most to our members, including:

- Regulation and the wider representation in UK, Ireland and the rest of Europe
- Cost-efficient engineering services and related businesses for the benefit of members
- Safety, health and environment across the electricity industry
- The development and deployment of smart technology
- Innovation strategy, reporting and collaboration in GB.

We provide a strategic focus for the sector and act as a central channel of communication. We promote the interests and reputation of our industry and offer a forum for collaboration among our members.

We lead and support a wide range of innovation activities, including hosting events and conferences, such as our Annual Energy Innovation Summit and the Energy Innovation Basecamp.

1. Introduction

1.2 GB Electricity Networks

Electricity networks are critical to Great Britain's journey to Net Zero.

The nine network operators and the National Energy System Operator play a vital role in ensuring the electricity grid can meet the evolving needs of consumers in a changing energy landscape. There are two network types:

- **Transmission networks** – high-voltage systems that transport electricity over long distances from generation sources to regional distribution networks. They form the backbone of our national electricity system.
- **Distribution networks** – lower-voltage systems that deliver electricity from transmission networks directly to homes and businesses. These operate at a regional level and connect our infrastructure to everyday lives.

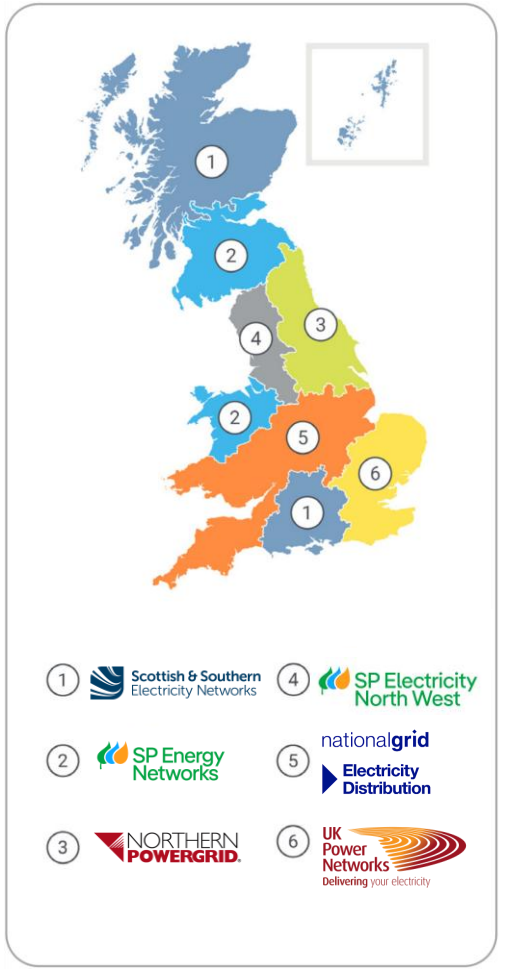
Together, these networks enable the transition to a smarter, cleaner, and more resilient energy future, that works for all consumers.

1.3 Network acronyms

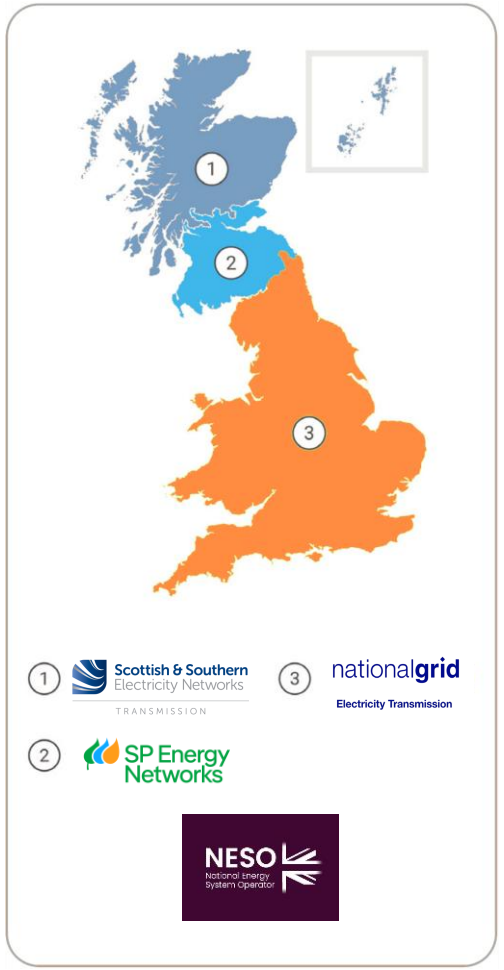
The following acronyms are used throughout this section to refer to electricity networks and the system operator:

- **SSEN-T / SSEN-D:** Scottish and Southern Electricity Networks Transmission / Distribution
- **SPEN-T / SPEN-D:** SP Energy Networks Transmission / Distribution
- **NGET / NGED:** National Grid Electricity Transmission / Distribution
- **SP ENW:** SP Electricity North West
- **NPg:** Northern Powergrid
- **UKPN:** UK Power Networks
- **NESO:** National Energy System Operator

Figure 1.2 – All of the GB electricity networks, as well as NESO, the system operator for England, Scotland and Wales, have contributed to this report



Electricity Distribution Network Operators (DNOs)



Electricity Transmission System Operators (TSOs)

1. Introduction

1.4 Innovation Funding

Strategic Innovation Fund (SIF)

The Strategic Innovation Fund helps energy networks develop big ideas to keep energy affordable, secure and clean. Ofgem replaced the previous innovation scheme (NIC) with this fund during the RIIO-2 price control period, over which it provided £450m for large, transformational projects tackling a wide range of challenges. From RIIO-3 (2026 – 2031), SIF moves to a programmatic approach, setting a long-term strategic direction and enabling collaboration across energy networks on 5 innovation challenges. A further £500m has been allocated with £50m dedicated for deployment.

The five strategic challenges provide a clear, long-term vision for transforming the electricity network. Together, they address the critical outcomes required to accelerate connections, improve network delivery efficiency, enable seamless customer adoption of low-carbon technologies, enhance network resilience, and facilitate decentralised system operation. However, these challenges represent only part of the transformation required.

Delivering a smarter, more resilient, and customer-focused energy system also depends on continued investment in areas such as customer services, operational excellence, digitalisation, workforce capability, and near-term network improvements that provide immediate benefits while enabling longer-term change. This is why both Network Innovation Allowance (NIA) and business-as-usual (BAU) investment remain essential, ensuring that innovation is balanced between transformational ambitions and practical improvements that deliver value today

Network Innovation Allowance (NIA)

Ofgem created the Network Innovation Allowance to support projects that explore better ways of running energy networks. These projects can be technical, commercial, or operational, and must deliver network benefits. Each network licensee receives a set NIA budget as part of their RIIO price control allowance. The NIA provides limited funding to RIIO network licensees to fund smaller technical, commercial, or operational projects directly related to their networks and could deliver financial benefits to them and their customers.

