SP Electricity North West

Operational Decision Making Framework

February 2026

SP Electricity North West

Index

SP Electricity North West

1. About Us

SP Electricity North West is one of 14 Distribution Network Operators (DNOs) in the UK, regulated by Ofgem. We operate the local electricity network and distribute electricity to 2.4 million homes and businesses in the North West.

Figure 1-1 - SP Electricity North West service area

We are responsible for maintaining and upgrading 13,000 km of overhead power lines, more than 44,000 km of underground electricity cables and nearly 500 major substations across the region. We supply electricity to the diverse communities in the North West of England all the way from Macclesfield to Carlisle.

Our network in the North West is one of the most reliable in the country and we are investing £1.9 billion between 2023-28 to ensure we continue to deliver an excellent, safe and affordable service to all our customers.

From 1 April 2023, we entered a regulatory price control period referred to as RIIO-ED2, which runs until March 2028. During this period, we will see significant change in the way and amount of electricity that is generated, consumed and stored, driving innovation across the whole energy system both now and into the future.

2. Purpose of this Document

In February 2024, we introduced our first Operational Decision Making Framework (ODMF), addressing stakeholders' need for a consolidated understanding of our decision-making process. Throughout the year, we have actively engaged with stakeholders, industry players and our DSO Stakeholder Panel to refine our ODMF and ensure transparency and clarity in operational decisions.

The ODMF report sets out SP Electricity North West's approach to decision-making surrounding how, when and where we use network automation systems, flexibility measures (such as Flexibility Services, Flexible Assets, and Flexible Connections) or other intervention (such as reinforcement), as well as human decision-making to manage constraints on our network.

It outlines key use cases and establishes the hierarchy of decision-making processes and systems.

The ODMF explains how we are digitalising the network and utilising network automation systems which facilitate faster, reliable, and consistent decision-making and enable us to fulfil our commitments. It also explains how we retain human oversight of these automation systems, allowing users to ensure the systems are delivering upon our commitments and providing the fallback capability to switch to manual operation if these systems become unavailable or there is a need to on the grounds of safety.

As part of our ODMF, there are Primacy rules in place to coordinate the SP Electricity North West and NESO flexibility services, minimising service conflicts, allowing FSPs to participate in both NESO and DSO markets, whilst promoting transparency and whole system efficiencies.

Document Audience

This document is intended for *all users of our network* providing a clear understanding of how we apply our operating principles to ensure safety, reliability, and security of supply - while minimising cost and carbon impact.

It also enables *stakeholders and relevant authorities* to review the efficiency and transparency of our decision-making and provide feedback for improvement.

Finally, this document supports existing or potential *Flexibility Service Providers*, i.e. customers considering Flexible Connections or participation in Flexibility Services. Its aim is to help these customers better understand these types of connections and services, the associated benefits and risks, and the information and support available from SP Electricity North West.

2.1. What's new in the 2026 ODMF

This document marks the third iteration of our ODMF. Updates reflect adjustments to our policy and strategic updates, flexibility and dispatch enhancements, and stakeholder engagement. Key updates include:

- A new Social DSO strategy and the addition of "Social Value" as a core operational principle, reinforcing our commitment to an inclusive energy transition.
- Enhanced flexibility market integration through the ElectronConnect platform, supporting API-based interoperability for dispatch instructions.
- Our Active Network Management (ANM) successfully went live in January 2025, supporting real-time flexibility and network optimisation.
- Following stakeholder consultation, we have adopted the Last In First Out (LIFO) methodology for curtailing Part 4 connections, supported by a dedicated explanatory section.
- Expanded data sharing through our Open Data Portal to improve transparency and facilitate industry-wide data sharing
- Industry governance updates, including the Market Facilitator's role in implementing primacy rules and supporting market integrity.

3. Our role in DSO

3.1. The future Energy System

The electricity network is undergoing the most significant transformation in its history. To meet the UK's ambitions of becoming a net zero economy by 2050, and to support the growing digitalisation of almost everything we do in life, it is increasingly important that the electricity network is at the forefront of this journey. As more people rely on electricity for heating, transport, and daily activities, the role of the network becomes ever more critical, and as network operators, we must demonstrate that we are making optimal operational decisions. This means ensuring the network is resilient, flexible, and intelligently managed to meet growing demand while enabling a low-carbon technologies.

3.2. Our DSO Strategy to Facilitate Net Zero

As the electricity distribution network operator for the North West, our responsibility is to facilitate the decarbonisation of transport, heat, and the wider energy system, at the lowest cost to our customers while maintaining high levels of network reliability.

Distribution System Operation (DSO) is central to this transition.

Through three core functions, DSO provides the systems, tools, and processes needed to operate a smarter, more flexible energy network fit for a net zero future. An overarching objective of those three functions is the transparent use and sharing of Data and Information.

