SP Energy Networks | DSO

DSO: Past Performance and Future Focus

2024/25

Contents

Executive Summary

Delivering Impact Through Collaboration, Innovation and Data

This year, we moved further and faster – driven by insight and powered by the partnerships we've built across our regions.

As our energy system continues to evolve at pace, our role as a Distribution System Operator has never been more critical. Stakeholders told us they needed faster connections, more flexible services, better access to data, and a stronger voice in planning.

We responded:

We accelerated over 90 connections, unlocking 2.3GW of capacity – in some cases, up to 10 years ahead of schedule.
We deferred 108.5MW of reinforcement through smart use of flexibility – saving time, cost, and carbon.
We grew flexibility participation tenfold, dispatching 100% of contracted services and bringing new providers into the market.
And we supported over 2,000 local planning studies – helping councils shape practical, data-driven strategies for decarbonisation.

Together, these actions delivered £10m in-year net benefits, with a forecast of £563m in long-term value across ED2 and beyond.

Our DSO strategy is working – not because it looks good on paper, but because it's rooted in what our stakeholders tell us matters most. This submission outlines the progress we've made, the partnerships behind it, and the impact we're enabling across every part of the system.

We're proud of what we've achieved – and even more ambitious about what comes next.

Welcome from our leaders

"This year brought a defining moment for our sector — from the introduction of CP2030 and the formation of NESO, to renewables generating more than half of Great Britain's electricity for the first time. These are more than milestones; they're signals that our future energy system is being built now. Our Distribution System Operator (DSO) responsibilities are central to making that system real – and I'm proud of how our teams and stakeholders have responded, together."

NICOLA CONNELLY, CEO

"We've made measurable, meaningful progress this year — from unlocking early connections to expanding flexibility and improving network data. These aren't just operational wins. They are the result of deliberate collaboration, stakeholder insight, and a drive to create real-world impact. I want to thank every customer, partner and colleague who's helped make this progress possible — and I look forward to what we'll deliver together next."

NIA LOWE, HEAD OF DSO

Our 2024/25 DSO highlights

How we create value through our role as a Distribution System Operator (DSO)

What we delivered:

- 2.3GW capacity enabled across 91 customer projects
- 108.5MW of reinforcement deferred
- Flexibility provider growth – from 3,577 to 33,394 registered assets
- 5,391 LV monitors deployed
- Over 2,000 LAEP and LHEES optioneering studies supported.

Why it mattered:

- Faster, more affordable connections – supporting local growth and clean energy development
- Flexibility used to save time, avoid disruption and reduce investment risk
- A more inclusive, accessible system – with community-scale and SME participation
- Greater networks visibility to support planning, prevention and optimisation
- Local Authorities empowered with trusted data for EV, heat and solar rollout.

This year, our work has delivered meaningful benefits for customers, communities, and the wider network:

£10.0m *in-year net benefits*

£50.5m *benefits through the rest of ED2*

£563.1m *long-term net benefits*

WHO WE WORK WITH

Our stakeholders include:

Businesses:
from small enterprises to large industrial and commercial customers.

Clean energy developer:
across solar, wind, battery, and renewable projects.

Communities and domestic customers:
households and local areas across our regions.

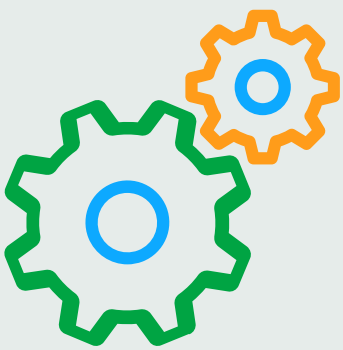
Critical services:
hospitals, emergency services, and essential infrastructure.

Data users and researchers:
accessing our Open Data Portal for analysis and planning.

Flexibility service providers:
helping us manage network demand and supply.

Government bodies:
Local Authorities, devolved governments, and regional public bodies.

Network operators:
distribution and transmission companies we coordinate with.



Enabling capacity for customer connections, growth, and decarbonisation

Unlocking the system to support Net Zero – faster and smarter.

Connections don't just power projects — they unlock homes, jobs, transport, and local prosperity. That's why we've focused on accelerating connections and releasing capacity, while making smarter use of the network we already have.