This funding started during the RIIO-1 price control period, continued through RIIO-2, and will carry on into RIIO-3 for electricity distribution and transmission networks, as well as the National Energy System Operator (NESO). The periods covered by these price controls are presented below.

Price control period	Electricity Transmission	Electricity Distribution
RIIO-1	2013-2021	2013-2023
RIIO-2	2021-2026	2023-2028
RIIO-3	2026-2031	2028-2033

Business-as-usual (BAU) Funding

Networks also fund innovation directly from their own business budgets, alongside Ofgem's dedicated funding mechanisms, from project conception to deployment. This investment comes from core price control allowances and shareholder funding, rather than a ring-fenced innovation pot. For example, UKPN in their ED2 business plan committed £50m to business-funded innovation with half invested directly by its shareholders.

Wholly BAU funded innovation projects include SSEN-T's Modular Substations project which is exploring ways to standardise and accelerate substation installation and commissioning, and SP ENW's Resilire project which enables assessment of whole network resilience of the electricity network to severe weather.

2.

FY26 Year in Review

2. FY26 Year in Review

2.1 Key Metrics

FY26 marks the third year of RIIO-ED2 for electricity distribution network operators (DNOs) and the fifth year of RIIO-T2 for transmission system operators (TSOs). Data on all network projects and benefits have been tabulated and collated in the FY26 IMF[1] data (and the Balanced Scorecard – see Figure 2.1) referenced throughout this report.

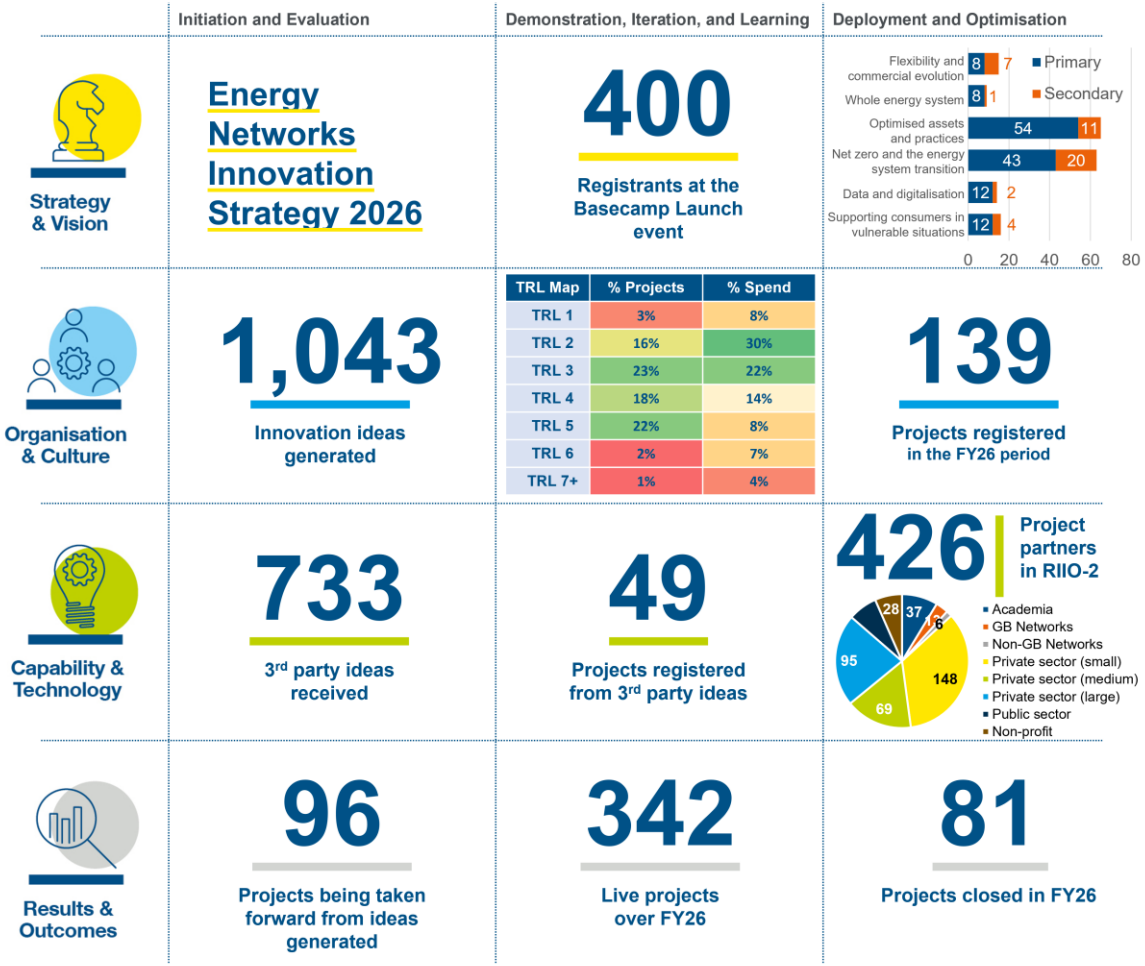
The **Balanced Scorecard** highlights four performance indicator groups identified by the networks as key enablers of innovation: Strategy & Vision, Organisation & Culture, Capabilities & Technology, and Results & Outcomes. The three columns map these performance indicators to the three stages of the innovation process (1 - Initiation and Evaluation; 2 - Demonstration, Iteration, and Learning; and 3 - Deployment and Optimisation) to show how networks are performing against each indicator throughout the innovation process.

This year's scorecard shows continued strength in the number of ideas generated/received and in the number of projects registered from third party ideas. There have been several notable conferences held this year (discussed further on the next page) that have supported the development of new initiatives to facilitate even more ideas.

The 2026 Balanced Scorecard demonstrates significant progress in the number of projects registered and their distribution across innovation themes. FY26 has seen a robust total of 139 projects registered. Collaboration remains a key focus, as evidenced by the substantial number of projects developed from third party ideas. In FY26, 49 projects originated from external collaborations, while the number of project partners is 426.

