SP Energy Networks | DSO

# DSO Performance Panel Submission 2023/24







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#### 23/24 DSO Performance Parlet Submission

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#### Who we are

We are SP Energy Networks. We own and operate the electricity distribution network in Central and Southern Scotland (our SP Distribution network), and in North and Mid-Wales, Merseyside, Cheshire, and North Shropshire (our SP Manweb network). It is through these two networks of underground cables, overhead lines, and substations that we provide our 3.5 million customers with a safe, reliable, and efficient supply of electricity.

#### The role of a DNO

Historically, a Distribution Network Operator (DNO) is responsible for keeping the lights on. It is the DNO's responsibility to make sure that the network is sufficiently large and inherently safe, and that the infrastructure is in place to distribute electricity. However, the way that energy is generated and used is changing. New low carbon technology is being adopted in the transition to Net Zero, which is changing the nature of supply and demand, and leads to the need for the electricity system to be managed in a much more dynamic way.

In addition, digital capabilities are rapidly developing, creating a wealth of new data and information. Every home and small business that has a meter is being offered the opportunity to install a smart meter. Over time, smart meters will provide significantly more information about how energy is being consumed, couple this with new and more dynamic technology on the network and the whole way that the distribution system will function and be managed will change radically.

#### The role of a DSO

A DNO does not just decide to become a Distribution System Operator (DSO), it is a long-term transition which enables our Net Zero agenda and supports the realisation of our <u>Just Transition Strategy</u> – ensuring that no one is left behind in the energy transition.

Our transition is driven by the needs of our stakeholders, delivering benefits for the communities we serve, and realising value for our customers. Since the publication of our first DSO Vision in 2016, we have taken an industry leading role in developing DSO solutions. We have established relationships with flexibility providers, local authorities, distributed generators, and academics, and have delivered real change through collaborations with stakeholders, setting many of the standards which are being rolled out across the industry. This report sets out how we are continuing our journey, delivering our <u>RIIO-ED2 DSO Strategy</u>, and how we are meeting and, in some cases, exceeding Ofgem's baseline expectations.

**SP** Distribution

SP Manweb



# Ofgem's baseline expectations

In RIIO-ED2, Ofgem introduced the DSO incentive to drive licensees to more efficiently develop and use their network using alternatives to traditional network reinforcement. The DSO incentive defines the three roles, five activities, and 23 expectations which DSOs must deliver in order to meet the requirements set out in their licence, and to potentially receive an incentive reward during the price control period.

#### Planning and Network Development

- 1.1.1 Define and develop enhanced forecasting, simulation, modelling and monitoring.
- 1.1.2 Submit a Network Visibility Strategy
   cover the use of all sources of network
  data including direct measurement from
  monitoring roll-out, smart meter data, data
  analysis, modelling, third-party data.
- 1.1.3 Have in place standard and effective processes for sharing network planning information with other network licensees, including the GB System Operator, network users and other interested parties.
- 1.1.4 Have in place transparent and robust processes for identifying and assessing options to resolve network needs, using competition where efficient.

#### 2 Network Operation

- 2.1.1 Improve network visibility and identification and sharing of operability constraints, including publishing this data to help avoid conflicting actions being taken by other network and system operators.
- 2.1.2 Submit a Network Visibility Strategy and this should cover the use of all sources of network data including direct measurement from monitoring roll-out, smart meter data, data analysis and modelling, and any other third-party data sources.
- 2.1.3 Provide the GB System Operator with information across timescales about the DER it is planning to instruct to dispatch.
- 2.1.4 Gather sufficient information on DER characteristics and parameters to provide information and inform decisions to secure against events that could lead to disconnection of DER.
- 2.1.5 Make available operational data that supports network users and other relevant stakeholders to make better decisions about how to use the network.
- 2.2.1 DNOs to have and regularly review a decisionmaking framework for when DER are instructed to dispatch in real-time.
- 2.2.2 DNOs shall facilitate secondary trading of distribution flexibility services and curtailment obligations.
- 2.2.3 DNOs to introduce clear processes for the design, development, and communication of the decisionmaking framework.
- 2.2.4 DNOs to develop efficient, scalable dispatch instruction infrastructure and avoid proprietary systems.

#### 3 Market Development

- 3.1.1 Collate and publish as much relevant data and information as reasonable that will help market participants identify and value opportunities to provide network services to DNOs and take market actions that support efficient whole system outcomes.
- 3.1.2 Develop strategies to collate and publish more helpful information, wherever possible consistently and in coordination with other network licence holders, and communicate this clearly.
- 3.1.3 Regularly and actively engage with market participants to understand what data and information is helpful to support market development.
- 3.1.4 Tailor both their information provision and engagement approaches to reflect different needs of potential market participants, including groups in vulnerable situations.
- 3.1.5 Ensure the information they publish is as accurate and unbiased as reasonable (i.e. correct at time of publication, as close as possible to the actual value and not skewed in any direction).
- 3.2.1 Have clear processes in place for developing and amending distribution flexibility services products, contracts, and qualification criteria, that are, wherever possible, standardised.
- 3.2.2 Identify the optimum combination of longer and shorter term lengths of markets and contract lengths reflecting the network need.
- 3.2.3 Make available the necessary data to enable secondary trading, for example capacity and other peer-to-peer trading.
- 3.2.4 Market support services, such as pre-qualification, creditchecking and settlement must enable simple and cost-efficient participation in markets.
- 3.2.5 Introduce proportionate measures, developed with stakeholder engagement, to identify and address actual and perceived conflicts between DSO and network ownership roles or other business interests.



## Our year in summary

Since the publication of our first DSO Vision in 2016, we have taken an active and industry leading role developing DSO solutions, delivering real benefits for our customers, our stakeholders, and our communities.

We recognise that DSO is a massive transition for us, for our industry, and for our customers, which will fundamentally change how we all engage with our energy system, which for decades has been taken for granted. We look forward to the challenges and believe that this year we have laid strong foundations to realise a Just Transition to Net Zero.

If you would like to learn more about our wider strategy, you can access a wealth of data and information via the table on the right.

#### **Our publications**



#### **Our Decision-Making Framework**

Our Decision-Making Framework explains the process we follow to decide when and where to rely on flexibility services, providing customers and stakeholders confidence that we are using cost effective interventions to address network constraints, and providing flexibility market participants confidence that we are a neutral market facilitator.



#### Our Network Visibility Strategy

This document outlines why we need to increase network visibility and how we will deliver it in RIIO-ED2. Whilst it covers the whole network, the primary focus is improving LV network visibility as we already have good visibility on the HV and EHV networks.



#### Our Whole System Strategy

Our mission is to unlock the full value of whole system thinking by collaborating not only with other electricity companies, but also key stakeholders including gas and water networks, innovators, network users, non-regulated companies, local areas and communities.



#### Our Just Transition Strategy

As we look towards a Net Zero future, we play a central role, enabling a decarbonised future by facilitating low carbon technologies, making sure our network is safe and resilient, or serving customers across our network, our impact can't be understated. To make sure we deliver these activities in a fair and inclusive way, we're taking steps to embed the principles of a just transition at the heart of our business.



Our Data and Digitalisation strategies, and our Open Data Portal We work with stakeholders to share data which is useful, easy to access, and aligned with their needs. We seek opportunities to improve what we do, recently updating our <u>Data and Digitalisation site</u> to include access to our documents, and making it easy for stakeholders to access our <u>Open Data Portal</u>.

Role	Description
Planning & Network Development	We developed our industry leading network assessment tools transparently compare all network intervention options to prov capacity, and worked with the ESO, local authorities and devol government to understand their needs and ensure that these a reflected in our published Distribution Future Energy scenarios
	We published our first, comprehensive Decision-Making Framework setting out how we decide whether to use flexibilit traditional reinforcement to meet our customers future deman working with our Independent Net Zero Advisory Committee to ensure that our document is clear, transparent, and accessible
Network Operation	We demonstrated a wide variety of uses for flexibility services across our network, through whole system collaboration and close coordination with the ESO, delivering real benefits to customers and communities.
	We delivered network interventions which improve our networ visibility, which will enable us to dispatch distributed energy resources in real time using our industry leading LV support roo
Market Development	We created new markets and new opportunities for flexibility services, and developed a prospectus which provides flexibility service providers with information about our requirements and how to participate in the market.
	We reduced barriers to participation, to support the growth of efficient, coordinated, and competitive flexibility markets, and standardised all contracts, products, and services in line with the ENA Open Networks project.
Data and Information	Through our new Open Data Portal, we shared data and information across all roles of Planning & Network Developme Network Operation and Market Development and created our DSO website to make our data and information easier to find.
	We developed our team and our framework through extensive engagement with our stakeholder, thus enabling us to provide accurate data and information, and a bespoke service to meet and exceed their needs.



# 1. Delivery of DSO benefits

## Realising our ambition

Our overarching purpose is to meet our customers' evolving needs, enable Net Zero, and ensure the continued safe, reliable, and efficient operation of the distribution network and wider energy system.

#### Our ambition

Our transition to DSO will deliver both direct and indirect benefits for our customers, our stakeholders, and our communities. The direct benefits of our DSO strategy come predominantly from the use of flexibility services and constraint management zones, which enable us to manage and optimise the use of the network through alternatives to traditional reinforcement.

This means, that a counterfactual comparison against reinforcement using Ofgem's Cost Benefit analysis template, and considering the whole life comparison, we can avoid the cost of network reinforcement in the short term, and therefore reduce the pass through of these costs to customers' bills.

This year, we have been recruiting to expand the teams at the heart of our DSO transition. We have recruited 35 new DSO roles, and in the next few months our team of strategic optimisers will be expanded to 6 new recruits who will support our local authorities to develop their plans and to improve the uptake of low carbon technology. You can read about these activities on page 9.

#### This year

In our DSO strategy, we set out that during RIIO- ED2 we will invest a substantial £185.1m to deliver activities which realise our stakeholderendorsed DSO strategy and exceed many of Ofgem's expectations. Our RIIO-ED2 approach assessed the cost benefit of alternative interventions against reinforcement in areas of the network where constraints had been identified, and using standard and industry recognised methods of calculation, we identified initiatives which will provide direct benefits of £370m over 45 years.

Delivering 22 constraint management zones will save our customers up to £328.4m over 45 years through optimising the use of our network. You can read about the progress we have made in delivering our CMZ schemes on page 25.

On our wider network, by increasing visibility, our LV monitoring programme will reduce customer interruptions and customer minutes lost on our network, avoid the need for reinforcement, enable the implementation of smarter solutions, and support the reduction of losses. You can read about the progress we have made delivering our LV monitoring programme on page 24.

#### The Benefits of our DSO Strategy

In section 1, we set out the benefits of operating as a "whole system", delivering benefits through coordinating with a wide array of stakeholders including the ESO, gas networks, other utilities and local authorities and devolved governments. Ultimately, improving the efficiency and resilience of the whole system, and unlocking access to the grid by creating new opportunities for coordination and cross-vector thinking.

On page 8, we outline how deferred reinforcement is saving our customers money on their bills, and how the use of flexibility contributes towards the reduction of CO2 emissions and the protection of the environment.

In Section 2, we set out the benefits of improving access to our Data and Information, enabling our stakeholder to make informed, data driven decisions, and supporting the creation of jobs, commercial business opportunities, and realising initiatives which deliver benefits to our society.

In Section 3, we outline how standardising our processes, our contracts and our systems enables the benefits of easier and wider market participation, supporting flexibility service providers to grow their businesses, and generating financial benefits for consumers by interacting with their energy system.

In Section 4, we outline how our industry leading network assessment processes and tools are enabling our stakeholders, including our Local Authorities to optimise their plans, delivering benefits to the local communities by ensuring plans are built based on local needs and ambitions, and that these are supported through to completion.

And finally, in Section 5, we outline how enhancing the visibility of our network is enabling us to manage our distribution network in real time, including how we are using technology and data to address faults before they impact the network – thus reducing the time when our customers are off supply.

In our RIIO-ED2 plan, and throughout this document, you can read about the benefits which our DSO strategy supports.

#### **Our DSO Stakeholder** conference

We have commenced the delivery of our DSO stakeholder engagement plans, building on our industry leading and recognised activities from RIIO-ED1. In February 2023, we hosted our inaugural DSO conference in Glasgow, welcoming almost 100 DSO stakeholders, and creating the opportunities for collaboration and debate through our workshops and our panel sessions.

The day was an opportunity for us to talk to our stakeholders about what DSO means for them, the benefits it will deliver, and we outlined our vision of a day in the life of the DSO. The event received positive feedback direct to our teams, through social media channels and in follow up sessions, and planning for our next event on the 30th April is well underway.