We listened to developers, Local Authorities, and communities who told us delays and costs were real barriers to progress. In response, we've rolled out tailored solutions that are cutting waiting times by years — without compromising system resilience or fairness.

WHAT WE DID

In 2024/25, we made it quicker and less expensive for energy projects to connect to our network.

Our 2024/25 impact at a glance:

91 customer projects connected using smart and flexible approaches – delivering 2.3GW of capacity.
Connections accelerated up by 10 years in busy areas, with flexible options available.
40 Local Authorities and over 20 regional bodies supported with over 2,000 optioneering studies for EV charging, heat pumps, and renewable generation.
5,391 low-voltage replace with monitors installed – unlocking capacity and improving planning precision.
Led industry-wide reforms for storage connections, enabling consistent access and unlocking up to £400m in long-term value.

WHAT THIS MEANS FOR YOU, OUR STAKEHOLDERS

For clean energy developers:
faster connections for solar, wind, and battery projects mean lower risk and earlier delivery of both economic and environmental benefits.

For Local Authorities:
you can reinforce your Local Heat and Energy Efficiency Strategies (LHEES) and Local Area Energy Plans (LAEPs) with greater network context. We help you understand how your decarbonisation plans affect the grid – and help you understand the potential costs.

For network planners and developers:
better visibility of network capacity means you can make smarter decisions, sooner. Our improved data and planning tools show where capacity exists – and what solutions may be needed.

For communities:
faster connections mean renewable projects and local energy infrastructure can go live sooner – boosting local economies and supporting decarbonisation goals.

OUR WORK IN ACTION

Rigmuir Wind Farm: connecting years ahead of schedule

We used a Load Management Scheme to connect a 13.5MW wind farm in South Lanarkshire years ahead of schedule. By forecasting curtailment and offering a tailored flexible connection, we helped avoid major reinforcement work – saving the project up to six years in delays.

"The use of a LMS was fundamental to the early connection of Rigmuir Wind Farm. The solution was put forward, and ultimately implemented, by SPEN as a means of avoiding transmission related delays and costs associated with significant reinforcement works. SPEN were able to support in estimating levels of curtailment, allowing CE as developer to make an informed investment decision – balancing reduced yield against increased capital expenditure and a delay to connection of up to six years."

Dean Robson, Managing Director, Clean Earth Energy

Creating £400m in value through smarter storage connections

We led the national workgroup on reforming how electricity storage connects to the distribution network, working closely with all network companies and NESO. The result: consistent access rights for storage across Great Britain, and new planning rules that improve coordination between transmission and distribution.

These changes have reduced the need for upfront investment in new storage and made better use of the existing network. By December 2024, over 62GW of storage connections had been offered across GB – with 28GW accepted. Independent analysis by Oxera estimates the reforms could deliver up to £400m in benefits by 2040.

NESO
National Energy System Operator

Local Authority optioneering: supporting smarter energy planning

Fife Council partnered with our Strategic Optimisation Team to explore which option would best meet local needs: a heat network or individual heat pumps.

By combining detailed network data with advanced modelling, we helped pinpoint the most cost-effective option based on real-world grid capacity. This coordinated approach gave Fife Council confidence in their technology choice and strengthened their funding bid.

In 2024/25, we provided similar support to 40 Local Authorities, covering more than 2,000 sites – helping shape practical, data-driven decarbonisation strategies across our regions.

Helping customers to participate in a flexible energy system

Opening up flexibility, and the future, to more people, more easily.

Flexibility is no longer niche. It's now a vital part of how we keep the network running reliably, affordably, and sustainably. And it only works when the market is open, clear, and fair.

That's what we set out to achieve this year — by removing barriers to entry, simplifying processes, and helping a wider range of stakeholders take part. The result? More participants, more services dispatched, and a more responsive system overall.

WHAT WE DID

We've made it easier for more customers to take part in flexibility markets – opening the door to smaller providers, community projects, and a wider range of technologies. Our goal: a more inclusive, responsive, and effective system.

Our 2024/25 impact at a glance:

Publishing our first Market Prospectus, offering clear insight into future flexibility opportunities.
Removing minimum thresholds for participation, allowing smaller and community-scale providers to join flexibility markets.
Introducing month-ahead markets to replace longer-term contracts – making participation more predictable and accessible.
109 one-to-one surgeries and attendance at 25 public events to onboard, support and empower stakeholders.
Participation surged from 3,577 to 33,394 registered assets across 28 providers.
Using flexibility to support planned outages and extreme weather events.