2.2 Balanced Scorecard

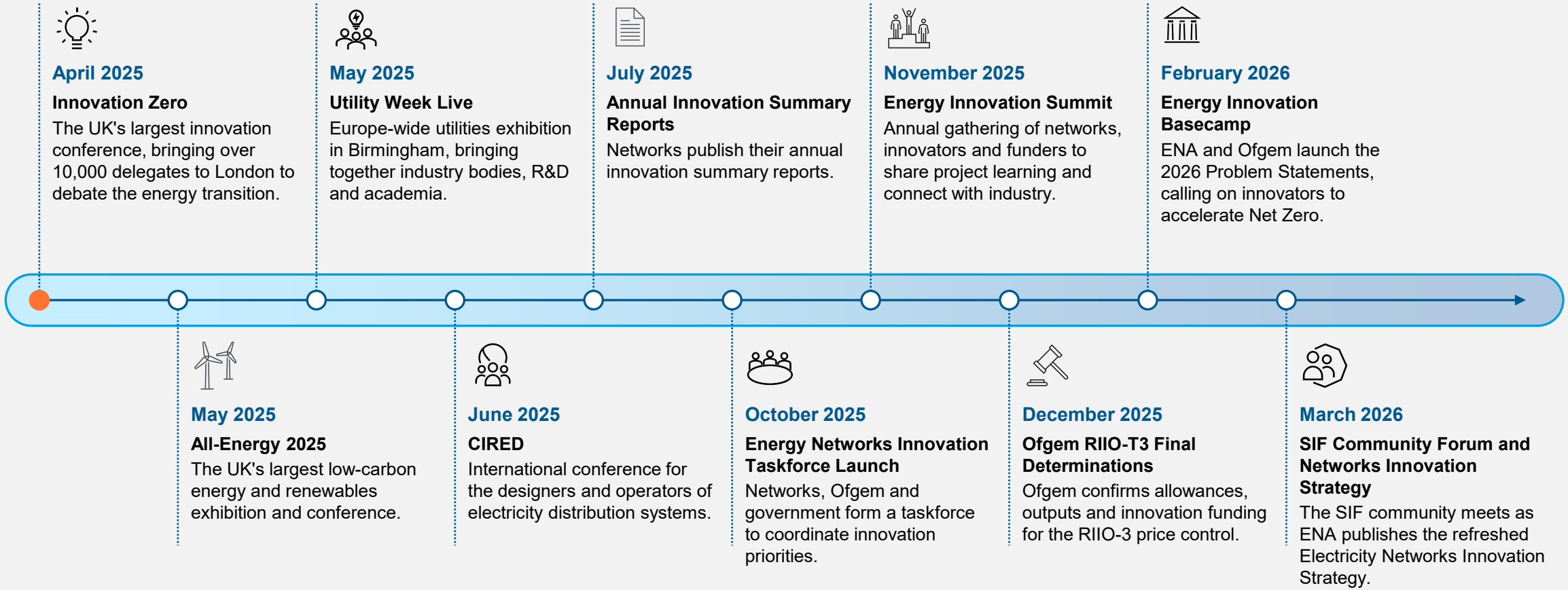
Figure 2.1 – FY26 Balanced Scorecard



[1] Innovation Measurement Framework – a mechanism by which networks submit data on innovation projects

2. FY26 Year in Review

2.3 Innovation Key Event Timeline – FY26



3.

POLICY OVERVIEW

3. Policy Overview

Policy plays a pivotal role in shaping the future of the UK energy system, setting ambitious decarbonisation timelines that electricity networks are instrumental in delivering. The policies below are those with the greatest influence on electricity network innovation over the period ahead.

Policy	Overview
Clean Power 2030	UK government is committed to at least 95% of Britain's power being produced by clean sources by 2030. This will require whole system coordination and improved grid flexibility to account for increased amounts of low-carbon generation.
Connections Reform	This reform addresses the overly congested grid connections system, changing it from "first come, first served" to "first ready, first connected". This will require improved digital load forecasting capabilities as well as maintaining safe and efficient operation of networks as more (often HV) generation and demand comes online.
Warm Homes Plan	The UK Government's £15bn Warm Homes Plan aims to upgrade up to five million homes by 2030. Grants will fund heat pumps, solar, battery storage and insulation for low-income households, with low and zero-interest loans for other homeowners. Networks must plan for the rise in electrified, flexible domestic demand.
Future Homes Standard	From 2025, new homes in England must cut carbon emissions by 75–80% through energy-efficient design and low-carbon heating, shifting new-build demand to electricity and adding heat-pump load networks must plan and connect for.
Strategic Spatial Energy Planning (SSEP)	SSEP will set out where and when electricity and hydrogen generation and storage should be built across Great Britain. Taking a zonal rather than project-level view, it gives networks, investors and government a shared picture of future need, and works alongside the Centralised Strategic Network Plan and Regional Energy Strategic Plans.

4.

Who We Work With

4. Who We Work With

Being transparent about the challenges we need to solve, sharing what we learn and working with diverse partners to turn innovative ideas into better outcomes for consumers.

Storms Arwen and Éowyn each cut power to around a million homes. Events like these cross organisational boundaries, so networks are working with partners in other sectors to model knock-on effects and restore supply faster. Innovation helps networks spot failing assets earlier, identify interdependencies across sectors and restore supply faster. NGET's CALICS project, for example, is testing fibre-optic monitoring that can spot faults at transmission cable joints over thousands of kilometres, before they cause major failures.

Electricity networks work with partners beyond their established supply chains, bringing together fresh perspectives, specialist expertise and proven ideas from other sectors. This spreads learnings and accelerates solutions, helping deliver a more reliable, affordable and low-carbon energy system for consumers. The case studies in this chapter explore two key messages: (1) openness to innovation from a variety of sources, and (2) whole system collaboration.

1. Openness to innovation from a variety of sources

The range of organisations delivering innovation with networks has widened, from large technology suppliers to SMEs and start-ups to university partners, and the route in has become clearer for organisations that have never worked with a network before. NPg's Project VOLT sources its microgrid designs from the energy users themselves, with a port, an airport, a vehicle manufacturer and a gas network shaping the specification while SSEN-T's Aquila Lite draws its technical model from multiple vendors rather than a single incumbent supplier.

Openness also means being clear about the questions being asked. Networks publish the challenges they are trying to solve, the criteria used to select projects and the learning that comes out of them. The outcomes of innovation projects funded through the Network Innovation Allowance and the Strategic Innovation Fund are reported on the ENA's Smarter Networks Portal. This reporting include progress against the project's problem statement and whether the project delivered its objectives. In addition, projects like UKPN's Future Fleet which convenes logistics operators, energy innovators and technology providers around a shared fleet electrification challenge, publish the project's problem statement so organisations outside the usual supply chain can contribute solutions.