## Our Whole System approach

We believe whole system means going beyond the traditional scope of the electricity network, to harness the opportunities of an integrated, cross-vector energy system, and develop new ways of working and thinking.

#### Our approach

Our strategy embeds whole system thinking across our business, from innovation and investment decision making, to collaboration with industry partners, stakeholders, customers and parties beyond the electricity sector.

Through our role, we coordinate with other DSOs, local authorities, devolved government, and other utilities to increase transparency of network planning. We also support others in their commercial opportunities by publishing network planning and operational data. Knowledge about our network unlocks benefits for others, and our dedicated teams are working to develop their plans.

#### This year

This year, our whole system team have focused on building relationships with the stakeholders at the heart of our DSO plan, working closely with our whole system Strategic Partners, local authorities and local Government to greater whole system understanding and interactions.

In 2023, we established Strategic Partnerships with key organisations in the energy sector. By sharing their knowledge and experience, these Partners help us understand and embed tangible changes in our processes. In the last 12 months we have established Strategic Partnerships with the Energy Demand Research Centre (EDRC), Energy Systems Catapult (ESC), Industrial Decarbonisation Research and Innovation Centre (IDRIC), and Net Zero What Works (NZWW) Group.

We successfully hosted our first annual Whole System Summit in December 2023, and were delighted with the quality of output and level of engagement from all our Strategic Partners. The Whole System Summit is an annual roundtable where we come together and share insights. It's an opportunity to look back over the year and consider ideas for future initiatives. Three take aways from the 2023 summit were intelligence gathering and sharing, digital twins and consumer flexibility.

#### Appointing our Strategic Optimisation team

Our Strategic Optimisation team supports local authorities to develop their energy plans and searches for new strategic relationships to achieve Net Zero. Strategic Optimisers are the interface between local and national authorities and ourselves. Our work includes:

- Supporting the development of strategies, scenarios and programmes; - analysing network projects viability;
- identifying commercial and strategic partnerships;
- recognising whole system opportunities; and
- undertaking financial modelling and cost benefit analysis

Our team was appointed in the last year, and they have already got to work building relationships with local authorities across our SP Distribution and SP Manweb regions. Our team have worked closely with our Scottish, English and Welsh local authorities to support mutual goals of accurate, and informed, long-term planning. This support saves local authorities c£3.5m per annum compared to them having to recruit for and deliver electricity optimisation activities internally.

In our SP Distribution area, we worked with our 22 Scottish local authorities to develop their Local Heat and Energy Efficiency Strategy (LHEES). Within SP Manweb, we worked with our 8 Welsh Local Authorities to develop their Local Area Energy Plans (LAEPs) and we have now commenced the rollout of LAEP process to 10 local authorities in England. We also supported local authorities to identify the optimal location, costs and timescales for 1,400 public EV charging and 800 heat electrification sites. Should the projects for these locations proceed, we will have supported over £15m in economic activity.

We have also developed bespoke data requests for local authorities and industry leading optioneering tools, enabling them to simulate the impact of their plans on our network by using our LHEES tool, which you can read about on page 23.

#### Supporting the Welsh Government's long term planning vision

The Welsh Government is working closely with electricity and gas network operators to make sure their networks can support the energy systems' transformation the Committee on Climate Change says is necessary by 2030. The Welsh Government and energy network operators have all recognised the need to develop a strategic approach to gas and electricity network planning. Wales aims to be the first country to have a joint approach to developing its gas and electricity networks. To do this the Welsh Government is leading the development of a strategic plan for the future energy grid to 2050. This work will gather and assess evidence, consider scenarios, and advise on short-term 'low regret' actions that can be taken immediately.

Members of the Energy Network in Wales Group include:

- Ourselves
- Welsh Government Energy Policy Division
- National Grid Electricity Transmission
- National Grid ESO
- National Grid Electricity Distribution (NGED)
- National Grid Gas Transmission
- Wales & West Utilities

Our team have been working closely to understand the needs of the Welsh government, and the local communities. We have developed bespoke datasets which will support their needs and have provided our teams time and expertise to ensure that their ambition can be realised. We also ensured that the information which we ascertain through these activities is fully embedded within our Network assessment and modelling tools, to ensure that our future forecasts, and our Distribution Future Energy Scenarios (DFES), are fully aligned with the developing thinking of our local communities.



## Coordinating with the ESO at transmission and distribution

As a DSO we support improved resilience of the whole electricity system through coordination with the ESO and use of flexibility services for outage management and operational requirements.

#### Our approach

In our DSO strategy we set out the value from coordination with the ESO, gas networks, other utilities and local authorities and devolved governments which can be achieved through improving the efficiency and resilience of the whole system. The growth in use of flexibility is a key element of being a DSO. The savings come from avoidance of gas generation, reduced reliance on carbon producing technologies, and reduced network reinforcement.

The ESO is increasingly dependent on services from distribution-connected providers (known as Distributed Energy Resources) as their need for services increases and their traditional transmission-connected providers close. They need these services to help keep the GB system in balance. They also need these services to restart the system in the event of a widescale black start.

#### This year

We have continued to build on our track record of close collaboration with the ESO through supporting them in their Local Constraint Market (LCM) trail, working with them on our Distributed Restart project, and by ensuring that they are actively engaged in our day-to-day activities.

Our inaugural DSO conference panel included representation from Julian Leslie, Director of Strategic Energy Planning and Chief Engineer at National Grid ESO, ensuring that the vision and ambitions of the ESO are represented and coordinated with our own ambitions.

And finally, on page 25, you can read about how we are developing the capability to coordinate with the ESO to dispatch Distributed Energy Resources, ensuring that the ESO and DSO systems are both optimised, and that conflicting actions are not taken.

To maximise market opportunities, it is essential that we coordinate and facilitate market access to both transmission and distribution markets, by developing relationships and alignment across ESO and DSO markets. This year we worked closely with the ESO to develop the Local Constraint Market (LCM).

In early 2023, the ESO launched its trial of the LCM, seeking to resolve network constraints at the Anglo-Scottish boundary, the transmission network boundary with highest constraints across GB. In partnership with Piclo, ourselves, and Scottish and Southern Energy Networks (SSEN) the trial is exploring how domestic demand can be turned up at times of peak generation export to help to alleviate the constraints.

This trial closely mirrored our own trial in the south of Scotland with Octopus Energy also seeking to co-ordinate demand turnup at times of peak generation export. One of the key findings from our own trial was understanding the limitations of demand turn up before it starts to impact on the distribution network. We arrived at this outcome through the use of our Engineering Net Zero (ENZ) platform, applying a range of participation scenarios. We expect demand turn-up to play an increasing role in balancing the network, driven by an increasing penetration of connected low carbon technology and customers being able to take a more active role in flexibility service provision.

It is essential that we avoid unintended consequences which could leading to localised overloading of the distribution network and loss of supply to customers. This is why we are working closely with the ESO, Piclo and SSEN to unlock the potential for demand turn up whist ensuring that there are no adverse effects which could reduce the quality of service to our customers.

#### Coordinating with the ESO to manage the transmission / distribution boundary

#### Working with the ESO to improve the resilience of the network

In 2023, we concluded our 3 year Distributed ReStart project, in collaboration with National Grid ESO and TNEI. These worldfirst trials demonstrated in practice the use of Distributed Energy Resources (DER), like hydro plants, wind turbines and solar PV, to restore power faster to the transmission and distribution networks in the unlikely event of a black start event.

Through innovation funding, the project developed the technology to make it possible to restore power faster in the unlikely event of a black start by producing specifications for power networks, control systems and resilient telecoms systems.

Distributed ReStart went further than expected, and through the project we designed, built, and tested an automatic control system to make fast and complex balancing decisions at distribution level, while dealing with potentially hundreds of distributed energy resources. We are now transitioning everything we've demonstrated into business as usual, implementing and realising this innovation into a viable commercial service, and working with hundreds of partners across the industry to meet the Electricity System Restoration Standard by the end of 2026.





## Realising benefits from flexibility

Flexibility is key to optimising our network, enabling us to accommodate the forecast level of growth due to low carbon technology adoption and electrification of heat and transport. Use of flexibility realises real benefits such as improved resilience in our network, optimised use of our assets, and reduced customer bills.

#### Our Approach

Flexibility services are where our distribution connected customers agree to change their demand/generation in return for payment. Customers that provide us with these services are called Flexibility Service Providers (FSPs).

By using flexibility services to support the operation of our network, and to accommodate forecast growth and manage constraints, we can defer network reinforcement activity, which is costly and time consuming, and we can operate our network in new ways to ensure we are fully optimising our assets.

In our RIIO-ED2 plan, we forecast that we would use flexibility services across 1,352 sites identified for reinforcement on our network, and by doing so we would save our customers between £36m and £145m depending on the Distribution Future Energy Scenario that transpires.

By using flexibility services for high utilisation groups, we will realise £9.15m in savings for our customers over 45 years by deferring planned reinforcement in these areas.

#### This year

To date, we have contracted for 579MW of flexibility services against a RIIO-ED2 requirement of 1.4GW. This year, we completed two tenders, seeking 571MW across 575 sites and covering all voltages on our networks. The outcome of these tenders is that we have contracted with 5 flexibility service providers to deliver an additional 29MW of flexibility services.

Our annual tenders are important as they stimulate the market, and provide us with information on the level of service which the market can provide, enabling us to increase the levels of flexibility services we use, and deliver increased benefits to consumers. However, we need to increase market participation to enable us to realise the benefits forecast in our RIIO-ED2 plans. In the last year we have focussed on engaging with current and potential flexibility service providers to standardise our processes and contracts, increase the visibility of our requirements, understand the barriers to participation, and to improve our commercial offerings. You can read more about our activities in Chapter 3.

#### Deferred reinforcement through use of flexibility

Through the success of our tender activities to date, we have contracted sufficient flexibility services to defer reinforcement where we had identified the need for 6 primary reinforcement schemes on our network.

A primary reinforcement scheme is where the capacity required at a specific location on our 33kV network is forecast to exceed the existing network capacity. This would typically require the construction of a new primary substation, and include the need for c12 months of planning, design, purchasing, and construction.

In total, these 6 schemes, would have cost us over £18m and would have taken our teams 12-24 months to deliver. By securing flexibility contracts in these locations, we are able to take the decision – through our Decision-Making Framework – to defer the need for these works. In this year, £4.7m of the £18m expenditure has been deferred, which equates to a 45-year NPV benefit of £590k. We completed all of this using our new industry leading Piclo platform which you can read about on page 17.

We have contracted for flexibility on a further 17 primary reinforcement schemes planned for future years in order to manage uncertainties in forecast load growth, or to reduce the number of hours the network is at risk of constraint while we continue to deliver our planned reinforcement schemes.



## Creating new market opportunities for flexibility providers

This year, we launched our operational flexibility market, seeking the flexibility services to provide additional network security to customers during planned outages. These outages can last for a few days, depending on the scope of works. During these periods, customer supplies are more at risk of interruption as the network is naturally less resilient as we have had to take part of it offline to do work.

This means that if a fault were to occur during these outage periods, customers would be more likely to lose supply than at other periods. We use flexibility services to provide extra supply security for customers. This means that if a fault were to occur, the flexibility services would be used.

Working with our Control Room we are reviewing a rolling 12month window of planned outages and where it is cost effective to do so we will seek to procure flexibility services. With this new market offering we have undertaken bi-lateral discussions with FSPs that are able to provide the required response, ultimately contracting for 54MW and paying out £35k to FSPs.

If this market were expanded across all DSOs this could result in upwards of £3m of market opportunities within the RIIO-ED2 period and improved resilience for UK customers during planned outages.

## Seeking and Realising new opportunities

DSO does not operate in isolation. It requires extensive investment in the distribution network, and in the everevolving energy landscape, new challenges and customer requirements are continually emerging.

Network investment to enable Net Zero In our RIIO-ED2 business plan we set out an ambitious £3.2bn of investment to:

- Develop a network that's ready for Net Zero
- Be the trusted partner for customers. communities and stakeholders
- Ready our business for a digital and sustainable future

Investing in our network and ensuring that we can accommodate the forecast level of customer growth, is enabled by our DSO strategy. But it also relies on us delivering significant investment on our network in the next five years – most notably our LV network. Upgrades are vital to enable customers to connect their Low Carbon Technology (LCT), to fully optimise their energy usage, and to ensure that decarbonisation targets are met. We forecast that based on our Distribution Future Energy Scenarios we will invest £189m in RIIO-ED2 on our LV network to accommodate load growth.