Our shift to shorter-term markets has made a big difference. We now dispatch 100% of contracted flexibility services (up from 44%), and response rates to dispatch instructions have increased from 11% to 83%.

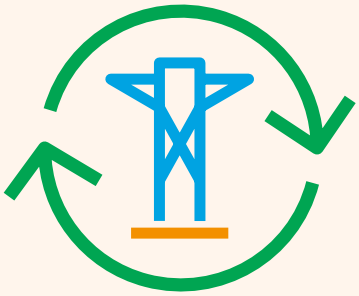
WHAT THIS MEANS FOR YOU, OUR STAKEHOLDERS

For flexibility service providers:
shorter tender rounds open up opportunities to take part. Providers can also make better informed decisions, bidding closer to real time as market conditions become better known. At the same time, standardised agreements make it easier for stakeholders to take part across multiple markets.

For Local Authorities, SMEs, and aggregators:
earn revenue by helping to manage grid demand. With minimum thresholds removed, even small-scale flexibility can take part, opening new income opportunities for local businesses and community energy projects.

For all customers:
we're using more flexible solutions to keep the network reliable during maintenance or extreme weather. That means fewer outages, and speedier restoration when they do happen.

For the energy transition:
a fairer, more accessible system – with new opportunities for entrants and community-scale projects. This helps share the benefits of clean energy more widely, supporting local participation and ownership.



OUR WORK IN ACTION

Successful market onboarding

In June 2024, we moved to a month-ahead operating model for our flexibility markets, making it easier for providers to participate with greater certainty about their available assets.

Improving market transparency

We've made it easier to understand our flexibility requirements through clear market signals showing the volume and value of flexibility services needed across our licence areas. Our interactive heatmaps show requirements by location, while our Market Prospectus sets out how to take part in our markets.

Removing barriers to entry

We've highlighted the benefits of participating in our services, and supported potential providers to navigate the onboarding process.

Companies like ev.energy and E.ON joined our markets in 2024/25 after receiving practical support from our team. We worked closely with them on market processes and contracts, guiding them through technical setup and helping them access our application programming interface (API) for automated data access.

E.ON's Head of Flexibility highlighted our clear communication and collaborative approach, noting that our customer-focused support was central to their successful participation.

"The month-ahead market allows us to participate with a much shorter delay, creating more value for consumers while responding to the short-term flexibility needs at SPEN. We consider the addition of month ahead to be a very positive addition to the DSO flexibility landscape."

Pelle Jacobs, Axle Energy

Flexibility prospectus: improving market transparency

We launched our first interactive Flexibility Prospectus feature page to give stakeholders clear visibility of upcoming flexibility opportunities. The platform provides:

- Heatmaps showing location-specific flexibility needs
- Forecasts of expected contract volumes and indicative pricing
- Links to live and upcoming flexibility tenders
- Insights into procurement plans through to 2028.

Since launch, 158 users have accessed the platform – using it to inform investment decisions and plan their participation in the flexibility market.

Providing easy access to accurate and timely data

Better decisions start with better data – and we're making it easier than ever to access, trust and use.

For our stakeholders, quality data is the foundation of progress. Whether you're designing a local energy plan, choosing a development site, or bidding into flexibility markets, you need accurate, timely information – and the tools to make sense of it.

WHAT WE DID

This year, we've made our data richer, more accessible, and more user-friendly. We've also responded directly to your feedback — launching new datasets, improving interfaces, and giving you clearer insight into the shape and capacity of our network.

Developments this year include:

10 new datasets with 31 new data tables – on our Open Data Portal, bringing our total to 98 data tables.

Smart meter and LV monitoring data – we launched specific datasets providing insights into our LV network.

Five new interactive dashboards – a faster, simpler way for users to gain insights from our data.

Published quality assessments across 73 data tables – dimensions of validity, completeness, and uniqueness.

Data quality improvements – for example, we have increased the validity of our Embedded Capacity Register from 41% to 85%.

Improving our flagship LANIT platform – which supported over 2,000 LCT optioneering assessments for our Local Authority stakeholders.