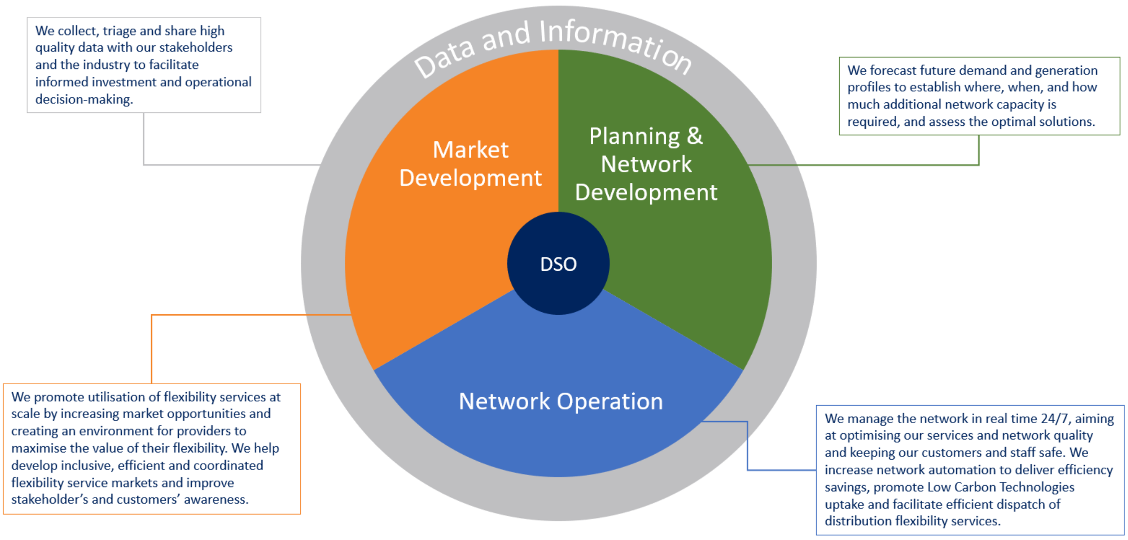


Figure 3-1 - Our core DSO functions

3.3. Our Operational Decision Making Principles

SP Electricity North West's operational decision-making is based on a set of key principles that we use when we operate and manage network, including forecasted constraints or unexpected events. These are shown in the Table 3-1 below:

Table 3-1 - Our Operational Decision Making Principles

Safety: Prioritising the safety of everyone interacting with and impacted by our network.
Security and reliability: Continuously enhancing the reliability of the electricity supply.
Efficiency: Operating with optimal efficiency to deliver value for money to customers.
Transparency: Upholding transparency in our operational decision-making processes.
Sustainability: Delivering sustainable solutions taking into account our carbon footprint.
Social value: Ensuring the energy transition is inclusive, supporting local economies and resilience.

These priorities underscore our dedication to serving the community and fostering trust in our operations, while making sure that customers are only paying for things that are needed.

As a business, we are investing in the digitisation of our assets, systems, and processes with a focus on enhanced efficiency and standardisation in our decision-making. However, we maintain human decision-making components and manual override if the automation systems are not operational, or during periods where there is a safety or security of supply need to discontinue automation.

3.4. Social DSO in Operational Decision Making

Our new social DSO strategy is about making sure the energy transition is inclusive, fair, and does not leave behind vulnerable customers, time-poor or resource-stretched organisations, such as local services or small businesses.

Therefore, as a social DSO, we make our network investment decisions and build our operational decision making framework considering how to create widespread benefits across the country, such as supporting economic growth and community resilience, enabling community energy projects, accelerate low carbon connections and make flexibility markets more inclusive.

Case Study:

As part of our commitment to our Social DSO principle, SP Electricity North West have worked collaboratively with the Greater Manchester authorities to deliver tangible benefits for the region aligned with the Greater Manchester Strategy (GMS) metrics.

Through targeted LV flexibility initiatives, we have enabled nearly 68,000 households and small businesses to participate in our flexibility market, offering additional income opportunities and better energy management, empowering them to optimise energy use, including additional funding to extend beyond the usual groups to include those at risk of being left behind.

In FY2025-26, we have offered 2,485 MW of flexible capacity across the region, contributing to the GMS goal of accelerating the low-carbon transition and reducing carbon emissions, by avoiding emissions associated with reinforcement works and reduced operational costs through flexibility procurement instead of physical upgrades.

In addition, we have strengthened network resilience by using flexibility services to manage peak demand and maintain supply during outages or fault conditions, reducing disruption for vulnerable customers and improving reliability.

We have also deferred costly network reinforcement by leveraging flexibility, which means communities experience fewer disruptive infrastructure works and benefit from faster integration of low-carbon technologies such as EV chargers and heat pumps without waiting for traditional upgrades.

These actions demonstrate how our joined-up approach delivers measurable social, economic, and environmental outcomes for Greater Manchester.