49

projects registered from third-party ideas in FY26

1,043

ideas generated or received across the nine networks and NESO

£106m

innovation funding committed in FY26

4. Who We Work With

NET ZERO TERRACE (SP ENW)

Bringing low-carbon heat to terraced homes with no room for a heat pump

Lead network

SP Electricity North West

Partners

looped ENERGY COMMUNITIES

BH

Many terraced homes have no outside space for an air source heat pump, so their residents risk being left behind as heating decarbonises. Net Zero Terrace (NZT) solves this with a shared ambient loop: ground source heat pumps take heat from a loop that serves the whole street, so no home needs its own outdoor unit.

The street runs as a community-led Smart Local Energy System (SLES). A Home Energy Management System (HEMS) in each house and a Community Energy Management System (CEMS) coordinate heat pumps, thermal storage, community storage and solar, and can offer flexibility to SP ENW. This lifts heat pump uptake, avoids the high running costs of direct electric heating and defers network reinforcement.

After SIF Discovery and Alpha, the project moved to NIA ahead of a SIF Beta bid. Working across the whole system with SP ENW, its technology partners and residents took NZT from concept to a working minimum viable product.

- Funded: £680,616 (NIA)
- Project timeline: May 2025 – June 2026
- Project partners and collaborators: Buro Happold, Looped Energy Communities
- Project lead: Rachel Stanley, Innovation Project Manager

Smarter Networks Portal project page

Benefits

Deferred reinforcement and lower customer costs:

Benefits of £15.88m across SP ENW based on an 80-100% uptake.

TRL change

4 to 6

Key message

Openness to innovation from a variety of sources

4. Who We Work With

SIF BLADE (SPEN-T)

Restoring the onshore grid from offshore wind after a national power outage.

Lead network

SP Energy Networks

Partners

Scottish & Southern Electricity Networks TRANSMISSION

CARBON TRUST

tnei

University of Strathclyde Glasgow

System restoration today relies on large synchronous generators, and the number of those assets is falling as the system decarbonises. SIF BLADE demonstrates how novel technology can let offshore wind farms restore the onshore grid after a black-out, and then develops the market requirements and technical specifications needed for commercial roll-out.

The Alpha phase found that restoration from offshore wind is technically feasible, but that the proposed market is not clear enough, technically or commercially, for wind farm developers to participate. The Beta phase works on both: standard specifications for wind farms and networks, and the costs and evolved market requirements behind them.

It combines off-the-shelf grid forming batteries and turbines, OEM technology not yet on the market, and learning from Distributed Restart and Dersalloch, brought together by a consortium of transmission owners, ten offshore wind developers through the Carbon Trust's Offshore Wind Accelerator, OEMs and universities.

- Funded: £5,454,276 (SIF Beta)
- Project timeline: Sep 2024 – Oct 2027
- Project partners and collaborators: Offshore wind developers via the Carbon Trust's Offshore Wind Accelerator, OEMs and research partners.
- Project lead: Ahmed Salama, Project Manager

Smarter Networks Portal project page

Benefits

Financial:

Offshore wind contributing to restoration, rather than more low-carbon thermal generation, is worth £0.9bn-£1.6bn to 2050, a 12-year payback on Beta. NESO expects offshore wind may need to provide around 24% of restoration services by 2050.

New markets and revenues:

No wind farm provides restoration services today. Clear specifications and costs would let developers bid into NESO restoration tenders.

Key learning:

Feasibility was not the barrier; market clarity was. Working in the open through a consortium representing the key players in the industry ensures that the project outcomes are both technically and commercially feasible and have a smoother path to BAU adoption.

Key message

Openness to innovation from a variety of sources

4. Who We Work With

Innovating across vectors and sectors, so a problem is solved once and the learning can be applied wherever the same challenge arises, improving whole system efficiency.

2. Whole system collaboration

Clean Power 2030 and Strategic Spatial Energy Planning require networks to plan with gas, generation, transport and industry, not in isolation. Many network challenges sit at those boundaries, so innovation projects increasingly bring in the organisations on the other side of them.

Projects run jointly with gas networks test how the two systems interact, so decisions taken by one network are made considering the consequences for the other. UKPN's CReDO+ works with gas networks and other critical infrastructure operators including water and telecoms to quantify the interdependencies between electricity and gas assets, so cascading climate risks are assessed across the system rather than one sector at a time, and shows where coordinated resilience investment beats sector-specific spend. SPEN-T's Vibration Monitoring of Wind Turbine Effects on OHL Conductors project is using sensors to measure how nearby wind turbines cause overhead lines to shake. Each turbine-related outage it helps prevent could save £450k, a saving passed on to consumers through lower energy bills.

Collaboration also reaches beyond the energy sector. Industry, ports and consumer-facing organisations hold data, assets or consumer reach that networks do not. SSEN-D's Grounds for Change project is adapting trenchless methods proven in telecoms, water and gas to low-voltage cable work, aiming to cut the cost and disruption of the street works needed for electrified heat and transport and has collaborated with the Energy Innovation Centre to facilitate involvement of small innovators across the energy system. SPEN-D's Net Zero Industrial Pathways scales the approach proven in North-East Wales across the whole licence area, working with regional stakeholders to build the first whole energy system view of industrial decarbonisation demand and closing a gap in ED3 planning. UKPN's Electric Thames works with the Port of London Authority, vessel operators and Marine Zero to plan the electrification of Thames commercial shipping.

The Energy Innovation Summit, held at the SEC in Glasgow on 5–6 November 2025 under the theme of accelerating innovation to deliver CP 2030 outcomes, brought the networks and their partners together around that agenda.

11

energy networks beyond ENA members listed as collaborators on live FY26 projects

>50

collaborating organisations across gas, water, renewable generation and customer-facing sectors

22%

of FY26 projects delivered with at least one electricity network partner beyond the lead network

4. Who We Work With

CReDo+ (UKPN)

Accelerating resilience planning via a climate resilience digital twin to map cross sector network assets

Lead network

UK Power Networks
Delivering your electricity

Partners

CATAPULT Connected Places
CMCL
UKRI Science and Technology Facilities Council
SP Energy Networks

Extreme weather affects energy, water and telecoms assets together, and a failure on one network can cascade to the others. Each operator largely assesses this risk on its own, so the knock-on effects between systems are hard to see and plan for.

UKPN has partnered with organisations across the energy system and beyond to build CReDo+ which is a novel enhancement of the original Climate Resilience Demonstrator (CReDo) climate change adaptation decision support tool.