Support material – including videos which explain how to access and navigate our Open Data Portal.

Methodologies for our datasets – with clear overviews of our data collection, processing, and governance.

Risk assessments for all Open Data Portal datasets – providing our stakeholders with visibility of any mitigations implemented.

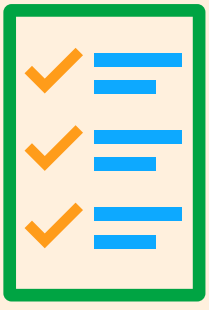
WHAT THIS MEANS FOR YOU, OUR STAKEHOLDERS

For local planners:
fast, accurate decisions based on trusted network data. Our tools help you understand network constraints and opportunities before committing to infrastructure investments.

For developers:
explore locations, compare capacity availability, and reduce the cost and risk of connection applications. Better data means better site selection and more accurate project planning.

For researchers and analysts:
a standardised and consistent approach across datasets – making it easy to combine with existing tools and analytical frameworks.

For flexibility providers:
data is visual, with clear sight of network constraints and opportunities helping inform bidding strategies and investment decisions.



OUR WORK IN ACTION

LANIT: supporting Local Authorities with smarter energy planning

In 2024/25, Local Authorities used our Local Authority Network Insight Tool (LANIT) to carry out self-service optioneering studies. The tool brings together low and high voltage network data with real-time capacity information, helping councils quickly model plans for EV charging, solar, and low-carbon heat projects.

LANIT provides:

- **Visual maps** of cables, substations, and available network capacity
- **Connection cost estimates** tailored to specific project needs
- **Reinforcement assessments** to highlight any necessary upgrades
- **Support for sites** with demand up to 1MVA.

By giving Local Authorities direct access to network data, LANIT makes it quicker to plan projects, reduces repeat data requests, and helps users make more informed decisions – all of which supports faster progress to local decarbonisation.

Improving the Embedded Capacity Register – increasing data validity from 41% to 85%

We carried out a full review and upgrade of the Embedded Capacity Register (ECR). The improvements have made it far more useful for developers, system operators, and flexibility providers – as well as providing insights into the connection queue.

Key improvements included:

- **Data cleansing** – removed 199 duplicate or terminated sites
- **Completeness** – reduced missing 'Energy Source' entries by 85% and missing capacity data by 91%
- **Automation** – introduced processes for reliable monthly updates
- **Overall improvement** – increased overall data validity from 41% to 85%.

These changes have made the Embedded Capacity Register a much more reliable tool for investment planning and operational decision-making across the electricity system.

Open Data Portal growth and engagement

User satisfaction is high, with 83% indicating they would recommend the Open Data Portal to others. Our user base has also grown dramatically, from 401 registered users in March 2024 to 2,354 by March 2025.

We've responded to user feedback by introducing:

- **Direct stakeholder support** – fulfilled 186 individual data requests with an average 11-day turnaround
- **Enhanced engagement channels** – gathered feedback across five customer and stakeholder touchpoints, including personal collaboration with more than 220 stakeholders, and our Open Data survey
- **Our Open Data Roadmap** – developed based on your survey responses and feedback, outlining our commitment to publication of new datasets and visualisations
- **Step-by-step support videos** – for new users
- **Re-use functionality** – allowing users to showcase their applications
- **Improved feedback forms** – so we can further improve the ways users access, reuse, and build upon our data.

Operating a reliable and decarbonised network

Resilient today, ready for tomorrow – running the network smarter, cleaner and with more visibility.

As more renewables and local energy resources connect to our system, the challenge is no longer just keeping the lights on – it's doing so intelligently, affordably, and sustainably.

WHAT WE DID

We've strengthened how we run the network to handle greater complexity, as more distributed energy resources – like solar, wind, and storage – connect to the system.

Our 2024/25 impact at a glance:

Used flexibility to support both planned outages and extreme weather events.
Installed 5,391 LV monitors – expanding predictive maintenance capabilities.
Used smart meter data and machine learning to identify 154 potential faults – with 129 resolved before causing customer disruption.
Strengthened collaboration with NESO – through real-time data sharing and joint operational planning.
Established operational ICCP link – with NESO for our SPD area, with a link for the SPM area being delivered.

Our updated Network Support Room brings together real-time data from across all voltage levels. With the help of automation and machine learning, it gives our teams the insights they need to make quicker, more informed decisions.