3.5. Flexibility in Operational Decision Making

Flexibility plays a key role in our operational decision-making process. Where historically the majority of consumer demands within the distribution network were not controllable and there was little to no generation connected at a distribution level, it is now possible to signal to demand and generation resources within the network to influence consumer behaviours. As a network operator, we also are increasingly able to utilise remotely operated network assets to modify the network topology in such a way as to influence the power flows in real-time. Increased use of monitoring and control technologies allows us to increase the potential number of connected distributed energy resources (DERs) to the network, increase the utilisation factors on existing network assets, and increase security of supply, whilst minimising the amount of network reinforcement that historically would have been required to facilitate these improvements.

The benefits of the use of flexibility for the network, our customers, and the environment are summarised below:

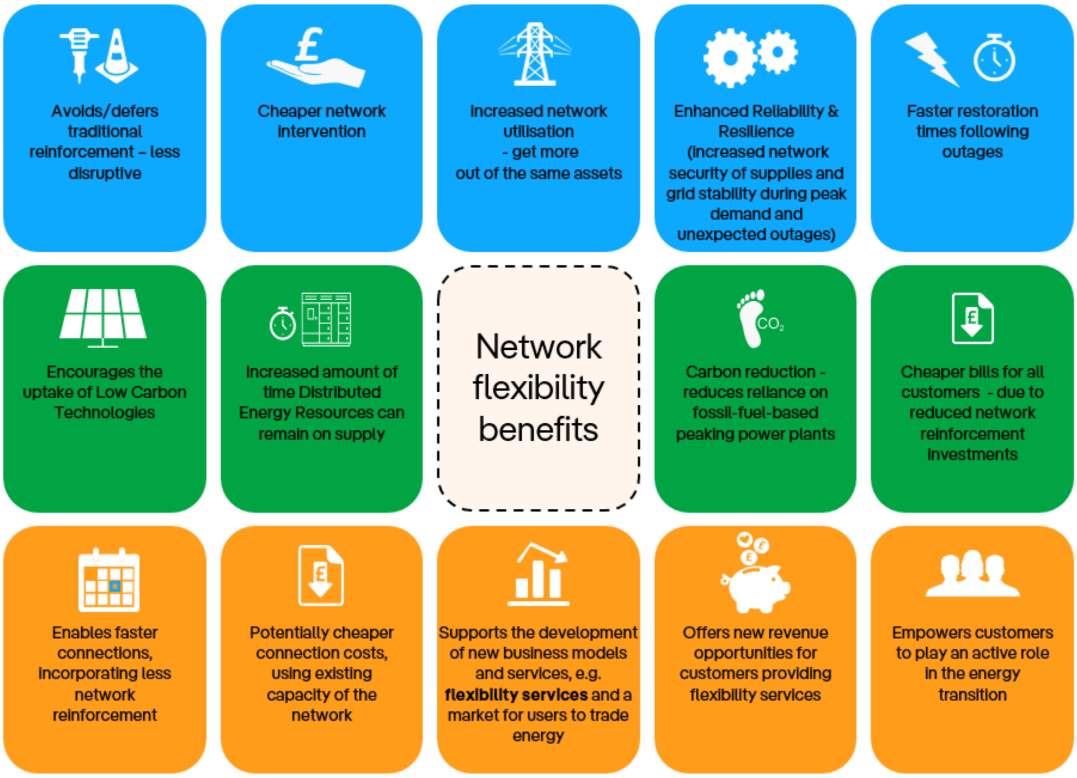


Figure 3-2 - Benefits of the use of Network Flexibility

3.5.1. Our Commitment to "Flexibility First"

Our ongoing commitment is to use flexibility as our first response - where it is the most efficient whole life cost solution - to resolving network constraints, unlocking capacity, improving network security, and supporting the transition to a net zero future. This means we promote flexible opportunities to the market first, as an alternative to traditional network capacity reinforcement and seek to deploy at all opportunities where it is robust and economic to do so. Where flexibility cannot be used, there may still be a need to use traditional asset-based reinforcement solutions, but even in these instances, we will still seek to innovate to develop the most efficient solution.

Our 'Flexibility First' commitment covers the three types of flexibility: Flexible Connections, Flexibility Services and Flexible Assets. (For a detailed description of each of these flexibility types, see Section 3.6)

3.5.2. How we will deliver on our "Flexibility First" commitment

Flexible Connections: We have supported the development of the changes to the connection charging methodology that have been 1made through the Significant Code Review (SCR) modifications that became live in April 2023. These reforms aim to reduce the barriers to connections caused by network reinforcement costs and provide assurances to connectees who sign up to temporary flexible connection agreements.

We are also supporting the implementation of Transmission Technical Limits (see Sections 3.6.1.1 and 4.6 for more details) that have been developed to accelerate the delivery of projects which would have otherwise been held in reinforcement queues waiting for reinforcement to the GB transmission network to be completed.