#### Improving access to the grid

The volume of connected and contracted electricity storage on the GB distribution network has grown significantly in the last few years. By June 2023, it had grown to 53GW, with most of this signed in the previous 12 months. To provide context, this is close to the total GB electricity peak demand (~60GW) and over seven times the highest forecast demand for 2030. These volumes provide a significant opportunity for a decarbonised system but also present challenges. In many areas, there is little spare network capacity which means that this volume of larger-scale electricity storage is adversely impacting customers. This challenge was recognised by industry and Ofgem, and this year we chaired the industry Connections Reform working group.

In addition, we have initiated work to ensure that electricity storage data that DNOs report to the ESO under the "week 24" process is consistent. This is important as the ESO and TOs use this data to plan the transmission network – reducing variation and uncertainty in data will result in more efficient whole system planning.

Service cables (services) are the network assets which connect individual households to the LV network. Over 500,000 of our customers are supplied by "looped" services, where multiple properties share a single service cable. These are insufficient to accommodate the electrification of domestic heat and transport. One of our major RIIO-ED2 programmes is to replace these.

This year, through our DSO activities, our network assessment process identified that more looped services would need replaced than had been included in our RIIO-ED2 Business Plan. This is because recent forecasts for the uptake of EVs and heat pumps have increased. We were able to identify this using our network assessment tools which you can read about in Section 4.

In the last 12 months we have installed c. 7500 services, through both our proactive and reactive unlooping programmes, a step change in prior year volumes. We have moved from a reactive to proactive programme, ensuring the capacity is there when customers need it. These upgrades enable potential carbon benefits of up to 30,000 tonnes of CO2 per year, equivalent to 20,000 return flights from London to New York.

At the start of RIIO-ED2, we were concerned about delivery challenges due to the scale of the programme, supply chain issues and lack of skilled resources. This year, we overcame these challenges and developed a framework to enable us to deliver 28,000 planned volumes in RIIO-ED2. We built a new project management department, onboarded 8 new Service Partners, provided training to >40 jointers, and onboarded 20 apprentices on the programme. We also delivered open days to school leavers and worked with local councils to encourage new joiners into our industry, creating benefits to wider society by improving employment opportunities across our communities.

#### Enabling Net Zero by upgrading the LV network

#### **Connections reform working group**

We take an active role in identifying and developing solutions to challenges which are identified across all activities in our industry. In resolving the challenge of the connections queue, we led much of its work to review the connection arrangements for electricity storage customers, and in just three months developed three tactical solutions which were ultimately approved by Ofgem. As a result of this work, new common network access rights for distribution electricity storage were introduced in September 2023, as well as common guidance on how these customers should be treated during the assessment process to design their connection.

As a result of this, in the period September 2023 to February 2024, over 18.8GW of electricity storage has been offered out across GB using these new network access rights. The result is that the GB network investment required to accommodate electricity storage installations is reduced, and it enables better use of existing network capacity. This means customers – including electricity storage customers – should on average be able to connect more quickly, and customer-funded network investment is reduced.

Whole system benefits which have also been realised include common treatment of electricity storage customers across different DNOs, and greater understanding and predictability of the scenarios in which they will be constrained.

Whilst this work was not foreseeable when we were developing our DSO Strategy – it is an additional activity which we have led and delivered, which has delivered benefits across GB, and demonstrates that whole system - and industry coordination can deliver real results and in short time periods.



# 2. Data and information provision

## Realising our ambition

We are committed to becoming a data-centric organisation, harnessing the power of data to drive strategic decision making, foster innovation, and embrace sustainability.

#### **Our Strategy**

We have developed and published our Data Strategy which outlines how we will enhance data and analytics capabilities over the RIIO-ED2 period. To be successful in our DSO transition, we must use data in our decision making, and make data available to support and enable our customers and stakeholders to make informed. data driven decisions.

We are committed to sharing data with our customers and stakeholders on a "presumed open" basis. We recognise that access to data, and information, will be an enabler in Net Zero, and that we have an important role in facilitating efficient whole system planning and operation, supporting the development of new markets.

Our stakeholders have told us that they require access to data and information about our network to develop accurate plans, enhance project proposals, and to understand their impact on our network. Our aim is to provide a comprehensive suite of secure, trusted and shared data and information across all activities of the DSO.

We actively promote access to our data and our information, through our DSO conferences, where our Open Data team were on hand to demonstrate our datasets, and where our teams brought to life how we use our data in our day-to-day activities.

#### Building our team

This year, we have recruited multi-disciplined teams across Data Governance, Open Data and Applied Analytics, creating the capabilities to govern, master and glean value from our data. Since the appointment of our Data Governance and Open Data team in August 2022, we have responded to over 300 requests and have published over 50 datasets on our Open Data Portal.

Our team take an active role in promoting the needs of our stakeholders to ensure that the guidelines set across the industry are aligned to what our stakeholders are telling us. This includes responding to industry consultation to ensure the developments in the regulatory framework represent the views of stakeholders.

This year, we responded to Ofgem's consultation on the Long Term Development Statement, and contributed to Ofgem's consultation on sharing of smart meter data, where we outlined our views for standardisation of sharing and consent processes across all user groups. In our response, we outlined our views on the implications of enabling flexibility aggregators access to smart meter data which the DSO is not also afforded, which would mean we would be unable to utilise this data to improve our forecasting.

The main forum within the industry for data is the ENA's Data and Digital Steering Group (DDSG). We chaired this forum in 2016 at its inception and have now resumed the role of chair from January 2024. This enables us to take an active and leading role in delivering real change, ensuring that the pace and direction of change is standardised. This group provides opportunity for industry to work together towards full compliance with Ofgem's Data Best Practice Guidance.

The energy landscape for data sharing is under review, with increased scrutiny on data security by the Department for Energy Security and Net Zero (DESNZ) and the National Protective Security Authority (NPSA). Our team have worked with Ofgem and DESNZ on improving data security standards for energy data sharing, our view is that clearer guidance is needed to ensure industry alignment.

#### Leading change in the industry

We recognise that provision of our data and information must be aligned with industry standards. The industry must work together to develop clear principles, policies and tools which are standardised.

#### In the 2023/24 regulatory year we have...



Facilitated the provision of comprehensive data and information across all 3 roles of the DSO; from Planning and Network Development where we share over 30 datasets, Network Operations where we share 9 datasets and Market Development where we share 3 datasets.



To improve data quality and identify and address gaps in data we have selected and begun the phased deployment of "Informatica" – our Data Governance tool. The implementation is being undertaken in line with the development of our prioritised list of data policies - ensuring a robust framework for how we manage data in our organisation.



We have developed a comprehensive Data Triage framework, which aligns with the guidance in Ofgem's Data Best Practice, ENA's Data Triage Playbook and the NPSA's Triage Process Guidance. In response to industry direction from DESNZ, we recently reassessed all our datasets published openly – concluding no change and satisfying ourselves that our Data Triage is secure by design.



Through ongoing stakeholder engagement, and trend analysis of stakeholder use, we prioritised and published an additional 30+ datasets under an Open Licence, and 8 datasets under a Shared Licence – providing in excess of 50 datasets on our Open Data Portal



We have enhanced the design and navigation of our SP Energy Networks website and Open Data Portal to promote accessibility. Through our Open Data Portal, our data is available in an accessible, common format and readily available in a logical, easy to access location, and data best practice standards for metadata and the use of standardised APIs for all of our data products are consistently applied.



We are delivering eight live data focused projects – carefully designed to meet stakeholder needs – each initiated and approved through our "Data and Digital Systems Review Group" for timely delivery.



## Improving the scope and granularity of our data

We share a comprehensive suite of data across Planning and Network Development, Network Operation, and Market Development which we ensure remains up to date and relevant for customers' needs.

#### **Meeting Baseline Expectations**

Ofgem's DSO baseline expectations set out the data which we are required to deliver to ensure that the industry are sharing a standardised suite of data to support the DSO transition.

Whilst we meet our licence conditions, and Ofgem's guidance, we also take a stakeholder led approach to developing our plans. We have created monthly internal reporting which helps us to understand our stakeholders' needs by looking at trend analysis and categorisation of requests received, which enables us to interrogate data about our requests and to improve our services.

Whilst we already make a suite of data and information available on our website, and on our Open Data Portal, principles of data sharing in the energy sector are in their infancy in many ways, and we are continually seeking opportunities to work with other industries, and with stakeholders, to improve our tools, our services and our capabilities. We embrace continuous review and improvement of the data we publish to better meet our stakeholder needs through proactive engagement, industry leading roles, and a personal and tailored approach.

#### Going above and beyond

We make new and improved datasets available in response to trends identified through our reporting. In May 2023 we published underlying datasets to our Distributed Generation Heat Maps. Our heat maps have been available on our website for over 5 years and proven a successful resource for stakeholders, however, an increased number of requests were seeking access to the datasets that underpin these maps. Since uploading, there has been more than 3,400 downloads and a positive reaction from stakeholders.

We have worked with stakeholders to refine existing datasets. In April 2023, we uploaded our GIS Shapefiles onto our Open Data Portal under a shared data licence, in direct response to high stakeholder demand. Access to these files has been well received by stakeholders. In October 2023, following stakeholder engagement, we updated our GIS shapefiles to include additional data points, including enhanced pole and stay information, and non-powered cables and lines.

It is important to recognise that our teams have expertise in how to understand and use our data for the purposes of planning, project development, and in identifying opportunities. We make our technical teams available to our stakeholders to support them and to ensure that the data and information we provide is fit for purpose. We have held over 20 bilateral meetings with stakeholders in the last 12 months and received complimentary feedback on our engagements.

#### Role Plani Deve



Netw Oper







	Dataset	Description
ing & Network lopment	Distribution Future Energy Scenarios (DFES)	Provides users with geographically granular forecasts out to 2050, covering changes to our distribution networks out to 2050 as a result of GB's transition to Net Zero.
	Network Development Plan (NDP)	Explains how we plan to deliver the capacity our customers need to decarbonise and sets out where our network has capacity headroom to accommodate demand and generation growth.
	Long Term Development Statement (LTDS)	Provides users with details of electrical and location data for assets and their network configuration, and an understanding of network limitations, capacities and an indication of planned works.
ork ations	Embedded Capacity Register	Provides users with an industry standardised view on connected generation and storage resources as well as network services.
	Generation Heat Maps	Provides users with an overview of headroom available for connecting to our networks, allowing less technical users access to data to inform decisions on where to make connection applications.
et .opment	Curtailment	Provides indicative curtailment levels based on generator type, GSP, and region. Users can use the curtailment data to see which site becomes a point causing curtailment.
V	Load Related Interventions	Provides a full suite of information on the planned interventions on our network across the five-year price control period, including the evaluation of flexibility.
	Flexibility Strategy & procurement	Provides information on our procurement activities, our tender results and on ongoing approach to developing the markets for flexibility service providers.

#### **Future Plans**

The provision of energy data and information to stakeholders is relatively new and very much developing. Whilst we have created a framework to ensure that we are able to deliver and measure our success, this framework will evolve as stakeholders needs mature, and as the understanding of data security evolves.

In our Decision-Making Framework, we set out how we use data, and data driven tools, to underpin our network modelling and forecasting, and we publish our underlying datasets and our decisions. We have challenged ourselves on how we can make better use of our own and our third- party data, and examples of this which are still developing include the use of smart meter, power quality and Internet of Things for LV fault monitoring.

We are making progress in establishing the full suite of materials required through our license conditions and based on the trends and feedback from our customers, and we have extensive plans for future publications as our data catalogue grows, including plans to publish our LV monitoring data once we have rolled out our monitoring programme.

We have plans to develop visualisations for our openly published datasets throughout 2024 and to share our underlying methodologies on our newly developed website. We are developing the most appropriate level of detail and planning to test this with stakeholders prior to go live during the 2024/25 regulatory year.

## Ensuring our data is accurate

We set out in our RIIO-ED2 business plan, our objective to become a "data driven" organisation - meaning that we are an organisation that relies on trusted, accurate data to drive business operations, decision making and value.

#### Improving our data quality at source

This year, our focus has been establishing the foundations of Data Governance, developing the capabilities to govern our data in a manner which ensures mastery of high-quality data at source, and provides the tools to enable us to take action to improve our data. Data Governance is the foundation of any data driven organisation, enabling us to proactively manage, locate and use data with confidence. In December 2023, we appointed a Data Governance Manager, who has the responsibility for establishing a Data Governance framework. We established a monthly Data Governance forum in February 2023, chaired by our Head of Network Intelligence, attended by senior representatives from all areas of our business with responsibility for driving our culture change to "treat data as an asset".