CReDo+ will scale up across the energy sector and develop a user-friendly platform for asset experts to quantify their combined knowledge of risk under extreme weather conditions into new statistical models. By connecting these asset impact models across the network, CReDo+ will capture a system level view of cascading risk, enhancing the ability of network operators and wider connected asset owners to build systemic climate resilience and robustness.

- Funded: £ 10,896,603 (SIF)
- Project timeline: Oct 2023 – Mar 2028
- Project partners and collaborators: Connected Places Catapult, CMCL, Cadent, National Gas, Scottish Power, NESO, BT, Thames Water, Anglian Water and academia
- Project lead: James Daniel, Innovation Project Manager

Smarter Networks Portal project page

Benefits

Societal:

£248m customer benefits through Customer interruptions (CI) and customer minutes lost (CMLs) reductions.

Whole system collaboration:

The CReDo+ Resilience Working Group brought together energy networks, as well as water and telecommunications organisations to build resilience at a whole system level.

Key learning:

A wireframe and technical requirements were defined for the digital elicitation tool, including features for a graphical interface and online questionnaire distribution, which will shape the development roadmap for model creation and stakeholder input.

Key message

Whole system collaboration

4. Who We Work With

VERIFY (SSEN-D)

Vulnerability evidence for resilience and flexibility investment.

Lead network

Scottish & Southern Electricity Networks

Partners

SGN, E.ON Next, Data Communications Company, Centre for Sustainable Energy, Aberdeen City Council, QUARRIERS, Smith Institute, CGI

VERIFY (Vulnerability Evaluation for Resilience Investment and Flexibility) combines data on networks, properties, consumer demographics and smart meters to ensure electricity networks can better tailor network investments to match the needs of local consumers. The project is delivered with a range of subject matter experts and innovators from the charity, technology, industry and academic sectors, in collaboration with SGN.

Quarriers, a third-sector charity partner, brings insight into supporting customers with home carers and into digital inclusion. The Centre for Sustainable Energy leads stakeholder and customer engagement. The Smith Institute contributes machine learning and AI expertise and Smart DCC brings specialist smart metering knowledge. The University of Reading supports assessment of the project's role in flexibility and the wider energy system, and Cranfield University contributes on consumer integration and participation.

- Funded: £5,972,922 (SIF)
- Project timeline: September 2025 – September 2028
- Project partners and collaborators: SGN, Aberdeen City Council, Aberdeen City Health and Social Care Partnership, Centre for Sustainable Energy, CGI, Cranfield University, E.ON, Quarriers, Smart DCC, The Smith Institute, University of Reading
- Project lead: Rhys Williams, Project Manager

Smarter Networks Portal project page

Benefits

Whole system collaboration:

Delivered with SGN, so vulnerability and flexibility evidence is built across gas and electricity rather than separately.

Innovation from a variety of sources:

Third-party collaborators span local government, health and social care, charity, technology, academia and industry.

Customers in vulnerable situations:

Charity and health partners ground the work in the needs of customers who rely on powered care at home.

Key message

Whole system collaboration

4. Who We Work With

REACT: Rapid Evaluation Areal Connection Tool (SSEN-T)

A geographic visualisation planning tool to optimise network development.

Lead network

Scottish & Southern Electricity Networks TRANSMISSION

Partners

MapStand® olsights®

Developed over three phases (SIF Discovery, SIF Alpha and now NIA), REACT draws on partners across the energy system. In the SIF phases, SSEN-T worked with NGET, SGN and Icebreaker One, bringing electricity transmission, gas and data-sharing expertise to the tool's design.

The most recent NIA phase, delivered with MapStand and Olsights, has combined planning, geographic and utility datasets and puts electricity, gas and hydrogen networks and planned carbon capture on one map. This ensures connection decisions account for the wider system.

The current NIA phase turned the SIF output into a standalone tool and added the features planners asked for: risked capacity scoring against user-set criteria, date-ordered substation capacity build-up against transformer rating, geographic filters, a 2025–2050 time slider and daily automated data updates.

Tested on the Argyll and Bute zone against SSEN-T's own records, it supported the Network Plan 2035 work, reached TRL 8 and is now used by SSEN-T's Energy Insights Team.

- Funded: £1,080,000 (NIA), £553,671 (SIF Alpha), £169,409 (SIF Discovery)
- Project timeline: January 2025 – March 2026
- Project partners and collaborators: Olsights, MapStand
- Project lead: Jonathan Powell, Innovation Development Project Manager

Smarter Networks Portal project page

Benefits

Innovation from a variety of sources:

Merging planning, geographic and utility network datasets that had not been combined before.

Whole system collaboration:

Electricity, gas and hydrogen networks and planned carbon capture sit on the same map, so connection decisions account for the wider system.

Benefit to consumers:

Potential for £10.8m estimated lifetime net benefits from £1.4m development costs to date, through reduced curtailment, strategic reinforcement, and greater network insight.

Key message

Whole system collaboration

5.

How We Ensure Value For Money

5. How We Ensure Value For Money

From funded project to everyday use: what deployed innovation delivered for households and businesses, and how the networks avoid paying twice for the same answer.

Innovation earns its keep once it is in use. This section looks at what the networks have put into service, what that delivers for consumers, and how they avoid funding the same problem twice. The case studies in this chapter explore two key messages: (1) innovation deployment, and (2) maximising value for money.

1. Innovation deployment

Completing a project is not the end point: networks continue to track innovations into BAU and quantify their benefit, whether that be capacity released, outages avoided, reinforcement deferred, or carbon saved. SSEN-D established a dedicated Innovation Deployment team this year, successfully transitioning NeRDA 2 into BAU, where it provides near real-time network visibility that supports dynamic tariffs and contributes to more efficient and affordable decarbonisation. SP ENW's Celsius project releases capacity at existing substations by managing thermal pinch points, deferring asset replacement. SPEN-T's Project Conan (T2) brings the same approach to overhead lines: its conductor condition assessment device measures corrosion directly, reducing premature replacement and sparing consumers paying unnecessary replacement costs. NESO's Volta project showed that machine learning can forecast demand minute by minute for the control room, with confidence ranges operators can read as risk; cutting real-time forecast error by 50 MW would save around £43m a year in balancing costs, and the model is already being reused across NESO's wider forecasting.