Flexibility Services: To develop the flexibility market, we will need to encourage three key types of participants:

- Customers to adopt Low Carbon Technologies (LCTs) and be more flexible in the way they use electricity
- Third parties, like aggregators, to encourage new entrants into the market to provide their flexibility
- Platform providers to seamlessly link buyers and sellers either directly or indirectly.

To ensure the continuous development of the flexibility services market in the North West region, we have created a clear and robust process that provides the necessary information in an easy-to- read format for these three key participant groupings to understand how to engage with and the value of engaging in the flexibility services market. Figure 3-3 lays out the end-to-end process, including the oversight and review processes (see Section 6), to provide confidence that we truly act as a neutral market facilitator and we manage any potential conflicts of interest openly and transparently.

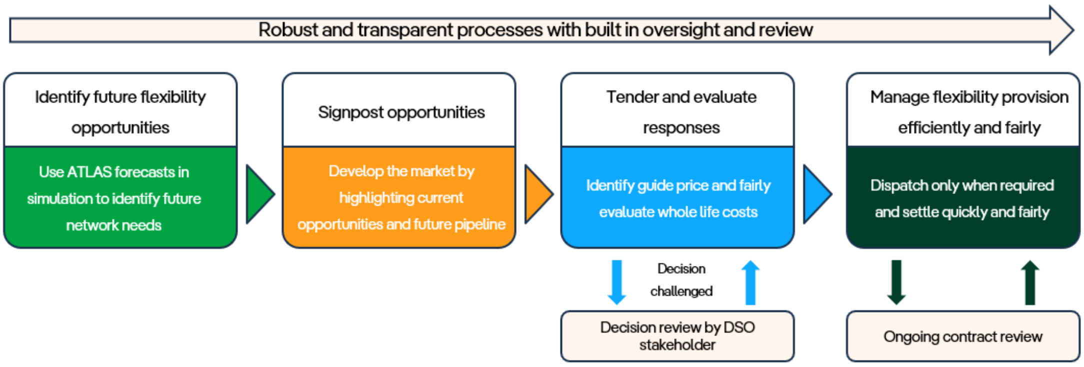


Figure 3-3 - Robust and transparent processes for delivering Flexibility First

Flexible Assets: We are continuously investing in the development of network control and automation systems, digitisation of our assets, and we are expanding their utilisation across our network where possible. This means faster, reliable, and consistent decision making required to fulfil our commitments.

3.5.3. When we use Flexibility

In RIIO-ED1, we procured Flexibility Services to mitigate or defer the need for general reinforcement on the grid and primary networks. In RIIO-ED2, we have developed and embedded new processes and procedures for using Flexibility Services in different network use cases which we apply across all voltage levels, particularly targeting the HV and LV networks where constraints will appear due to the expected increased penetration of electric heating and transport.

We seek to utilise flexibility in four main use cases in our network operation/development (shown in Table 3-2), and it will likely be combined with network monitoring and automation.

Table 3-2 - Four main use cases where we utilise Flexibility

Mitigate/defer load-related reinforcements	We carry out analysis of demand and generation forecasts to establish network capacity needs and subsequent reinforcement requirements. Where constraints are identified, mitigation options are based on the constraint's location, magnitude (peak load) and timing dependencies. We can utilise flexibility to manage seasonal peak demands based on our long-term or short/medium-term forecasts. This could also include planned energy efficiency measures that would reduce the site's demand across the year, long-term.
Manage uncertainty	There is often a level of uncertainty in our future load growth forecasts and associated need for intervention. We use flexibility as an interim solution to defer any need for immediate strategic investment whilst waiting for greater certainty on the likely network demand in the future. Flexibility can also provide an interim solution if there are long lead times for strategic investment.
Manage planned/ unplanned network events	<u>Post-fault:</u> We use flexibility to help restore network supplies following an unplanned outage/fault (e.g., storm events) Flexibility enables us to avoid the use of carbon-intensive mobile generation following network interruptions. Flexibility solutions can help us restore the network during a fault where customers remain energised, but the load is greater that the ratings of our assets (overloading). <u>Pre-fault:</u> We utilise flexibility services to manage: • Short-term demand peaks caused by exceptional unplanned events or forecastable events which are difficult to pre-schedule (e.g. extreme weather, sporting events, major televised events). • Under-delivery from another FSP. • Network load flows during planned outages (e.g., asset maintenance or construction outages) to ensure the network will continue to operate within safe and secure limits, especially when a fault is likely to occur at the same time.
Release capacity and enable connections	Where network capacity cannot accommodate new asset connections, we offer customers the option of flexible ("non-firm" or "curtailable") connection rather than a firm connection, to benefit from avoiding high reinforcement costs and associated timescales. We will only reduce (curtail) the customer's network import/export limit during certain periods of network constraints. Flexible connections can be used either as a long-term or as an interim solution until reinforcement is completed, enabling quicker and/or cheaper connections.