This year we have been deploying our Data Governance software, Informatica. A core component of the Informatica software is the data catalogue, which creates a companywide and accessible repository of data, making it easier for users to find and make sense of our data. Additionally, Informatica introduces a data quality solution functionality to scan our data assets and measure them against pre-defined data quality rules. This facilitates identification of required improvement actions which will then be tracked to completion, helping to ensure our data is fit for purpose. We have successfully completed our Proof of Concept (PoC) of Informatica, and now look forward to progressing with the next stage.

The Informatica Proof of Concept used a We have implemented a robust Data Triage subset of our asset data to demonstrate data framework, allowing us to ensure a consistent governance, supported by digital tools and and methodical approach to how we share data. Data triage essentially means the process we providing a standardised approach to data management including: follow to decide whether data can be shared. Our Data Triage framework which is fully aligned with 1. One company-wide catalogue, a go-Ofgem's Data Best Practice and the ENA's Data to place for searching, finding and Triage Playbook. Following industry engagement understanding our data, including with DESNZ on their data security concerns, we metadata, lineage and business glossary. have tested our triage framework against the National Protective Security Authority's (NPSA) 2. Improved understanding of the quality Triage Process Guidelines and consider ourselves of our data to ensure it is fit for purpose to be aligned. The NPSA promote the concept of a and that only the most accurate datasets "security minded approach" and in February 2024 are driving our initiatives. we updated our Open Data Portal to include a 3. Automation and digitisation of Data mandatory login for requestors to access our data.

- data when they need it.
- policies and standards.

In the 2024/25 regulatory year we are developing a suite of Data Governance policies, describing how we will govern our data and setting the standards for compliance. Our initial prioritised areas for our policy developments are; data roles and responsibilities, metadata standards, data quality and data security and privacy.

#### Ensuring published data is accurate and secure

Governance processes and activities to provide users with access to the right

4. Embedding a model for ownership and responsibility for data related activities ensuring data assets comply with our

In response to a request, and prior to the publication of any data on our Open Data Portal, we first identify the dataset, and the owner. We then complete a risk assessment in conjunction with the Data Owner, our Cyber Security colleagues and our Data Protection manager. This documented risk assessment allows us to determine any potential sensitivities which could be exposed if we publish the data "openly" and facilitates identification of any mitigating factors. We evaluate the appropriate sharing classification of our datasets, determining the classification as follows:

- Open can be published on our Portal
- Shared can be published in a password protected area of the Portal under a shared data licence
- Closed can be shared using a bespoke data sharing agreement or non-disclosure agreement

There may be occasions when we are unable to share data on the basis that the data cannot be anonymised or redacted to manage sensitivities such as commercial, GDPR and Cyber. Where this is the case, we update our stakeholders on the outcome of the risk assessment and, where possible, work with them to identify alternative datasets that could be made available.

Our risk assessment also facilitates a review of the data quality. Where quality issues are identified, these are logged and tracked to resolution. An assessment is also made, whether benefit can still be attained by publishing the data in its' current form – recognising that data quality should not be considered a barrier to sharing.

The output of our risk assessments, and the classifications, are presented to our monthly Data Governance Forum. This forum has decision making accountability for the publication of our data. All risk assessments are reviewed 6 monthly, ensuring that the controls we have in place remain valid as industry guidance evolves. We have plans to continue to develop our data triage and our risk assessment processes in conjunction with the wider industry, and as guidance develops.







## Improving accessibility for stakeholders

#### Improving ease of access

We make it easy for our stakeholders to access our data, with all our published, and shared, datasets hosted on our Open Data Portal. The portal is accessible via our SP Energy Networks website, and we have recently completed an overhaul of our Digital, DSO and Data website to improve the user experience, and to promote visibility.

Datasets that were previously hosted on various pages across our SP Energy Networks website have been centralised on our portal, meaning our stakeholders do not need to visit more than one location when looking for access to our data. Our portal also hosts the datasets that underpin our strategic documentation, including the data which supports our Distribution Future Energy Scenarios, our Long Term Development Statement and our Network Development Plan.

In our portal, users can search keywords and themes, and can search our detailed metadata, as well as independently download, export and consume data via an API. We also have detailed descriptions and definitions to support stakeholders to understand the content. We are working to develop visualisation capabilities of the portal, enhancing the provision of information for users.

This provides stakeholders with a clear and simple path to access our data and provides supporting information on the three roles of Planning and Network Development, Network Operation and Market Development.

#### **Standardising formats**

This year we have updated our Open Data Portal so that our catalogue is built using industry standard metadata, as set out in Ofgem's Data Best Practice. We recognise that not all stakeholders have the same requirements when accessing data and that is why we make our datasets available in several formats including CSV, Excel and JSON, with the ability to download all via an API.

The highest proportion of requests we receive is for our asset data, in the form of shapefiles which provide locational data on our assets. This is data we have risk assessed and do not share "openly" due to security risks. To enable controlled access, we have implemented a "shared data access" solution on our Open Data Portal; a section of our Open Data Portal which provides selective access to stakeholders who have been vetted and have accepted the terms of our "shared" licence. This is a material improvement on previous process where these large datasets were shared via email and enables our stakeholders to easily download up-to-date versions in a standardised format and perform their analysis from our secure environment.

Where a more bespoke need is identified, we work with our stakeholders to provide data in their preferred format, for example converting our GIS Shapefiles into Excel to meet the needs of an individual request in January 2024. We are also working with the industry through the Data Triage and Data Licencing working groups to share our developments, and to ensure that we can implement best practice from the industry.

#### Aligning with industry standards

It is important that the industry evolves at pace and that all remain aligned to ensure all customers and stakeholders benefit from improved availability of data and information in a standardised format.

One of the main enablers of industry standardisation is through compliance with Ofgem's Data Best Practice Guidance: 11 principles that set out how organisations should manage their data. SPEN are fully committed to compliance with Ofgem's guidance. We have placed compliance at the heart of our data strategy, and have built our teams and framework to ensure clear accountability for each of the principles. As part of our internal reporting, we measure and monitor compliance with all principles and have commenced development of an internal communication plan to promote understanding throughout the organisation; delivering this communication plan will be a focus of the 2024/25 regulatory year.

We are building the foundations which will create ease of access to data for stakeholders and are deploying repeatable patterns which support data re-use and enable agile development. We recognise that increasing volumes of data will need to be shared across the industry, and we are keen to support Ofgem's "data sharing infrastructure" initiative, which seeks to deploy a standardised highway for data flows across the energy industry.



Our Open Data Portal provides a single, easyto-access interface for our users, enabling them to easily explore, filter, view, download and consume our available data. Via our portal, stakeholders can:

- Download data in multiple formats
- Consume data via an API
- Feedback on datasets
- Request datasets / access
- Subscribe for updates

 $(\Rightarrow)$  More information about our Open Data Portal is available <u>here.</u>







## Working with stakeholders

We make it easy for our stakeholders to contact us. In June 2023, we appointed our new Open Data Manager, who leads engagement with stakeholders on sharing our data and information. Stakeholders can contact us via our "feedback form" on our Open Data Portal or directly via our Open Data email address.

*"I just wanted to provide extremely positive feedback on the support that I've recently received from the team... has gone above and beyond to listen to requirements about the new dataset that I requested and has kept me up to date on progress frequently. Great work, and wanted to acknowledge that."* 

#### Our personal and tailored approach

We work directly with stakeholders to ensure that we understand and meet their needs, and to identify opportunities for improvement. We recognise that the provision of energy data and information is a new and emerging field, and that stakeholders in many cases are unclear as to what data or information they need in order to be able to develop their plans, or to support their ambitions.

As a recent example, we partnered with local authorities to support the development of Local Heat and Energy Efficiency Strategies and Local Area Energy Plans. However, the blueprint of requirements for this had not been developed, and in 2023, a third party on behalf of Welsh Government requested data to support their Local Area Energy Plans. Our team worked with them to establish their requirements and to compile the data they required, in the format they required, and to develop an approach which was repeatable, and could be rolled out to all other local authorities in our licence areas. These datasets are now available on our Open Data Portal under a shared data licence and access can be requested by all local authorities.

We were also recently approached by the UK Department for Science, Innovation and Technology, seeking support for their Manchester Prize, an initiative which will award £1 million every year to a team of innovators with the most cutting-edge AI solution for public good. We worked with them to provide access to our data and to create materials to support applicants, also proposing ways which our data could be used for the benefit of society, and have offered to provide our resources and our expertise to support successful candidates.

#### Our proactive engagement

We recognise that stakeholder engagement is a twoway process, and in addition to responding to requests for access to our data, we reach out to stakeholders to understand what datasets could support their areas of interest. In February 2024, we circulated an "Open Data" survey to 140 stakeholders to gain feedback. The responses have been captured and have informed our future publications and developments.

We asked stakeholders if their experience engaging with our team and accessing our data met their needs, and how our approach could be improved. Some direct actions from our survey included;

- Directly engaging with responders to understand more about their feedback and support them in overcoming technical issues which their response had highlighted.
- Enhancing our Open Data Portal in areas which received feedback, including streamlining navigation, grouping datasets, and simplifying "contact us" routes.
- Improving the format of feedback forms, in direct response to stakeholder input on improving ease of use and access.
- Connecting stakeholders seeking enhanced information to support their needs with internal experts.

Proactive engagement will continue, and we are looking for new methods to engage stakeholders ensuring that we are mindful of stakeholder fatigue in our activities.

#### Our leading and active role in the industry

We take an active role across the industry, supporting the development across all roles and activities of the DSO. Data and information activities are represented across many forums, with many facets of DSO activities relying on data in some manner, however the main forum within the industry for the development of data and information is the ENA's Data and Digital Steering Group (DDSG).

We originally chaired this forum in 2016 at the time of its inception and have resumed the role of chair from January 2024. This enables us to take an active and leading role in delivering material change across the industry, ensuring that the pace and direction of change is standardised.

We have also been supporting two industry wide, ENA led initiatives which seek to standardise the data and information which is collated and made available across all distribution network operators. This includes the National Energy Outage Platform (NEOP) project, which predominantly seeks to standardise outage data which is shared during significant storm events, enabling better use of resources to restore power, and ConnectDirect, which aims to improve the capture and accessibility of data on low carbon technology connecting into all distribution networks.





# 3. Flexibility market development

## Realising our ambition

We support the growth of efficient, coordinated, and competitive markets for flexibility services. This is important to our customers who wish to participate, to us for accommodating decarbonisation, and to the ESO for maintaining system stability.

#### Our strategy

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Flexibility services are where our distributionconnected customers agree to change their demand/generation in return for payment. Customers that provide us with these services are called Flexibility Service Providers (FSPs). These services have value to us as they help us keep distribution network power flows within network limits, so avoiding capacity constraints. They play a key role in helping us accommodate Net Zero growth as they can be deployed more quickly than reinforcement and can help manage uncertainty.

Our Market Development function establishes the processes which enable us to contract with FSPs. We are increasingly looking for new ways to stimulate the flexibility market, including changing how we structure contracts, developing new market opportunities with our customers and stakeholders, and understanding what data flexibility providers require from us to help them make informed decisions about future market participation. Flexibility services provided by distribution-connected FSPs will also be valuable to the Electricity System Operator (ESO) to help keep system frequency within limits and for other system services.

#### This year

Since 2021, we have tendered annually for flexibility services to fill gaps identified at specific locations through our annual network assessment processes. Our use of flexibility services for planned outages has also grown, and whilst to-date this has been done bilaterally with larger customers, we will now be including this requirement in our shorter-term tenders. The year-on-year increase in requirements are significant both in the number of locations and volume of capacity.

To date, we have contracted for 579MW of flexibility services against a RIIO-ED2 requirement of 1.4GW. This year, we completed two tenders, seeking 571MW across 575 sites and covering all voltages on our networks. The outcome of these tenders is that we have contracted with 5 flexibility service providers to deliver an additional 29MW of flexibility services.

Historically, our annual tenders are important as they stimulate the market, and provide us with updated information on the level of service which the market can provide, enabling us to increase the levels of flexibility services we use, and deliver increased benefits to consumers. We have now moved to mothly tenders, in order to further stimulate the market and support the needs of flexibility services providers.





#### In the 2023/24 regulatory year we have...



Standardised our flexibility products, qualification criteria and contracts aligning with industry standard practise through our leadership in the Open Networks working groups.