Deployment also builds on prior innovation work to deliver value for money. SSEN-D's submissions to the ED2 reopeners aim to take innovation already proven elsewhere straight to delivery, including a Voltage Management solution built on learning from SP ENW's CLASS project. Networks are the enabler; households and businesses are the primary beneficiaries. The value of a deployed innovation reaches consumers as lower bills, fewer interruptions and faster connections for heat pumps, solar and electric vehicles, and the carbon saved counts towards both network and national level targets. NGED's EQUINOX project, now in deployment, trialled technical and commercial methods to reward households for temporarily shifting demand when they use low-carbon heating in winter without losing comfort, cutting their bills while helping networks avoid costly reinforcement.

£919m

Forecast lifetime benefit of innovation projects deployed into BAU over RIIO-2

>500,000

unit deployments of solutions from innovation projects deployed into BAU to date

8

innovation projects adopted into BAU in FY26

5. How We Ensure Value For Money

REVEAL (NESO)

Tools to make the trialling of new balancing capabilities easier and faster for NESO and industry.

Lead network

Partners

As the pace of change towards net zero accelerates, new market services need to be tested and launched far more quickly than the current route to market allows. The project investigated the feasibility of, and developed a proof of concept for, a NESO-hosted, digitally ringfenced balancing and constraint market. Working with service providers inside that sandbox, NESO could build and trial new concepts, services and solutions autonomously, accelerating delivery of its Markets Roadmap.

REVEAL gives NESO and industry a ringfenced space to simulate and test new balancing services away from live systems, lowering barriers to entry for smaller market participants and supporting the Clean Power 2030 goals. Additionally, the REVEAL team have engaged with industry to develop trial pipelines and develop further iterations of the live trial environment to enable more market participants.

- Funded: £400,000 (NIA)
- Project timeline: September 2022 – March 2025, successfully deployed in 2026
- Project partners and collaborators: Capgemini
- Project lead: Leon Walker, Governance and Insights Manager

Smarter Networks Portal project page

Benefits

New and faster market participation:
Lowers barriers to entry and faster development so smaller providers can test and refine their solutions and bring to market faster

Knowledge sharing:
Builds evidence of what works that future products and services can build on.

Key message

Innovation deployment

5. How We Ensure Value For Money

DgWLCA – Digital whole life carbon assessment (NGET)

The UK's first digital whole life carbon tool for transmission.

Lead network

nationalgrid

Electricity Transmission

Partners

MOTT MACDONALD

NGET has committed in its Environmental Action Plan to cut the carbon footprint of its construction projects and to work towards the PAS 2080 standard. The current project transforms the carbon footprint calculation to a modern digital approach including AI-supported low-carbon optimisation and intuitive, energy-specific onboarding, while retaining NGET's existing carbon databases and updating them annually.

The tool has achieved a high TRL level and has replaced the legacy tool as the standard approach across the full NGET portfolio, with business procedures and contractual requirements updated accordingly and 40 supply chain partners now tracking whole life carbon data. Over a ten-year asset life it is assumed to save 64,000 tCO2e, worth around £19m in societal value.

- Funded: £163,220 (NIA)
- Project timeline: August 2024 – August 2025, successfully deployed in 2025
- Project partners and collaborators: Mott MacDonald
- Project lead: Dr Muhammad Shaban – Lead Innovation Engineer

Smarter Networks Portal project page

Benefits

Route to BAU:
Embedded across the full NGET portfolio at TRL 8, replacing the legacy tool.

Avoiding duplication:
Builds on an existing tool and shared carbon databases, not a new platform.

Environmental benefits:
64,000 tCO2e saved over ten years, worth around £19m in societal value.

Key message

Innovation deployment

5. How We Ensure Value For Money

Artificial Forecasting – Beta (NPg)

Developing innovative AI-based approaches to augment load forecasting capability, unlocking flexibility as a reinforcement option.

Lead network

NORTHERN POWERGRID

Partners

OAKTREE POWER

ev.

FACULTY

This project tests machine learning algorithms to produce load forecasts and develop AI techniques for modelling load connections.

As DNOs transition to DSOs, the load forecasting process must become increasingly granular to support flexibility dispatch – frequency needs to increase from annual to monthly, weekly and daily, and the scope needs to expand to capture HV / LV transformation points. Given the new conditions, enhanced models and novel approaches are required to enable system flexibility and support network stability under these new conditions.

Available capacity in the network for new low-carbon loads will be freed up thanks to more effective network management, increasing the speed and lowering the cost of decarbonisation.

The project will benefit a wide range of users, including those seeking to connect low-carbon loads, flexibility providers and controllers, network customers and other electricity distribution companies.

The innovation project takes the technology TRL 4 to TRL 8, aiming at everyday forecasting use rather than a proof.

- Funded: £3,664,540 (SIF)
- Project timeline: February 2025 - February 2027
- Project partners and collaborators: Oak Tree Power Ltd, EV Dot Energy Ltd, Faculty Science Ltd
- Project lead: Neal Wade – System Forecasting Engineer

Smarter Networks Portal project page

Benefits

Cost savings for networks:

Reduction in HV / LV reinforcement cost by about 5 -10% (£3.5m-£7m p.a. for NPg, increased by a factor of 7 for all DNOs in GB)

Staff cost savings of ~£2m p.a. in NPg, increased by a factor of 7 for all DNOs.

TRL change

4 to 8

Key message

Innovation deployment

5. How We Ensure Value For Money

Getting the most from every pound of consumer-funded innovation money, spending it once, sharing the cost where we can, and stopping projects that will not pay back.

2. Maximising value for money

Innovation is funded from consumer bills, so the test is not if an innovation project works, but whether it was the best available use of funds. The nine network licensees and NESO face many of the same problems: connecting low-carbon technology, managing constraints, and monitoring ageing assets. The same idea can therefore occur in several places at once, and because innovation funding comes from consumer bills, an overlapping project spends that money without producing a new answer.

The networks use a set of mechanisms to reduce that risk. Projects and their findings are registered and searchable on the Smarter Networks Portal; ENA's innovation governance groups give the networks a forum to compare plans before funding decisions are taken; and annual innovation reporting and dissemination events put completed results in front of the other licensees. Where overlap is found the work is combined rather than repeated: one project with several network partners, shared trial sites, or one network adopting another's proven method instead of running its own trial.

SPEN-D's D-suite takes its distributed soft open point from UKPN's earlier Active Response project and its slim-design DC and AC capable smart transformer from their own LV Engine project. In this way, rather than funding either again, the project is reusing existing IP to develop a rating optimised suite of LV smart devices. NGED's HV Pinpoint is being designed to complement an existing Pre-Fix method rather than replace it, locating pre-fault events on HV underground cables precisely enough to cut reliance on test vans, so the network gains a second detection route without funding a second detection programme. NPg's MultiResilience project coordinates proven trials over two different sites to ensure rural customers have uninterrupted supply during an outage.