It is not always possible to utilise flexibility options to mitigate the need for asset interventions in the following constraint categories:

- Fault level constraint
- Power quality (voltage, harmonics, flicker) issue
- Protection
- Voltage step change

3.6. Types of Flexibility Explained

Our operational decision-making framework centres around the ability to utilise a range of flexibility options. There are three types of Flexibility which SP Electricity North West utilises: Flexible Connections, Flexibility Services, and Flexible Assets.

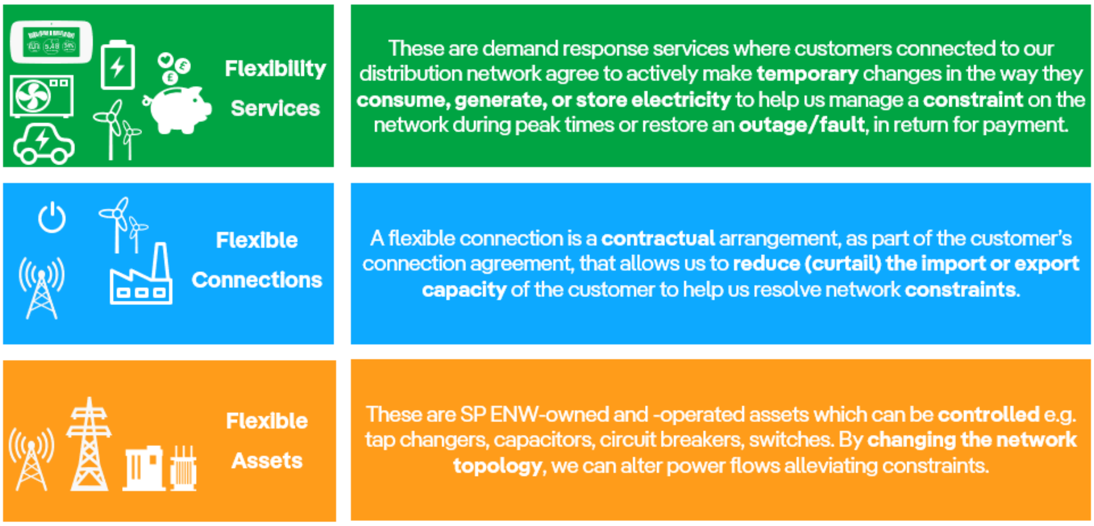


Figure 3-4 - Overview of the flexibility types we use

3.6.1. Flexible Connections

What are flexible Connections?

SP Electricity North West offers customers the ability to connect to the distribution network utilising a flexible connection arrangement. These types of connections are predominantly utilised where it has been identified that network reinforcement would be required to provide a customer with an unconstrained flow of import and/or export power. Contractual arrangements are established as part of the customer's connection agreement that allow SP Electricity North West to signal a curtailment of demand or generation to resolve network constraints. The benefits of accepting a flexible connection include reduced time to connect to the network, and/or reduced financial costs of connecting to the network.

In some scenarios, the limitations of these flexible connections are pre-defined within the customer's connection agreement, and they are responsible for self-managing within a defined operating regime that would prevent them from causing constraints within the network.

Within the RIIO-ED1 (2015-2023) period we predominantly utilised flexible connections to manage the export of power from sites with generation equipment. It is now also becoming common practice to utilise flexible connections which have demand import restrictions to avoid network constraints at certain periods of the year and during certain abnormal network running arrangements.

Customers have the option to utilise a flexible connection:

- Until the required network reinforcement has occurred or the constraint can be managed via alternative methods e.g. utilising Flexibility Services; or
- For the lifetime of the connection.

Currently, SP Electricity North West offers the following five types of flexible connections to its customers:

Curtailable	System Normal	Export Limiting	Import Limiting	Timed
A connection which can be disconnected or constrained when there are network overloads or restrictions affecting the network supplying the customer whilst the network is operating in an intact, system normal state.	A system normal connection can be disconnected or constrained when there is an abnormal network operating condition affecting the network supplying the customer e.g. circuits, switchgear etc.	A connection where the installed generation equipment has a greater export capability than that which has been agreed to be exported onto the SP Electricity North West distribution system. It is the responsibility of the customer to limit their export (EREC G100)	A connection where the installed equipment has a greater import capability than that which has been agreed to be imported from the SP Electricity North West distribution system. It is the responsibility of the customer to limit their import (EREC G100)	A connection arrangement where connection capacity is subject to restrictions within specific time periods. It is the responsibility of the customer to limit their import/export during these periods.

Figure 3-5 - Types of Flexible Connections offered by SP Electricity North West

3.6.1.1. Sites with "Technical Limits" (Part 4 Connections)

Current arrangements

As part of the accelerated connections program in collaboration with the National Energy System Operator (NESO), the industry is looking to identify and address the main challenges currently facing our connection customers and speed up connections. One of the main barriers to connections to the distribution network is the dependency on transmission system reinforcement. Conventionally, customers could not be connected until transmission network reinforcements had been completed. Distributed Energy Resources (DER) customers wishing to connect to the distribution network at a Grid Supply Point (GSP) (i.e. the boundary between transmission and distribution networks) which cannot connect until transmission network works are completed, are currently categorised by the NESO as Part 4 customers.