WHAT THIS MEANS FOR YOU, OUR STAKEHOLDERS

For all customers:
fewer outages and faster repairs, especially in remote or high-risk areas. Our predictive approach means many faults are resolved before you notice any impact.

For businesses and critical services:
improved reliability reduces the risk of costly interruptions. Our flexibility services provide additional backup options during planned maintenance or emergency situations.

For the wider energy system:
better coordination with NESO and other network operators improves overall system efficiency and reduces costs that benefit all energy users.

For local communities:
enhanced monitoring and predictive maintenance are making the network more reliable for local communities – helping to support everyday life, economic activity, and long-term resilience.

OUR WORK IN ACTION

Storm Darragh response: restoring power 40 hours early

When Storm Darragh hit in December, 15,000 of our customers lost power during some of the worst winter weather we'd seen. Faced with extensive damage and the prospect of families and businesses being without electricity for days, we had to act fast.

Thanks to a flexibility contract we'd arranged with Statkraft, we were able to dispatch 20MW from the Rheidol hydro power station – restoring power a full 40 hours earlier than traditional network repairs would have allowed. With communications knocked out by the storm, our teams coordinated the response using satellite phones, working around the clock in incredibly challenging conditions.

This wasn't just about keeping the power flowing – we were protecting a regional hospital and ensuring vulnerable customers stayed warm and safe. It showed how powerful these flexibility partnerships can be when communities need us most.

Real-time control room coordination improves system operations

We've set up an Inter-Control Centre Communication Protocol (ICCP) link between our SPD control room and NESO. This direct connection allows real-time sharing of distributed energy resource (DER) data and operational information.

The improved coordination supports:

- More efficient dispatch of flexibility services
- Better handling of system constraints
- Faster, more effective responses to system events
- Fewer conflicts between transmission and distribution operations.

A second ICCP link for our SPM area is due for completion in October 2025, bringing these improvements to our entire network.

Network Support Room: advanced analytics in action

Our upgraded Network Support Room uses data from LV monitors, smart meters, and other network sensors, to provide unprecedented visibility of network performance.

The team uses machine learning to:

- Identify emerging constraints before they cause problems
- Optimise the dispatch of flexibility services
- Support predictive maintenance programs
- Enhance coordination between control room operations

This approach has played a key role in managing the growing complexity of our network, as more distributed energy resources connect and customer demand becomes more varied.

Fault prevention: addressing issues before they arise

Our use of low voltage (LV) monitors and machine learning is changing how we maintain the network – shifting from reactive fixes to proactive prevention. In 2024/25, we identified 154 potential faults and acted in advance.

At 129 of these locations (84%), we completed repairs before any customers experienced a power cut – including one industrial site where avoiding an unplanned outage prevented significant financial disruption.

This predictive approach delivers clear benefits:

- Fewer customer minutes lost
- Lower emergency response costs
- More efficient resource planning
- Higher customer satisfaction

What's next?

Staying ambitious, staying accountable, staying connected.

The energy system is changing fast — and so are the expectations on us as a DSO. That's why we're already acting on the insight you've shared to shape what comes next. We're entering a new phase of delivery with sharper focus, broader collaboration, and stronger tools to help you lead the transition where it matters most: on the ground.

WHAT TO EXPECT IN 2025/26

Growing our flexibility markets

We're hosting our first-ever SPEN Flex Summit in Liverpool during September 2025, bringing together flexibility providers from across our regions – including those who are merely exploring their options.

This collaborative event will share our vision for flexibility markets into the next price control period. Expect plenty of sessions aimed at new entrants, such as community energy groups and Local Authorities.

In winter 2025/26, we're also launching a trial of day-ahead flexibility markets. This will move us even closer to real-time delivery; you may find this trial especially helpful if month-ahead contracts are too distant to support your operational planning.

Making our data even more accessible

Many of you have asked for live outage data on our Open Data Portal – so we're launching this feature later in 2025. We're also improving our data visualisation tools, including the launch of flexibility activity dashboards that will help you make better investment decisions.

We recently held our 'Hands on with our data' webinar. This webinar explored our Flexibility and Network Flow & LTDS datasets in detail, discussed data quality improvements and demonstrated how stakeholders can access and interact with our data. There was also the opportunity to ask questions regarding our Open Data Portal. On top of this, we've scheduled a data hackathon for later in 2025 – the perfect chance to explore creative ways of using our network data in your projects.