Sharing of test facilities, contributions from project partners and suppliers, and competition for funding all contribute to value for money for the consumer. Projects delivered with several networks also have the benefit of spreading costs over a wider customer base. Projects are reported against the problem statement they set out to address and a method that does not prove out is closed and published as a negative result, so other networks don’t invest additional funds to come to the same conclusion.

3000+

projects registered on the Smarter Networks Portal and searchable by every network

31

collaborative projects registered in FY26, run jointly rather than separately

426

project partners working with the networks on registered projects in FY26

5. How We Ensure Value For Money

PHASED SWITCH SYSTEM (NGED)

Rebalancing LV phases to release capacity and defer reinforcement.

Lead network

nationalgrid Electricity Distribution

Partners

UK Power Networks Delivering your electricity

Low Carbon Electric

UNIVERSITY of STRATHCLYDE PNDC

The Phased Switch System (PSS) dynamically reconfigures the phases of a low voltage feeder to cut phase imbalance. That lowers the load on the most heavily loaded phase and the risk of incorrect fuse operations, improves use of the cable's capacity so reinforcement can be deferred, reduces losses and the CO_2 that goes with them, and eases the voltage problems that can stop customers taking part in flexibility markets.

As customers adopt low-carbon technologies, phase imbalance threatens hosting capacity and triggers reinforcement with PSS being a cheaper alternative.

The SIF Beta project starts from a prototype already trialled to TRL 6 by UKPN under NIA, so consumer funding goes on market readiness rather than repeating the proof, and lab testing runs at PNDC, a shared industry facility, instead of building test capability for one project. A planning tool developed alongside it shows where the technology delivers most benefit, so any roll-out can be targeted rather than universal.

- Funded: £3,430,000 (SIF Beta)
- Project timeline: September 2024 – January 2028
- Project partners and collaborators: UK Power Networks, LCE, Nortech, PNDC
- Project lead: Jacob Lynch – Innovation Engineer

Smarter Networks Portal project page

Benefits

Financial:

Targeted roll-out forecasts a net lifetime benefit of £230m and a 45-year NPV of £371m, from fewer unintended fuse operations and deferred reinforcement.

Environmental:

Net savings of 3 TWh of losses over the devices' lifecycle and 24ktCO2e of carbon.

Customer access to markets:

Fewer voltage problems should let more customers earn from flexibility and smart charging, where savings can run to several hundred pounds a year.

Key message

Maximising value for money

5. How We Ensure Value For Money

VEST Enhancement (SPEN-D)

Finding the households the energy transition risks leaving behind, postcode by postcode.

Lead network

SP Energy Networks

Partners

SIRIO

The VEST Enhancement project upgrades SPEN-D's Vulnerability in the Energy System Transition (VEST) tool rather than starting from scratch. The improved tool better considers personal circumstances and the physical suitability of customers' home environments.

The refreshed index adds property-level barriers to low-carbon technology, such as no off-street parking for a charge point or no space for a heat pump. Modelling now covers around 96,000 postcodes in Scotland and over 81,000 postcodes in England and Wales and produces adoption scores for solar PV, heat pumps and battery storage together with the drivers and blockers behind each.

Insight reaches users through an interactive mapping platform for SPEN-D and its partners, with a customer-facing portal concept so households can explore their own options and funding routes.

- Funded: £545,000 (NIA)
- Project timeline: July 2025 – September 2026
- Project partners and collaborators: SIRIO Multilateral Strategies Ltd
- Project lead: Mikaelle Lopes Diniz – Project Manager

Smarter Networks Portal project page

Benefits

Value for money:

£545k of cost against £954k-£2.35m of modelled net benefit.

Benefit to consumers:

Better targeting cuts delivery cost and widens access to EVs, heat pumps and solar.

Key message

Maximising value for money

6.

Continuing the Cycle

6. Continuing the Cycle

6.1 Opportunities Ahead

RIIO-3, the current electricity transmission price control period, began in April 2026, with final determinations announced by Ofgem in December 2025. The final determination confirmed £500m for the SIF and £164m of NIA funding for electricity transmission, along with an important shift in emphasis from RIIO-2 to RIIO-3 from trialling new ideas to deploying proven ones with the SIF gaining a new Deployment Phase to fund roll-out of innovation into business-as-usual. Draft determinations for the next electricity distribution price control period due to start in 2028, are yet to be announced.

This was accompanied by the release of the SIF challenges for 2026 to 2033 in May 2026 via the Networks reimagined: Designed to deliver for customers and growth report from the Energy Network Innovation Taskforce. These challenges show a clear focus on innovation that leads to a highly operational electricity network which improves performance and delivers better outcomes for consumers, including reduced costs:

Innovation challenge 1: Industrial and business connection acceleration

Innovation challenge 2: Faster build and maintenance

Innovation challenge 3: Instant use domestic energy devices

Innovation challenge 4: Eliminating energy outages

Innovation challenge 5: Decentralised system balancing

At the same time, networks are aligning their innovation efforts with broader system goals, such as those outlined in National Grid's Operational Objectives, which take a whole-system view of progress. The most recent publication of the Electricity Networks Innovation Strategy reinforces this approach. It provides a unified framework to innovate in ways that support the UK's low-carbon transition and deliver value to customers.

As we enter RIIO-3, projects are becoming increasingly iterative over extended periods of time and across funding streams. For example, SP ENW's Net Zero Terrace, detailed further on page 15, began as a SIF Discovery and Alpha project, then moved to NIA to develop the solution further, and is now progressing towards a SIF Beta application. Future projects will also continue this trajectory to ensure that learnings from past years are taken forward and more projects reach business-as-usual deployment.

Looking ahead, networks will be expected to show how innovation projects can lead to new solutions being deployed and the real-world benefits they will bring to consumers, with cost and reliability being key drivers in this regard.

6. Continuing the Cycle

6.2 Key Learnings

During the FY26 period, networks registered 139 new projects, closed 81 projects and successfully integrated 8 solutions into business-as-usual operations[1]. As projects progress, networks continue to seek opportunities to embed innovative solutions into day-to-day operations.