The industry is addressing this by establishing 'Technical Limits' at GSPs.

What are Technical Limits?

Technical Limits (TLs) are operational limits agreed between the DNO, TO and NESO at each GSP, to allow the DNO to manage the power flows at the GSPs and connect qualifying Part 4 distribution customers at these GSPs ahead of transmission reinforcement works, on a flexible basis. That means that the connection would be non-firm and uncompensated in case of a curtailment. It is noted that qualifying Part 4 customers can opt in to connect under this connection arrangement as a choice, and is not mandatory.

Expressed in Real Power (MW) value, Technical Limits represent the minimum and maximum acceptable power flow at each GSP beyond which wider Transmission system constraints could be active. TLs are calculated by the NESO, considering all existing Appendix G Part 1 and Part 2 DER and deducting the GSP minimum demand to identify net power flows on the wider Transmission system.

Those limits may vary depending on month/time of day, for example summer minimum and winter peak.

Technical limits will apply even under System-intact conditions. If the limit is breached during system normal conditions (N-0), the DNO will be required to take appropriate action to curtail Part 4 Distributed Energy Resources (DERs) as necessary.

Implementation of Technical Limits

Technical Limits are set through an industry-agreed methodology that can be applied across GSPs and are then controlled by the respective DNO using an Active Network Management (ANM) solution.

- We will begin to commission Technical Limits as part of the Active Network Management (ANM) commissioning.
- Ahead of commissioning of the Technical Limits, we will work with the NESO and National Grid Electricity Transmission (NGET) to ensure that our ANM solution meets all their requirements.

What is Active Network Management (ANM)?

ANM is a system used by grid companies to manage network constraints by utilising flexible assets, services and connections. The ANM system continually monitors all the constraints in real time and dispatches flexibility services or varies the import and/or export of flexible connections associated with the constraint.

See more details about our ANM system in Section 4.2.1 Active Network Management

Inter-control room communications protocol (ICCP) is a digital link between SP Electricity North West and the NESO and provides 'control and visibility' between the two control rooms. The NESO has made control and visibility a requirement of TLs.

- We are in the process of establishing an ICCP link with the NESO.

Section 4.6 explains how the ANM system will manage connections with Technical Limits during a constraint.

3.6.1.2. Part 3 Connections

In addition, some customers willing to connect to the distribution network at GSP level may fall under the Part 3 Connections category. This includes Connections that are subject to interim restrictions (for example while NESO works take place) and where Site Specific requirements also apply.

We currently manage Part 3 connections via an inter-tripping scheme, rather than though the ANM system, in order to ensure we comply with the response time limits set by the National Energy System Operator (NESO).

When a constraint is identified within a zone (e.g. system overload or system fault), the inter-tripping functionality will automatically disconnect or curtail a Part 3 connected customer (generator or demand) from the network. More specifically, following the receipt of the signal from the transmission system at the GSP, a trip signal is sent to the generator’s circuit breaker to open. This is to relieve localised network overloads, maintain system stability, manage system voltages, and/ or ensure quick restoration of the transmission system.

We are working with the NESO and NGET to review additional opportunities in utilising ANM rather than inter- tripping schemes to facilitate the connection of sites that are subject to Part 3 restrictions.

3.6.2. Flexibility Services

What are Flexibility Services?

When the demand for electricity in an area is greater than the amount that we are capable of providing, we can procure Flexibility Services to manage constraints whilst ensuring our network remains resilient, reliable and meets customer's needs.

Many different factors can lead to network constraints including large televised events; electric heating in winter; and the uptake in Low Carbon Technologies (LCTs) such as electric vehicles, heat pumps and solar panels. Flexibility Services can also be used to manage planned outages or disruptive failures, as an alternative to reinforcing the network; which can be extremely costly, disruptive and time-consuming as we upgrade assets across our region causing road closures and supply interruptions.

These services can be provided by companies or individual customers who own assets in our region, such as: generators, consumers, or electricity storage connected to our network, that can adjust the amount of electricity they generate or consume when we ask them to, in return for financial payment. We're proud to include Energy Efficiency Measures as part of our tenders; Participants can bid for multiple years of service by installing energy-saving measures such as LED lighting, double-glazed windows, and switching to more energy-efficient appliances and heating systems to reduce their long-term energy use.

Participation within Flexibility Services markets is voluntary and prospective Flexibility Service Providers can opt to participate by entering one of our regular open tenders. To ensure that we can maintain continuity of supplies and deliver maximum efficiency for customers, there are commercial consequences associated with Flexibility Service Providers who underdeliver upon their contracted obligations.