Carried out extensive stakeholder engagement concluding our commissioned Oxera report, which surveyed providers seeking to understand the barriers to participation in our flexibility tenders and adapted our approach in response to findings.



Tendered for 571MW of response across 575 sites covering all voltages on our networks, unlocking the value of flex and contracting with 5 FSPs to deliver an additional 29MW of flex not bound by exclusivity clauses.



Partnered with Piclo to develop and provide one single end to end flexibility platform that is free to use for FSPs, making it easier for them to engage in our flexibility tenders.



[] (4) Set an industry leading benchmark by launching our operational flexibility market, using flexibility services to provide network security during planned outages – improving security of supply for our customers, and creating market opportunities for providers.

Coordinated with the ESO to support the development of ESO markets that are seeking participation from providers connected to the distribution network, and thus enabling distribution customers to support the management of transmission constraints.



Concluded our Distributed ReStart project, in conjunction with the ESO and TNEI, where world-first trials demonstrated the practical use of DER to restore power to the transmission and distribution networks in the unlikely event of a black start, evidencing our ambition to use flexibility for whole system optimisation.



## Developing products and contracts for flexibility services

Our products, contracts, and qualification criteria are standardised, and we have taken significant steps this year to adopt industry standard practice, implementing the full suite of Open Network Project deliverables.

## Standardisation of products

The ENA Open Networks project has driven standardisation, focusing on products, contractual frameworks and evaluation methodologies. Of these initiatives, we co-led the Open Networks working groups developing standardisation for products and contracts. Ofgem have sought standardisation of flexibility markets through their work and industry engagement on both a Flexibility Market Facilitator, the entity that will govern flexibility markets and on Flexibility Digital Infrastructure, the IT architecture that will underpin standardisation.

We now procure flexibility products aligned with those developed by the ENA Open Networks Project namely:

Product name	Paymei
Scheduled Utilisation	Utilisati
Operational Utilisation	Utilisati
Operational Utilisation + Scheduled Availability	Availab
Operational Utilisation + Variable Availability	Availab

We have implemented in full the current set of Open Network Project deliverables. This includes the adoption of the new flexibility product definitions bringing standardisation of the operating parameters for flexibility services, this will make it easier for FSPs to participate in flexibility markets seamlessly across all DSOs and standardises the parameters for flexibility products.

More information on the new aligned products developed by the ENA Working Group is available on the <u>ON Flexibility Products Review and</u> Alignment page on the ENA website.

*"We have taken significant"* steps this year to adopt industry standard practice."

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#### Standardising our contracts

To date, we have issued bilateral Flexibility Services Agreements "the contract" reflecting the accepted bids following each tender round. Flexibility services bids only have any contractual effect when they are covered and contained in a Flexibility Services Agreement.

In our agreements, we do not include any market exclusivity clauses within the standard terms and conditions for flexibility services. As part of the tender process, we assess the technical capability of participants to provide services, but we will not exclude them based on interactions with other flexibility markets.

The terms and conditions contained in our overarching agreement are as per those developed by the ENA Open Networks project, which can be found here.

We are also actively involved in and fully supportive of the primacy work being carried out under the ENA Open Networks project and believe that appropriate and proportionate primacy rules between ESO and DSOs is paramount in unlocking future flexibility markets. The ENA Open Networks project is also developing a framework agreement, moving towards alignment with the ESO process for procuring services. It is our intention to implement the ENA standard framework contract as a default as soon as it is available, with the to be process as follows:

- 1. Flexibility Services Agreement terms and conditions plus accompanying schedules are issued as part of the ITT documentation.
- 2. Flexibility service providers review, complete and return the Signature Page to us to countersign.
- 3. Flexibility service providers can then participate in the individual tender competitions and submit bids.
- 4. Once a bid is accepted, we issue a Contract Award Notification detailing the individual services. This Contract Award Notification will form part of the Flexibility Services Agreement.

This year, we have developed framework contracts for flexibility service providers that we will implement alongside our move to monthly flexibility tenders, these framework contracts will provide standardised terms and conditions across all DSOs. This will result in reduced requirements for bi-lateral negotiations, streamlining the procurement process and reducing the administrative burden on flexibility service providers. Further details on our procurement process can be found on our <u>Flexibility website</u> and on Piclo's website.



## **Developing processes** and tools for flexibility services

In an industry first, we have developed and implemented an end-to-end flexibility service platform called Piclo Flex in partnership with Piclo, a software developer, and aligned with our stakeholders needs.

## Procuring platform

Our Piclo Flex platform manages flexibility services from procurement and tender through to dispatch and settlement and creates a more seamless and simpler process for FSPs. It enables the use of standard flexibility service products across all voltage levels. The Piclo Flex platform is free to use and uses APIs so that no expensive or specialist communication equipment is needed. Implementing this platform is a big step forward to utilising flexibility services across our whole network. This is now live.

We also employ Piclo to carry out the tender stage of our flexibility procurement process. Registration and utilisation of Piclo is free for FSPs, we believe this free access is essential to encourage participation and exploration of flexibility tenders by FSPs. Piclo Flex is an independent marketplace for trading energy flexibility. It has more than 300 FSPs registered on its platform and is recognised within the industry.

Our relationship with Piclo has provided a consistent and simple process for FSPs to access our tenders. The platform hosts all our tender requirements, along with key Tender documentation, enabling FSPs to access information and user-support quickly and easily. Picloflex.com.

Piclo Flex operate a Dynamic Purchasing System (DPS) which enables FSPs to register on the site, facilitates the pregualification process and issues invitations to pre-qualified FSPs to bid for the services required. A key activity that Piclo offers is their enhanced marketing and engagement function to further encourage and facilitate participation. They offer support to FSPs during the procurement process to ensure a smooth onboarding of assets, prequalification, and bidding. All bidding takes place on the Piclo Flex platform,

Following assessment, decisions are also uploaded to Piclo Flex, automatically notifying bidders. For rejected bids, we include the reason, for example, 'insufficient capacity offered'. Participants will have already signed the Standard Flexibility Agreement to participate in monthly tenders, and once a bid is accepted, we issue a Contract Award Notification detailing the accepted individual services. The successful bidder will proceed to our operational process and will be scheduled for dispatch for the following month.

where pre-qualified FSPs upload bids for each individual competition. Following previous tenders, the platform introduced a "bulk upload" in response to stakeholder needs, allowing FSPs who want to take part in multiple competitions to upload bids as one file. This has reduced the burden on resources and made it easier for providers to submit timely bids.

#### Piclo Flex platform – all assets registered in SP Distribution



#### Piclo Flex platform – a live competition within SP Distribution



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# Facilitating market access

To date, distribution flexibility markets have focused on the provision of services to support long term network planning using flexibility services to meet network capacity needs that arise due to customer demand and generation growth.

"Our ambitions extend well beyond delivering distribution flexibility for network minimisation, management and restoration to enabling and facilitating flexibility for system optimisation."

#### Improving access and removing barriers

Following the low level of FSP response to our tender in Autumn of 2021 we commissioned Oxera to produce an independent report highlighting the barriers to participate in our flexibility market tenders and asking them to investigate and provide recommendations to address these barriers.

This report was produced based on engagement with a range of FSPs, industry stakeholders and Ofgem. The barriers outlined by our stakeholders largely aligned with the findings from Ofgem's Future of Distributed Flexibility consultation.

Our report identified 19 barriers that FSPs faced that may prevent or inhibit their ability to participate in flexibility services. These barriers were then categorised into four solutions groups:

- 1. Reducing barriers to entry
- 2. Improving co-ordination between DSO and ESO markets
- 3. Adjustments to DSO architecture
- 4. Encouraging participation in flexibility markets

We have taken steps to address these perceived barriers by:

- 1. Implementing an end to end flexibility platform with Piclo Flex, simplifying the process.
- 2. Adopting standardised processes for prequalification, flexibility products and flexibility contracts.
- Engaging stakeholders about our flexibility requirements.
- Developing a market prospectus which outlines our future requirements.



You can read the report in full here

#### Engaging our stakeholders

We have developed our stakeholder engagement strategy with the aim to reach as many potential and interested parties as possible, facilitating easy access to information on our policies and procedures for identification, procurement and operation of the services. This year, we have taken an active role in attending and presenting at various conferences.

We jointly hosted the annual Piclo conference in London promoting the work we have undertaken to develop our processes and procedures and to share the learnings from our trials. We held multiple one to one surgeries with providers to provide progress updates and to request feedback. We also began engagement with industry stakeholders such as Scottish Enterprise to develop partnerships and to grow flexibility services markets.

A common challenge highlighted by our stakeholders is a lack of awareness about our requirements and a lack of understanding on how they could participate in our tenders. To address this, we have improved the ways that we interact with both existing and potential FSPs. Prior to each tender, we now host a webinar for all that have registered or have expressed interest. These webinars provide an overview of the steps to participate in our tenders and an opportunity to engage with our flexibility team and the team at Piclo. In addition, we hold regular one to one surgeries with FSPs, providing an opportunity for them to feedback.

Recognising that the measures above focus on FSPs who are already aware of or engaged with flexibility markets, we also identify potential providers that are not aware. We have identified and engaged with potential FSPs based on those connected to our network(s) in areas where we have specific requirements and suppliers with large volumes of connected customers within our licence areas. Through this engagement we are increasing FSP participation.

#### Flexibility for system optimisation

In addition to using flexibility services to manage long term growth on our network, we are creating new market opportunities and exploring innovative ways that we can manage network issues.

We were the first DSO to launch a Reactive power tender, seeking services to manage voltage limits on the network and successfully demonstrated this approach working alongside Conrad Energy. The process we follow to undertake Reactive power tendering is as follows:

- Identifying flexibility services for operational purposes A cost benefit assessment is carried out by our Flexibility Team to determine the most economical and efficient solution based on the specific area of the network affected. Similar to network planning, an assessment of the proposed solutions will be undertaken, following which both technical and financial approval is required to progress the appropriate solution identified.
- Technical assessment The network will be assessed to determine the capacity required, the time the network is at risk, and the technical parameters such as voltage and response times. Further consideration of the types of and volumes of customers connected will be identified (e.g. hospitals) to ensure the most appropriate intervention is chosen, recognising the risks to customers) and the network.
- Financial assessment The financial assessment is carried out in the same way as for network planning, however the counter-factual is different. We will consider the potential CI/CML penalty (which reflects the disruption to customers of an outage) and then apply a probability of failure percentage calculated by assessing the likelihood of the network assets developing a fault during the period of the works. The cost of alternative solutions will also be considered to ensure that flexibility services remain the most economical solution.

This year we also launched our operational flexibility market, seeking flexibility services to provide network security to customers during planned outages on the network. These outages can last for a few days, depending on the scope of works being undertaken. During these periods, customer supplies are more at risk of interruption as the network is less resilient as we have had to take part of it offline to do work. This means that if a fault were to occur during these outage periods, customers would be more likely to lose supply. We can now use flexibility services during these periods to provide extra security of supply for customers.



## 4. Options assessment and conflict of interest mitigation

## Assessment of network options

Transparency of our evaluation methodology is key to addressing perceptions of conflicts of interest around intervention decisions we want to be able to clearly show how we reach decisions.

This year, to promote transparency on our decision-making process, we have published our <u>Decision-Making Framework</u> on our website. With regards to network assessment, the framework sets out exactly how we make two key decisions reading the use of flexibility services. Firstly, how we decide to contract with flexibility services as a solution, instead of using an alternative solution like reinforcement, and secondly, where we've contracted flexibility services, how we decide in, or near, real time to dispatch that flexibility service.

Our Decision-Making Framework sets out the stages we follow, from how we identify network requirements through to how we decide between different solutions and the principles we follow when we dispatch flexibility services. The Decision-Making Framework explains the input information, assessment criteria, and assessment tools we use to make decisions. The process set out aligns with the Flexibility First commitment made by all DNOs and the dispatch principles developed by the Open Networks project.

We've worked carefully to make the explanation of our assessment process and tools accessible to a broad range of stakeholders - in our Decision-Making Framework we've provided a summary explanation, and a more detailed explanation. Finally, we signpost to an even greater level of detail in our Network Development Plan – which you can <u>read here</u>.

### Continual annual assessment

Customers' needs change over time. That is why every year we reassess our entire load-related plan. Doing this incorporates updated forecasts and means we can: identify and progress solutions for new constraints we hadn't previously identified; reprioritise existing intervention programmes for example, where a constraint is now predicted to manifest a few years later or less severely than previously thought; and reassess solutions where the details of the constraint have materially changed.