Local energy planning

The second version of our Local Authority Network Insight Tool (LANIT) will launch later in 2025. This will give Local Authorities even more of what you need to plan your own EV charging, heat pump, and renewable energy projects. As ever, it's supported – and augmented – by our Strategic Optimisation Team.

Regional Energy Strategic Plan (RESP)

We're expanding our regional engagement to support the Regional Energy Strategic Plan (RESP) and preparations for the next price control period. This means your local energy plans will be reflected in an even wider range of forecasts and publications, amplifying your voice in shaping network developments.

Here's what one of our partners says about our approach:

"We welcome the transparency, collaboration, and positive approach SPEN bring to working with us, including through joint workshops with our shared regional stakeholders. This engagement really enhances coordination between transmission and distribution, supporting longer term network planning and collective decarbonisation efforts."

Ben Haggerty, Head of Whole Systems Infrastructure Development & Delivery, National Grid Electricity Transmission

Your insight keeps driving our direction

COMMITTED TO SUPPORTING YOU

Whether you're a Local Authority designing decarbonisation projects, a developer exploring connection options, or a flexibility provider looking to participate in the market, we're here to support your ambitions.

HOW TO GET INVOLVED

If you're involved in low-carbon technologies, local energy planning, or developing new flexibility solutions – we want to hear from you. We're not waiting for next year's DSO survey to listen. We embed stakeholder feedback into our reporting and we are using it to shape everything from procurement strategy to community partnerships. We want to work with you to build a smarter system that works for all.

Flexibility services:
email Flexibility@spenergynetworks.co.uk to explore opportunities or arrange a consultation.

Data and network planning:
email opendata@spenergynetworks.co.uk with your data queries, visit our Open Data Portal for tools, insights, and resources.

General DSO enquiries:
contact us at DSO@spenergynetworks.co.uk

Connection discussions:
use our standard connection processes, with enhanced DSO support throughout.

Discover and take part in events:
as well as provide feedback on our projects, using our Engagement Portal.

Glossary

API (Application Programming Interface)
Protocols that allow software applications to communicate and share data with each other.

CMZ (Constraint Management Zone)
Regional platforms that manage real-time network operational actions and distributed energy resource curtailment.

CP2030 (Clean Power 2030)
target for achieving clean electricity generation by 2030.

DER (Distributed Energy Resource)
Small-scale electricity generation, storage, or demand management technologies connected to the distribution network, such as solar panels, batteries, or smart appliances.

DSO (Distribution System Operator)
Responsible for operating and optimising the electricity distribution network, managing data, and facilitating markets for flexibility services.

ECR (Embedded Capacity Register)
A database containing information about electricity generation connected to the distribution network.

ED2 (RIIO-ED2)
The current price control period for electricity distribution networks, running from 2023 to 2028.

ICCP (Inter-Control Centre Communication Protocol)
A communication standard that enables real-time data exchange between different electricity network control rooms.

LAEP (Local Area Energy Plan)
Plans developed by Local Authorities to guide their transition to clean energy and achieve Net Zero targets.

LANIT (Local Authority Network Insight Tool)
Our online tool that allows Local Authorities to assess network capacity and potential connection costs for their energy projects.

LHEES (Local Heat and Energy Efficiency Strategies)
Scottish Local Authority strategies for improving energy efficiency and decarbonising heat in their areas.

LMS (Load Management Scheme)
Systems that manage electricity generation and demand to work within network capacity limits.

LV (Low Voltage)
The part of the electricity network that supplies power directly to homes and small businesses, typically at 230 or 400 volts.

MVA
Megavolt-ampere, a unit of electrical power.

MW
Megawatt, a unit of electrical power.

NESO (National Energy System Operator)
The organisation responsible for operating Great Britain's electricity and gas transmission systems.

SPD (SP Distribution)
Our electricity distribution license covering central and southern Scotland.

SPEN
SP Energy Networks.

SPM (SP Manweb)
Our electricity distribution license covering North Wales, Merseyside, Shropshire, and parts of Cheshire.

spenenergynetworks.co.uk

SP Energy Networks | DSO