Flexibility services are often a cheaper and faster way of balancing supply and demand on the network as they allow us to utilise our existing assets to make the most out of the capacity we already have, and the money we save on reinforcement is passed back to the customer through cheaper energy bills or invested in the network to further improve performance. By not having to install these large assets we can also help to reduce our carbon impact and support community groups and local businesses that are utilising LCTs to get involved within their local energy markets.

Customers with Flexible Connections can also provide Flexibility Services as long as the assets meet the minimum criteria for participation for the service they are bidding into.

Section 5.2.2 of this document describes in more detail our decision making process for qualifying the flexibility service providers for our network.

Currently we run our flexibility services tenders twice per year. Each invitation to tender that we publish on our website details the type of response (product) that is required within each specified location. Our four types of responses are: **Peak Reduction, Operational Utilisation, Scheduled Utilisation, and Operational Utilisation and Variable Availability**. These are industry standardised products developed through the ENA Open Networks Project in collaboration with all UK DNOs and the National Energy System Operator (NESO).

Details of each product can be found in the helpful guides section of our Document Library.

3.6.2.1. Historical Dispatch of Services

We provide quarterly updates of our historical dispatches via our Open Data Portal.

3.6.3. Flexible Assets

Solutions made up from distribution network assets are a tried and tested way to improve network performance, increasing network flexibility, and delivering efficient solutions to network constraints. SP Electricity North West have a range of asset-based solutions which are already in operation and continue to explore future opportunities to expand these existing solutions, as well as developing future asset-based solutions.

What are Flexible Assets?

Flexible assets are items of plant or equipment, owned and operated by SP Electricity North West, which can be controlled in order to modify the network topology. Some examples of the types of assets which can be utilised as flexible assets include tap changers, capacitors, reactors, circuit breakers, and switches. Historically these assets have been controlled either via a human operation carrying out tele-controlled switching or on-site switching actions. Whilst these assets remain available for human-controlled switching operations, SP Electricity North West is increasingly utilising network automation systems in order to speed up the decision making of control actions. These systems dramatically increase the speed of operation of these assets, allowing for a greater network optimisation and the capability to unlock greater network capacity whilst also improving network stability and security.

Post-Fault Network Restoration Systems

SP Electricity North West operate a number of systems which are responsible for automated post-fault network restoration of supplies. In the event of a network fault, the network protection systems are designed to trip circuit breakers and blow fuses to isolate the fault from the network, preventing the damage of equipment and risks to life and limb. Following the operation of these circuit breakers and fuses, areas of the network fed by the faulted section of network assets will become de-energised, often leaving customers off supply.

In response to that, SP Electricity North West has incorporated a number of network automated restoration systems across its region to help narrow down the fault location, and then restore customer supplies to as many customers as possible without re-energising the faulted asset(s). These systems operate utilising a range of network SCADA information to locate the most likely sections of the network where a fault may have occurred. We utilise tele-controllable assets to remotely re-arrange the network topology and restore as many supplies as possible; this reduces the search area for operational staff to find the faulted asset(s) and further improves the time taken to locate and fix the fault.

We have developed other network automation systems to be cognisant of these restoration systems and operate these predominantly in such a manner that the restoration of supplies will take precedence over other network automation systems e.g. Smart Street, CLASS, ANM. For example, the Active Network Management (ANM) system will generally be programmed so that it will not issue any commands to Flexible Assets, Flexibility Services, or Flexible Connections in an area that the automated restoration systems are working to restore supplies. This is because the restoration systems rely upon receiving stable network measurements to determine the likely location of the fault, and then determine the optimal restoration strategy. If another automation system were to modify the network topology or distributed energy resources demand profile, this may temporarily hamper the restoration efforts of these automated restoration systems. Once these systems have completed their restoration cycle, the ANM system will be utilised to manage any remaining network constraints.

As a result of the ANM, we will increase the Fault Location, Isolation, and Service Restoration (FLISR) setting to restore more demand and faster. FLISR is an automation system that will detect faults within the High Voltage network, and work to utilise tele-controllable network switches and circuit breakers to segregate a faulted asset to the smallest area it can; and then restore as many customers as it can all within 3 minutes.

Voltage Control Techniques

At SP Electricity North West, we have developed some innovative voltage control techniques which have been transitioned into Business as Usual (BaU) in our network operation.

a) Smart Street

Smart Street is a series of innovative voltage control techniques and technologies, developed by SP Electricity North West, to enable our networks and customers' appliances to perform more efficiently and make it easier for Low Carbon Technologies (LCTs) to connect to the electricity network in the future - all without impacting power quality.

As we become more reliant on electricity as our main source of power, our customers will use more and new LCTs such as EVs, heat pumps and solar PV panels. These technologies tend to occur in clusters which has a dramatic effect on the electricity network. While EVs and heat pumps could cause voltage to fall below statutory limits, PVs exporting electricity to the network will have the opposite effect. If voltage levels fall outside statutory limits, the way our customers' appliances perform will be affected.