There are five stages to the network assessment process which we ran this year. The completed activities are outlined on the right.

The tools we use in this process to ensure impartiality, and how we've calibrated to ensure they stay accurate, are described on the next two pages.

#### Stage 1 – forecasting

We develop our network to accomodate customer growth, so the first stage is to forecast customer requirements over the coming decades. We worked with stakeholders to update and republish our DFES in March 2024. This updated our forecasts for customer demand and generation metrics out to 2050. We've also improved two of our enhanced forecasting tools, which you can read about on pages 20-21.

#### Stage 2 – network assessments

We ran an entire assessment of our network out to 2050, from customer cutout fuses up to where it meets the transmission network. This was done using our ENZ Platform (see page 20), and comprised a programme of power flow analysis for every half hour for every forecast scenario – 175,000 iterations per network asset. Each iteration of the model requires around 20 hours of processing time using high-powered cloud-based Microsoft Azure virtual servers. It processes over 150k circuits and 70k transformers in each scenario, for both system intact and fault conditions. This industry-leading process systematically identified where, when, and how much and what type of additional network capacity we need to accommodate forecast growth.

#### Stage 3 – options assessment

Where Stage 2 identified new constraints, or identified that existing constraints had materially changed, we ran a comprehensive optioneering process. This uses data-driven assessment tools (page 21) to impartially assess a long list of solutions against defined criteria. This identifies the optimal solution. Where flexibility services are a technically viable solution (either as part of the solution or the whole solution), we calculate the ceiling price using the industry standard Common Evaluation Methodology tool (page 21).

#### Stage 4 – flexibility tendering

We ran two tender rounds seeking flexibility services for every constraint identified that it was technically possible for flexibility services to resolve. In total, across the tender rounds, we tendered for 570MW of flexibility services across locations, as outlined on page 17.

#### Stage 5 - intervention decision and flexibility service contract award

We proceeded to place contracts in every case where the tender provided the required volume of flexibility services within the ceiling price. This year, we have placed contracts for 29MW of need identified on our network.

#### Taking a long-term view

The methodology we follow and the assessment tools we use identify solutions that are efficient and economical over the long-term. This long-term view is ensured in a number of ways. In stage 1, our DFES forecasts (the foundation of the assessment) go out to 2050. In stage 2, our network assessments also run out to 2050. In stage 3, our linear optimiser (see page 21) selects the solution that minimises Net Present Value over the long-term, meaning that we are impartially identifying the most efficient solution(s) over the long-term.

We take this long-term view as some of the solutions we can use to provide capacity which will last for decades. We need to understand long-term customer needs and network capacity requirements to ensure that we know when it's most efficient to use shorter-term interventions or longer-term interventions. This approach means we identify the most efficient coordinated solutions that deliver value to our customers over the long-term.

We also test our solutions against a range of future pathways, ensuring that areas of sensitivity (for example, where it may be advantageous to defer high CAPEX investments until more information is known) are identified.







## Calibrating and improving our impartial network assessment tools

Having high quality, accurate, data-driven network assessment tools is important to assessing network intervention options fairly and making impartial decisions. This year we focused on improving our industry-leading network assessment tools.

#### Our forecasting tools

EVs and heat pumps are two of the main drivers of increasing network demand, and the forecast growth in these can change depending upon various factors. It is important that we maintain an up-to-date view of the uptake to ensure we can plan our network to meet these needs.

EV-Up and Heat-Up are two enhanced forecasting tools which we use to do this. They simulate how EVs and heat pumps are likely to roll-out across our network – and show us which individual households are likely to install them and in what timescales. This supports us in identifying the optimal solutions for accommodating the growth on our network.

It is important that we keep these tools calibrated to ensure we can have confidence in their output. This year, we compared previous EV-Up and Heat-Up forecasts what had actually come to pass, and fed actual results back into EV-Up and Heat-Up to improve future forecacsts.

In addition, as heat pump uptake is sensitive to government policies, we have been working with central and devolved governments to ensure that the forecasting logic used within Heat-up reflects recent strategies and policies.

#### Our Network modelling tools

Our ENZ Platform is our industry-leading network modelling tool which we use to identify where, when, and how much additional capacity we will need on our network in order to be able to accommodate customer growth.

This year, we have enhanced it by integrating OpenDSS, an opensource unbalanced 3-phase power flow simulator. This will increase the accuracy of the ENZ Platform (i.e. better identification of where, when, and how much capacity we need to deliver), by enabling us to assess phase-imbalance throughout the LV network as real time monitoring is rolled out.

Our tool is hosted in a development environment, so this year we have established a project team to integrate this tool into our IT systems. This multidisciplinary team across Digital, Data and Engineering, have developed a roadmap to homologate the ENZ Platform within our suite of IT systems and enable it to interface with our Planning, Network Operations, and Market Development systems.

This roadmap includes developing the capabilities to transform this from a medium to long-term planning tool into a real time planning platform over the course of RIIO-ED2. You can read more about our ENZ platform on page 13 of our Decision-Making Framework.

Primary Network

Network

homes

#### 2. Granular property-level forecasting



## **ENZ Platform**







## Managing conflict of interest through our tools and our publications

Having a transparent assessment process is not itself a guarantee of making impartial decisions free from bias – the assessment tools we use must also be free from bias and the decisions we make must be accessible and transparent.

## Managing conflict through impartial data-driven tools

A good way of ensuring our assessment tools are free from bias is by using industry standard tools and tools that rely on quantifiable data rather than qualitative 'gut feel' factors. By demonstrating to stakeholders that we use impartial data-driven tools, we help to address any perceived conflicts of interest around our intervention decisions.

We have four such tools to help us make impartial intervention decisions to contract flexibility services:

#### 1. Our enhanced forecasting tools

DNOs need to understand the rollout of LCTs on a granular scale – street-by-street or even house-by-house. This is because they are the main driver of highly localised LV network reinforcement, without a formalised system to translate DFES forecasts into much more granular forecasts, there is perceived or actual bias as to where we assume LCT uptake will occur. This is one reason we previously commissioned an external party to develop EV-Up and Heat-Up forecasting tools.

2. Our ENZ Platform network assessment tool This identifies where, when, and how much additional network capacity we need to accommodate customer growth. It does this by running power flow analysis for our entire network. The input data is either real network data recorded by network monitors and smart meters, or forecast data developed with stakeholder input and credible industry forecasts (the ESO's FES and the Climate Change Committee's 6th Carbon Budget). Where data about network assets was missing, these were filled using predictive AI rather than our engineers' making assumptions, which reduces the risk of any conservative assumptions entering the assessment process. by volume) we use a mixed-integer linear optimisation engine to determine the most economical combination, sequence, and

3. Our linear optimiser

#### 4. The industry Common Evaluation Methodology tool

This calculates the site-specific flexibility service ceiling price. This is the price beyond which a flexibility service is uneconomical and is key in determining whether flexibility services are contracted. This is an industry standard tool, developed by the Open Networks project and used by all DNOs.

In summary, we use four impartial tools that rely on quantifiable input data (either real recorded data or published forecast data developed with our stakeholders) to identify whether we should be using flexibility services or another solution. This removes the opportunity for an individual engineer's bias or preconceptions to affect our intervention decisions - thus making our decisions impartial and data-driven.

For HV and LV assessments (which form the great majority of our intervention decisions timing of solutions to meet the required level of network capacity by minimising NPV over the long-term. It is a mathematical tool that uses quantifiable input data, and impartially identifies the most economical combination and timing of solutions.

### Publishing our decisions

As well as bringing transparency to the process we follow on how we make decisions (by publishing our Decision-Making Framework - page 19), this year we have also worked to improve transparency to the individual decision outcomes themselves. Specifically, for each indiviudal constraint we provide details on:

- 1. The decision outcome the solution we're planning to use; and
- 2. The decision justification why we chose that solution over others.

We publish these in three places:

- 1. In our detailed Engineering Justification Papers for our entire RIIO-ED2 Load Related Expenditure plan. This year we republished our Engineering Justification Papers, which set out in full detail how we have assessed and developed our network plans for the next five years. They identify where we have sought and tendered for flexibility services as a means to provide capacity. This provides transparency on our individual investment decisions. (Engineering Justification Papers)
- 2. For interventions at EHV and above, we have a licence requirement (condition 25B) to publish biennially as part of our NDP. This year we updated our NDP, publishing an update in December 2023, and we have also issued a consultation on our NDP seeking views from our stakeholders which we can then use to improve the documentation prior to and in anticipation of finally publishing it on 1 May 2024 (as required by our licence). (Network **Development Plan**)

3. For interventions at all voltage levels, we have a licence requirement (condition 31E) to publish information on our flexibility tenders and outcomes. Our most recent update was published on the 30 April 2023, and this provides an overview of our decision outcomes relating to the procurement of flexibility services. (April 23 - C31E report)

In addition, after each tender and for all voltage levels, we notify all participants in the flexibility tender round of the decision outcome. Where a participant was unsuccessful, we provide justification for why they were not successful. We have run two tenders per year and so have done this twice in this year.

We are currently trialling the provision of a more accessible 'Distribution Network Options Assessment' for capacity driven investment decisions. These DNOA publications would provide more detail on the nature of the constraint, a summary and justification behind the investment decision, and flexibility metrics for where flexibility forms part of the solution. We launched a consultation this year, seeking feedback from our stakeholders on our proposed approach.

In summary for this year, we have published decisions, justifications and outcomes for all RIIO-ED2 planned expenditure, and decision outcomes for all voltage levels where these relate to using flexibility services. In addition, we've been doing the work, analysis, and stakeholder consultation to put us in the position to publish, for the EHV network, all individual decision outcomes and their associated decision justifications early in the 2024/25 regulatory year.



## Managing conflict of interest through our structure and our governance

At the heart of our recently established DSO organisational model are the three core roles of the DSO, supported by the fourth and fundamental role of Data and Information.

These four roles make up what we consider to be the roles and activities of the DSO, and within SPEN, these are managed and steered by our Network Planning and Regulation Director.

Following the Utilities Act 2000, which required our vertically integrated company to create legally separate entities for each of our ScottishPower Group assets, we took the opportunity at this time to create legally separate asset owner companies for our SP Distribution (SPD), SP Manweb (SPM) and SP Transmission (SPT) assets. At this time, this created new asset owner companies for SPD, SPM and SPT, and three service provider companies.

Within the asset owner companies, we identified a group of multi-disciplinary staff whose responsibility was to ensure that the Licencee's interests were protected at all times. This became Network Planning and Regulation. This department brought together asset risk management, data management and integrity, and regulatory reporting and compliance. Our Network Planning and Regulation function manage the specific interests of the license companies, headed up by a main Board Director – Scott Mathieson – who reports into the board of the licences. The DSO activities, as defined today, are an evolution of the activities which sit within the Network Planning and Regulation Directorate.

Separately, three service provider functions are responsible for the day-to-day delivery of the

inspections and maintenance programmes, new connections activity, and the delivery of the capital programme, including the construction of new projects. The delivery programme including clearly defined cost targets and performance incentives - are set out by the Network Planning function for each of the threeservice provider functions. Through a service level agreement – defined as our targets and milestones documents – the service providers are provided with a direct translation of the regulatory contract. These defined cost targets and performance incentives are used to set director objectives, and board level plans and targets. Delivery of the programme is monitored by our Network Planning and Regulation department, and reported to the Board to ensure that performance is monitored and that the regulatory contract is achieved. Strict commercial disciplines are applied at the assetowner/service-provider interface.

In RIIO-ED2, the addition of our Independent Net Zero Advisory Committee adds a further layer of governance, and oversight. Appointed in 2023, and chaired by Angela Love, the committee acts as the voice of our stakeholders. challenging our developments as they emerge, and provides valuable expertise across consumer advocacy, customer connections, academia and trade. You can read more about our structure and governance on our <u>DSO</u> website, and on our dedicated INZAC webpage.



## Our Independent Net Zero Advisory Committee

Independent oversight of our activities and decision making processes is an important component of addressing perceived and actual conflicts of interest. Our Independent Net Zero Advisory Council (INZAC) is our oversight committee. This is a group of 15 independent external stakeholders from consumer advocacy, generation and storage customers, academia, other whole system vectors (e.g. rail), trade associations, finance, the CMA panel, and the ESO. With a wealth of experience and expertise from across the energy industry and beyond, the INZAC has a critical role in overseeing and challenging our efforts to enable the path to

#### Our DSO Roles

Role 1 – Planning and Network Development looks years into the future to establish where, when, and how much network capacity we need to add to accommodate customer growth, and how best to deliver that.