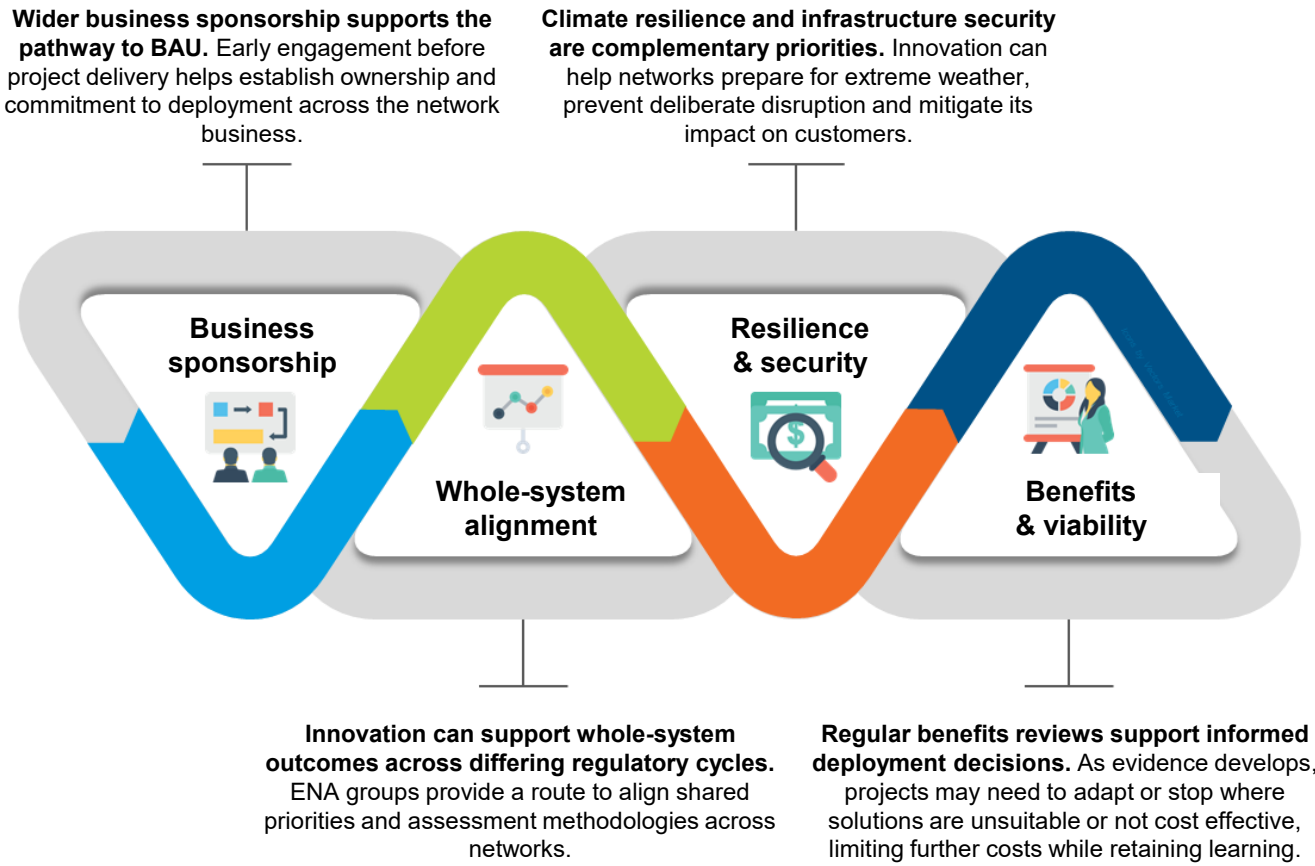
However, this process is not always straightforward. Innovation takes time, and the path to BAU can be complex. Networks may face strategic, policy, or operational challenges that require flexibility and persistence. For example, the EQUINOX project ran over multiple years and encountered challenges with changing policy, technology and operational landscapes that had to be managed through iterative trial design and regular horizon scanning. Lengthy onboarding for project partners, particularly small businesses, can also hinder progress. Many projects have made use of the Energy Innovation Centre to reduce this admin barrier for resource-constrained innovators.

Not every project delivers a benefit that can be measured in pounds, carbon or customer minutes lost. Some projects prove that an approach does not work, that the technology is not ready, or that market or regulatory conditions are not in place.

These results, while harder to quantify, still have value and can lower the risk of later business-as-usual decisions. In such instances, it is important to fast fail projects to avoid sunk costs. UKPN is trialling a benefits readiness framework within their governance to review project cost benefit analyses twice annually to identify such instances early.

We've summarised the key challenges and lessons learned in Figure 6.1, offering insights that will help shape future innovation across the sector.

Figure 6.1 BAU challenges and lessons



[1]This imbalance between the number of projects launched / registered and the number completed is to be expected for a period nearing the end of a price control period, as project registration tends to be front loaded for a particular period of this type.

6. Continuing the Cycle

6.3 Recommended and Future Actions

Embedding innovation into BAU requires clear communication, strategic planning, and industry-wide support. This section outlines the key enablers that help networks integrate innovation outcomes into day-to-day operations.

A strong focus on communication and developing plans for deployment early on in a project is essential, ensuring that teams across the business understand the value of proposed changes and are invested in successful deployment. Networks attend regular project notification meetings, chaired by ENA, where collaboration helps highlight upcoming projects and avoid duplication. DNOs will also show how they aim to avoid project duplication in the Innovation Appendices they will submit as part of the new ED3 price control.

Support from industry stakeholders is vital. The proposed new structure for the Innovation Measurement Framework (IMF) will require networks to capture benefits from deployed projects, including non-financial ones such as environmental impact. This should allow networks to better articulate the value of innovation, particularly to senior leadership and the wider energy sector. Tracking knowledge generation as a benefit is also especially important for low Technology Readiness Level (TRL) projects, which play a critical role in testing feasibility but can be harder to quantify due to their experimental nature.

Unlocking innovation for business-as-usual requires targeted funding and flexible regulation. Additional funding dedicated to deploying innovative solutions into BAU operations would help networks to overcome barriers such as resource constraints, policy limitations and organisational practice. To support this, Ofgem has introduced a beta version of the Energy Regulation Sandbox, which helps innovators trial new propositions without some of the usual rules applying, and are also planning to launch the Future Regulation Sandbox, an innovative policy instrument to test and trial changes to the energy rulebook in a controlled environment before implementing them. This initiative could help mitigate some of the regulatory barriers to innovation.

However, the specifics of deployment are often outside of the scope of innovation projects, and networks still struggle to quickly assemble the necessary resources. Additional policy support through relaxed licence obligations, the ability to use a more simplified/agile policy process and clear communication from government of future policy direction have also been highlighted as important avenues to boost BAU deployment.