Role 2 – Network Operations manage the network in real time, endeavouring to keep the lights on for our customers 24/7, optimising the network and keeping our customers and staff safe.

Role 3 – Market Development establishes processes which enable us to contract with FSPs, and help grow efficient, coordinated, and competitive flexibility service markets.

Role 4 – Data is essential to optimising assets and driving innovation. Our strategy is built on prepared, trusted and shared data, which enables us and our stakeholders to make data driven decisions.

Net Zero, delivering for the customers and communities it serves. The INZAC is chaired by renowned industry expert, Angela Love, who has over 30 years' experience of the UK/EU gas and electricity markets. This year, we met with the INZAC five times on DSO issues. Relevant to this section on conflict of interest, two of our meetings were about our Decision-Making Framework (which the INZAC reviewed and provided input to) and two meetings were about our network planning process and tools.





# Our whole system approach to network assessment

The energy system is becoming more interactive, so greater coordination between parties is needed to maintain efficient network planning and safe and reliable network operation.

## Our activities from the last year

Customers depend on us to provide network capacity to accommodate their decarbonisation growth, the rate of which will be partly determined by central and devolved government policies. Other parties, such as the ESO, depend on access to the flexibility providers connected to our network to maintain a safe and secure GB system. Other network companies, such as the transmission network owner, need to understand what is happening on our network as it will affect power flows on their network. This year, we have appointed our team, updated our materials, supported regional and devolved government projects, and increased our engagement activities across various industry forums and working groups:

#### - We appointed our Strategic Optimisation team

Our newly appointed team has supported our 22 Scottish local authorities to develop their Local Heat and Energy Efficiency Strategy (LHEES) submissions to Scottish government. This support included proactively developing a LHEES tool for each Local Authority to complete highlevel analysis and develop their plans, building on our network information. We've also been actively involved in the development of our eight Welsh local authorities' equivalent Local Area Energy Plans (LAEPs), and have laid the groundwork to extend this support to our 10 English local authorities. See page 6.

#### Low Carbon Technology Optioneering developments

This year, we supported local authorities to optimise the design and implementation of public EV charging and heat electrification initiatives, including providing costs and timescales for 1,400 potential EV locations and 800 potential heat decarbonisation locations. We are actively working with Fife Council and Liverpool City Council to develop a heat network proposal for Dunfermline and four locations in Liverpool. These activities place us at the heart of our local authorities' decarbonisation plans – the insights this gives us informs our network development plans, meaning they are coordinated with our local authorities' ambitions and plans, and we are able to provide our skills, knowledge and resources to help realise local ambition.

- We updated our Distribution Future Energy Scenarios Our Distribution Future Energy Scenarios provide geographically granular forecasts for customer metrics out to 2050 as a result of GB's transition to Net Zero. It is built on the ESO's 2023 Future Energy Scenarios, to ensure our starting point already has a holistic GB and cross vector transmission and distribution view. We also use the standard building blocks developed by the ENA Open Networks project, which means our forecasts are easily comparable with those of other network companies, helping to support cross-network coordination. In addition, developing our updates involves extensive engagement with central government, devolved governments, local authorities, and other stakeholders. This year we engaged with over 100 external stakeholders in updating our DFES through a range of events. We engaged heavily with local authorities to ensure our forecasts reflect local ambition. As the DFES is the foundation on which we plan our network, this means whole system coordination is embedded from the start.

## We developed a register of projects with strategic significance

Some projects will be significant catalysts for Net Zero and would benefit from enhanced visibility and coordination, in particular cross vector projects. This year, we have worked with stakeholders to develop a register of projects with strategic significance on our network. This register includes the nature of each project, including location, capacity requirement and evolution, links to government targets, policy landscape and any additional support needs – enabling us to provide a proactive and tailored service to these initiatives.

#### - We held detailed joint planning meetings

This year, we have held detailed joint planning meetings and data exchange engagements with all TOs and DNOs adjoining our distribution licence areas including NGET, SPT, NGED, ENWL, SHEPD, NPg, and with the ESO.

#### We jointly developed a holistic transmission & distribution solution for mid-Wales

We are working closely with NGET, NGED, and Welsh Government to jointly develop a holistic transmission and distribution solution that best meets the long-term capacity needs of all parties in Wales, including communities and network customers. This is a multi-year project; this year we have been assessing a wide range of joint options, and are working to narrow these options to a set of preferred solutions over the course of 2024.

#### - We became members of Strategic EV Connections Working Groups

With Transport for Scotland, Transport for North, and Transport for Wales to optimise the delivery of public EV charging points, and we supported Transport for Scotland and Transport for Wales with optioneering to facilitate EV connections. We also provided cost and timescale information for our Scottish and Welsh emergency services colleagues to aid their fleet vehicle transition. We are working to develop relationships with the equivalent organisations in England.



## 5. DER dispatch **Decision Making** Framework

## Increasing our network visibility

Visibility of our network and visibility of Distributed Energy Resources (DER) characteristics are both vital for ensuring efficient and stable system operation and for providing transparency.

"This year, we have increased visibility of our network through our roll out LV network monitors and incorporating smart meter data."

## Increasing network visibility to inform dispatch decisions

Our Network Visibility Strategy sets out the need for increased visibility of near-time and real time network power flows. These are important to better understanding when we need to dispatch flexibility services and other operational solutions – it means we make more informed and efficient operational decisions.

This year, we have increased visibility of our network through our roll out of LV network monitors and incorporate smart meter data. This year, we installed c. 1400 LV network monitors, and we developed the background internet of things (IOT) solution which enables data capture from LV monitors and smart meters. This IOT solution captures the data and enables sharing with our business intelligence platforms and ENZ Platform – without this IOT solution, we would not be able to visualise and use LV monitoring and smart meter data.

We have also increased visibility of our network through real time monitoring of new DER customers. We've equipped all DER customers connected this year at 132kV, 33kV, via a dedicated 11kV feeder, or who exceed IMW, with real time monitoring. This enables generation and consumption data to be used in the management and planning of operational actions.

In this year, we have also commenced the development of enhanced capabilities to enable real time visibility of our network, commencing the development of our planned real time network visualisation platform. This will integrate previously independent data sources across network monitoring, smart meters, weather forecasting, enhanced forecasting, asset condition, and use them to produce network analytics to tell us what is happening on the network right now, and what will happen in operational and planning timescales. This is a big step forward in network analytics and will help us better identify when we need to dispatch flexibility services as well as give more notice of our dispatch decisions.

In addition to improving our data and our information, these activities increase our visibility of when we need to dispatch flexibility services and ensure that the decisions we take are informed, data driven, and do not result in conflicting actions being taken on the wider electricity network.

#### **Ensuring and sharing visibility** of DER characteristics

Recording and having visibility of DER characteristics is important to identifying potential adverse knock-on impacts if we dispatch them, and means we can share this data with other stakeholders, including the ESO. Our activities this year ensure that DER characteristics are accurately recorded and embedded into our planning and operational decisions and shared with stakeholders.

#### 1. For customers connecting at HV and above

We have used our established process (in place before this year) to record DER characteristics and feed this through to our network planning and network operating decisions. The process in summary: we record DER characteristics when they apply for a connection. When they accept the connection offer, we add their characteristics into our authorised network planning model, meaning future connection offers to other customers take account of their characteristics. Then when they connect, we update our network operational model. This second model is used by our control room to understand the impact of operational actions. This process means our network planning and operational actions take account of DER characteristics. This year we have improved the governance of the process by appointing a dedicated model management team given the importance of the two models, we wanted to ensure they were updated correctly with DER characteristics and that there is clear responsibility.

#### 2. For low voltage connections

The process depends on whether they are classed as G99 or G98 (the size threshold is 16A/phase). For G99 customers, the process is similar as for point 1 – we record the data at point of connection application and transfer it into our LV models. G98 customers do not submit connection applications to us - they 'connect and notify' instead. When they notify us, they send us the G98 ENA Type Test certificate, which contains

the technical information. Like all DNOs, we face a challenge of G98 customers not notifying us that they've connected LCTs. This means we don't receive the technical information we need. To address this gap, we're rolling out two projects that are built on innovation-funded projects. First, our Identify project - when an LCT installer goes to a house to install a G99 or G98 LCT (e.g. an EV chargepoint), we take the opportunity to capture information about other LCTs and check the rating and condition of their fuse. This is done via an app that links to our systems; it gathers five times more information than we were previously getting from traditional notifications. Second, we've been developing our Disruptive Technologies project this year – the plan is that whenever domestic customers approach us for another service (e.g. asking us to move their electricity meter), we would survey them to ask about other LCTs they have in their home. This year we have been updating our survey language to make it more customer-friendly, to ensure it yields more meaningful data and a greater response rate. These two approaches help us fill the data gaps and keep our models up-to-date.

#### Sharing DER characteristics with stakeholders

Collecting this DER data enables us to share more informed data with stakeholders – the DER data we record and embed in our internal models is the same data we share with stakeholders via our Embedded Capacity Register (ECR) and our Long Term Development Statement (LTDS).



## Deciding when to dispatch DER

**Our Decision-Making Framework** explains how we decide to dispatch flexibility services near and in real time, outlines the principles we follow, details how we are developing primacy rules with the ENA's Open Network project, and sets out how we coordinate decisions with the ESO.

"We need infrastructure to be able to dispatch Distributed Energy Resources and flexibility services on our network."

### Developing scalable dispatch infrastructure

We need infrastructure to be able to dispatch Distributed Energy Resources and flexibility services. As network operation becomes more interactive and as we operate closer to network limits, we need to be able to dispatch flexibility services alongside other operational actions in real time.

This capability is being rolled out via our Constraint Management Zones (CMZ) – regional control platforms that coordinate our automated operational actions in real time, whilst ensuring there are no adverse interactions and that network power flows stay within limits. This year, we have:

- 1. Developed a CMZ technical specification for tender, which sets out requirements for how they should operate to maximise the availability of our network for DERs, and what features they should support, including operational safeguards and curtailment reporting.
- 2. Reprioritised our programme based on updated customer connection interest and transmission/distribution boundary limits. The implementation of T/D boundary limits will enable customers to connect via a CMZ who would otherwise be unable to connect due to constraints within the transmission network. This will remove a significant barrier to DER development in our licence areas.
- 3. Tendered for all CMZs we plan to deploy in RIIO-ED2. This process is about to conclude.
- 4. At Dunbar GSP we've decommissioned the legacy obsolete Active Network Management scheme (a prior version of CMZ) and replaced it. The original scheme was the first of its kind in GB when it was commissioned in 2015. It successfully enabled DERs to connect to Dunbar GSP up to nine years in advance of required transmission reinforcements. We decommissioned it as its hardware and software were end-of-life and unsupported, and it was no longer required for the original need.
- 5. We have connected DERs to the Newton Stewart and Coylton CMZ schemes (delivered in RIIO-EDI) and are now actively managing those for the mitigation of constraints within the transmission network.

In summary, we have progressed scalable, non-proprietorial dispatch infrastructure and infrastructure that means we can safely expand the use of flexibility services and coordinate their use with other operational actions.

### **Coordinating closely** with the ESO

The ESO is the other major user of flexibility services from DER connected to our network. They need these services to help keep the GB system in balance. They also need these services to restart the system in the event of a widescale black start. It's therefore important we coordinate with the ESO on DER use and dispatch. This year, we have:

#### 1. DER data sharing with the ESO

The ESO has access to all the DER data we share publicly (see pages 21 and 24), including where we've contracted flexibility services. In addition to this public data, we share more detailed DER data and network models with the ESO via the Week 24 process. Separately, we have initiated an industry workstream in December 2023 to ensure that the ESO gets consistent data on distribution-connected electricity storage (a key DER provider of flexibility services). Together, this means the ESO knows where we've contracted flexibility services, where DER are connected to our network, and our published network models contain DER characteristics.

#### 2. DER market development and coordination with the ESO

We have worked closely with the ESO on their Local Constraint Market (page 7) and MW Dispatch products. These products are examples of DER providing a response for transmission requirements. They provide system operation benefits whilst safeguarding the distribution network and are achieved through us coordinating with the ESO. We have maintained non-exclusive flexibility service contracts as standard, so our flexibility service providers are not contractually prevented from also offering services to the ESO. Finally, our flexibility service providers are obliged to tell

us where they are committed to providing services to the ESO, so we can manage any potential conflicts.

#### **3.** Increasing the transparency and predictability of DER dispatch

We follow standard dispatch principles developed by the Open Networks project (as explained in our Decision-Making Framework), and are working with the ESO (via the Open Networks project) to develop standard primacy rules. Separately, we have been leading industry to standardise electricity storage network access rights (page 9). This second point is relevant as it provides far greater clarity and commonality to the circumstances in which this source of valuable DER flexibility services will be constrained and so unavailable to provide flexibility services.

#### 4. ICCP links with the ESO

We already have an ICCP link with the ESO from our TO control room. This year we have initiated discussions with the ESO to connect our distribution control rooms to the ESO with ICCP links. These discussions are working towards our aim of agreeing the technical specification in the 2024/25 regulatory year.





## Leading the industry

Our Network Visibility Strategy focusses predominantly on improving visibility of the LV network, as we already have good visibility on the HV and EHV networks. Greater visibility of the LV Network, coupled with our new tools, specialised personnel, and data analysis techniques are revolutionising the way we manage and operate the LV network.

#### Our LV support room

The Low Voltage Support Room is our new and innovative capability for managing a more dynamic Low Voltage (LV) system as our customers increasingly adopt low carbon technologies. The LV Support Room is increasing network security, flexibility, and reliability through improved network visibility - not only on our low voltage system, but increasingly at HV and EHV. The increasing roll-out of customer smart meters, coupled with our deployment of low voltage substation monitoring means we have greater visibility of the LV system than ever-before. Through new tools, specialised personnel, and data analysis techniques we are revolutionising the way we manage the LV network.

#### How is it different to what we had before?

The conventional DNO method for managing the LV network was passive, reactive, and heuristic. Customers would experience flickering lights before experiencing a fault, and in many cases the DNO only knew a fault occurred when customers reported a loss of supply. Peak LV demand was recorded from an analogue monitor once a year, with system reinforcement works planned in response to blownfuses, faulted cables, or customer complaints. In the new DSO LV Support Room, we are beginning to manage a dynamic LV network with proactive and analysis driven interventions. We are collating fault data from LV monitors to keep customers informed and using voltage and harmonic data to intervene before a fault occurs (also avoiding costly and damaging neutral faults). We can monitor loading in some areas in real-time, allowing us to identify where the network is approaching capacity and to plan interventions in response. Greater visibility of capacity and demand will allow us to run informed local flexibility tenders and maximise the capacity of our existing assets.

The LV Support functionality is now fully embedded in our SP Distribution and SP Manweb licence areas, delivering five capabilities:

- . Support for field staff, enabling them to repair faults faster e.g., using live data to provide impedancebased fault locations.
- 2. Identification of network anomalies that require intervention prior to the onset of faults e.g., early identification of faults through observed anomalies.
- 3. Improved planning for the design to resolve network issues. e.g., pre-fault projects and work packs provided which capitalise cost for network anomalies.
- 4. Improvement of technologies used to optimise the LV network e.g., in-house GIS app integrating datasets alongside training to field staff.
- 5. Updating company policies to optimise process and outputs, in order to keep pace with LV support room technology e.g., LV fault location approach.

As an example of our LV support room in practice, monitoring of smart meter data will inform a DNO whether electricity to an area is on or off. By introducing intelligent analysis tools, the LV support room can compare voltage alert thresholds to provide real-time visibility of LV network faults before they emerge. This creates a 'HV control room' style environment, allowing field staff to be dispatched to locations before a fault occurs.

Currently 54% (903,671) of homes in SP Distribution and 45% (754,931) of homes in SP Manweb have smart meters installed. The UK government is consulting on its proposal for suppliers to install smart meters in at least 80% of homes and 73% of small businesses by the end of 2025. This will expand the area of network the LV Support Room is able to cover, however there remains limitations with the smart meter data DSOs are able to access. To fully unlock their potential, DSOs must have greater access to smart meter data in realtime and at a more granular level. With further demand on the LV network to manage increased capacity for low carbon technology, and as we further develop our capabilities; the role of the LV support room will continue to grow. We are continuing to develop our advanced analytics capability to uncover new ways to solve traditional network problems economically, efficiently, and in the least disruptive ways for customers.





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## Evaluating our delivery of DSO benefits

#### A summary of our performance against Ofgem's evaluation criteria is set out below.

Title	Ofgem Ranking	Description	SPEN view	Evidence provide
Level of ambition	Average	Benefits from DSO activities (eg flexibility) are well evidenced and correspond with ambition in DSO strategy.	Advanced	
	Average	Consideration of the impact of DSO activities on different types of consumers, network users and the wider energy system (including carbon emissions).	Advanced	
	Average	Quantification of benefits is consistent with established methods for economic appraisal (eg HMT Green Book).	Advanced	
	Good	Evidence that the DNO is promoting wider system benefits (eg greater network access for DER and better coordinated dispatch across the Transmission / Distribution boundary).	Advanced	
	Excellent	Evidence that the DNO is taking a proactive role on regional cross vector investment planning and interfacing with local actors (eg LA and GDNs).	Advanced	Outlined on pages 5 – 9
Benefits realisation	Average	Clear articulation of actual benefits the DNO has realised within the RIIO-ED2 period through the delivery of its DSO strategy.	Developing	
	Average	Robust processes / KPIs for tracking benefits.	Developing	
	Good	Evidence that the DNO has quickly and proactively adapted existing plans and course-correcting where opportunity to increase benefits.	Advanced	
	Excellent	Evidence that the DNO has delivered additional outputs that seek to maximise benefits for customers.	Advanced	



## Evaluating our data and information provision

#### A summary of our performance against Ofgem's evaluation criteria is set out below.

Title	Ofgem Ranking	Description	SPEN view	Evidence provid
Scope, granularity	Average	Comprehensive data and information provision across planning, operational and market roles, including at a minimum the dataset out in the DSO Baseline Expectations.	Advanced	
and accuracy	Average	Use of third-party data considered, including harnessing smart meter data.	Developing	Outlined on
of data	Average	Clear evidence that the distribution network company is taking steps to improve data quality, with processes in place to address gaps in datasets and drive up standards.	Advanced	
	Average	Consideration of how to ensure data and information published is as accurate and unbiased as possible.	Advanced	pages 10 – 12
	Good	Clear evidence that the DNO is sharing additional data and information, where it has identified stakeholder value.	Advanced	
	Excellent	The DNO is leading the sector in promoting planning, operations and market data availability.	Advanced	
	Excellent	The DNO is sharing underlying methodologies and other insights beyond output data.	Developing	
Accessibility	Average	The DNO has considered how to adapt data and information provision to DSO Stakeholders' needs.	Advanced	
of data	Average	Data is available in an accessible, common format and readily available in a logical, easy to access location.	Advanced	
	Average	Evidence that industry standards are consistently being considered or applied.	Advanced	
	Good	Tailored approach to provision and clear evidence of how DSO Stakeholder engagement is being used to influence and improve provision.	Advanced	
	Good	Data is available in an accessible, common format.	Advanced	pages 13 & 14
	Good	Data is readily available in a logical, easy to access location.	Advanced	
	Excellent	Provision of network models.	Developing	
	Excellent	Consistent and standardised use of Application Programming Interfaces (APIs) to allow DSO Stakeholders to automate their data collection.	Advanced	



## Evaluating our flexibility market development

#### A summary of our performance against Ofgem's evaluation criteria is set out below.

Title	Ofgem Ranking	Description	SPEN view	Evidence provid
Design of distribution	Average	Distribution flexibility services products, contracts, and qualification criteria are standardized, and where not, credible justification is provided.	Advanced	
	Average	Following industry standard practice, e.g., implementing Open Network Project deliverables and where not, credible justification is provided.	Advanced	
products,	Average	Extensive DSO Stakeholder engagement has been undertaken to identify and address key issues hindering flexibility market development.	Advanced	
contracts and	Average	The DNO can demonstrate it has avoided proprietary systems.	Advanced	
processes	Good	The DNO has implemented in full the current set of Open Network Project deliverables, and made improvements in response to DSO Stakeholder feedback.	Advanced	Outlined on pages 15 – 17
	Good	Clear evidence that the DNO is unlocking the value of flex and energy efficiency in more nascent areas, eg constraints on the secondary (LV and HV) network.	Developing	
	Good	Clear plans to enable secondary trading of flexibility and curtailment obligations to be fulfilled.	Developing	
	Excellent	The DNO is setting an industry leading benchmark for distribution flexibility products, contracts and processes.	Advanced	
Facilitation of	Average	Clear explanation of how the DNO is enabling third parties to provide market support services and platform services.	Advanced	
market access	Average	Clear evidence that the distribution network company has undertaken initiatives to improve market access and enabling simple, cost-efficient participation have been effective.	Advanced	
	Average	Limited exclusivity clauses with credible justification where used.	Advanced	
	Good	The DNO is demonstrably providing operational data to the GB System Operator and other distribution network companies in a practical and accessible way (for instance via an Inter-control center Communications Protocol (ICCP) link) to provide visibility and to coordinate / avoid conflicts.	Developing	Outlined on pages 17, 18 & 2
	Good	The DNO can demonstrate that its commercial arrangements with DER enable better coordination with the GB System Operator.	Developing	
	Excellent	Clear evidence that the distribution network company's ambition extends beyond delivering distribution flexibility (for network minimisation, management and restoration) to enabling and facilitate flexibility for system optimisation.	Advanced	



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## Evaluating our options assessment and conflict of interest mitigation

#### A summary of our performance against Ofgem's evaluation criteria is set out below.

Title	Ofgem Ranking	Description	SPEN view	Evidence provid
Assessment of network	Average	Evaluation methodology used to assess options to resolve network needs is clearly defined and accessible to DSO Stakeholders.	Advanced	
	Average	Options assessment involves demonstrable cross-sector engagement, optioneering and planning with other sectors or vectors.	Advanced	Outlined on pages 19 & 20
options	Average	Evaluation methodology used to assess options to resolve network needs has a consistent approach to valuing alternatives to conventional network reinforcement, including flexibility and energy efficiency.	Advanced	
	Good	Proactive engagement with other network companies and current / prospective network users to resolve network needs.	Advanced	
	Excellent	The distribution network company has demonstrated the solution is economic and efficient over the long term, recognising the option value that flexibility and energy efficiency can provide.	Advanced	
	Excellent	The network options assessment has demonstrated how wider whole system options have been assessed to deliver identified needs at lowest cost.	Advanced	
Management	Average	Demonstrable executive level accountability and board-level visibility of DSO decisions.	Advanced	
of conflicts of	Average	Transparent, clear and separate decision-making frameworks supported by independent oversight.	Advanced	Outlined on pages 21 – 23
interest	Good	Outcomes of investment decisions are available on the distribution network company's website in a clear, accessible format.	Advanced	
	Good	Demonstrable, wide-ranging stakeholder buy-in to the distribution network company's approach and measures, including from market participants.	Developing	
	Good	A clear evidence base put forward to justify the distribution network company's approach.	Advanced	
	Good	Formalised distribution network company-DSO relationship (e.g. operational agreement, decision-making framework, distribution network company-DSO code).	Advanced	
	Excellent	The distribution network company's approach has been developed and validated through extensive DSO Stakeholder engagement and is backed up by compelling evidence.	Advanced	
	Excellent	The distribution network companyis applying best practice, learning from other network operators and updating its approach in line and wider industry developments.	Advanced	
	Excellent	The distribution network company is delivering opportunities to both seek and share insights from across the sector, driving improvements not only within their organisation but across the sector as a whole.	Advanced	



## Evaluating our DER dispatch decision-making framework

#### A summary of our performance against Ofgem's evaluation criteria is set out below.

Title	Ofgem Ranking	Description	SPEN view	Evidence provid
DER visibility and dispatch	Average	The DNO has comprehensive and robust visibility of DER characteristics and data parameters to inform effective and coordinated dispatch instructions.	Advanced	
	Average	Clear and transparent decision-making framework for when DER are instructed to dispatch in real-time, including primacy rules and comprehensive optimisation processes for coordinating dispatch instructions for DSO and GB System Operator flexibility services and curtailment.	Advanced	
	Average	Operating an efficient, scalable dispatch instruction infrastructure, with clear definitions and transparent rules.	Developing	
	Good	Enhanced DSO-GB System Operator communication channels, eg complete ICCP link installations.	Developing	Outlined on pages 24 – 2
	Good	Increased DER participation in GB System Operator markets.	Developing	
	Excellent	Optimised whole system coordination of DER to resolving conflicts of services across GB System Operator and DSO.	Commenced	
	Excellent	Leading industry in ensuring dispatch logic is consistent and adhered to.	Commenced	





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