How Smart Street works

Our Smart Street solution aims to stabilise voltage and avoid it falling outside of statutory limits by using technologies, such as new controllable switching devices and on-load tap changers on the HV/LV distribution transformers. These are installed on the LV network and are coordinated by a centralised control system which is installed on our Network Management System (NMS). The system will perform a load flow every 30 minutes on the network model, adjusted to account for any actual losses on the transformer and LV switching devices, and will modify the load curves to account for the actual demand values, rather than the calculated values.

We can then reduce supply voltage to customers to an optimum level, a technique known as "conservation voltage reduction", using on-load tap changing (OLTC) transformers. These transformers regulate the voltage along the feeder while maintaining statutory limits. This allows for the peak load to be reduced, hence also reducing the annual energy consumption. Overall, by optimising voltage across HV and LV networks, Smart Street delivers:

- Increased network capacity and reduced network losses
- Easier integration of low-carbon technologies
- Up to 40% reduction in reinforcement costs.
- Improved carbon efficiency
- Reduced overall energy consumption
- Lower bills for customers
- Improved power quality and extended lifespan of customer equipment.
- Shorter supply interruptions and better service to customers.

Smart Street currently operates independently of other automation systems such as ANM, CLASS, Post Fault Network Restoration Systems etc. However, as these systems are controlling the Higher Voltage levels, and on occasion LV connected Distributed Energy Resources (DERs), Smart Street will adjust the LV network assets to ensure that network voltages are maintained within statutory limits.

In addition to the "conservation voltage reduction" technique, Smart Street allows us to mesh/interconnect LV networks to balance load when there is a load imbalance between two feeders, while releasing network capacity at times of high demand. This is done automatically through an intelligent software within our NMS which runs load-flow calculations in 30-minute cycles and makes decisions to issue switching commands. We additionally retain the capability to manually operate Smart Street switching equipment, for example in case of planned maintenance works.

Smart Street demonstrates a step change in the coordination and operation of electricity networks in GB and is the first demonstration of a fully centralised LV network management and automation system. As of autumn 2025, Smart Street has been rolled out to 70% of the distribution substations across our network, targeting areas with a high LCT uptake and fuel poverty. There is an ongoing programme to identify new sites for monitoring to expand coverage and improve network visibility. SP ENW's plan is to target achieving monitoring of 100% of the LV network by combining network monitoring supplemented with smart meter data.

You can find more about our Smart Street project here.

b) CLASS

CLASS (Customer Load Active System Services) is an innovative, low cost and easily deployable solution which uses voltage control to provide active voltage management for demand response capabilities and network voltage regulation services to reduce electricity demand at peak times, without customers noticing a difference to their supply.

This system was developed by SP Electricity North West utilising Ofgem Innovation funding and subsequently has been rolled out into BAU across 260 primary substations across the region which serve nearly 2 million customers.

By implementing the voltage management functionality, the ground-breaking CLASS approach:

- Facilitates integration of low carbon technologies, such as wind and solar
- Avoids or defers costly and disruptive **network reinforcement**
- Reduces costs for customers
- Can be rolled out on a national level

We are also able to use our CLASS methodology to offer 'balancing services' to the National Energy System Operator (NESO), helping them to balance supply and demand for the whole of Great Britain and avoid the need for additional expensive sources of power. The revenues from CLASS are utilised to pay back the return on the investment that shareholders made in the rollout of CLASS to BAU, as well as providing funding to improve the network reliability and affordability for our customers.

Alongside the aforementioned benefits offered by CLASS nationally, the rollout of the CLASS controllers has allowed for greater High Voltage (HV) network visibility and improved controllability; both of which enable further network automation, such as Active Network Management, and Post Fault Restoration Systems.

Although CLASS was originally trialled to address both distribution and transmission constraints, its current application is focused on resolving transmission-level and national constraints.

To ensure transparency and maintain SP Energy Networks' role as a neutral market facilitator within its evolving roles as a Distribution System Operator (DSO), the commercial operation of CLASS has been structurally separated from other business functions. This separation mitigates any actual or perceived conflicts of interest with the flexibility services market.

A dedicated commercial team is responsible for the bidding of CLASS services into the Balancing Market. Then, the dispatch of these services is managed within SP Energy Networks' control systems and aligned with the National Energy System Operator's (NESO) balancing mechanism dispatch methodology. This governance framework ensures that CLASS operates in a fair, compliant, and market-neutral manner.

You can find more about our CLASS project here.

4. How we dispatch Flexibility Resources

4.1. ANM Dispatch Principles

SP Electricity North West will utilise a combination of automated and manual dispatch methodologies for the usage of flexible resources. The Active Network Management (ANM) system (described in detail in Section 4.2.1 below) will become the primary method for the dispatch of flexible resources (Flexible Assets, Flexible Connections, and Flexibility Services). The control room and operation staff will retain the ability to manually dispatch resources in the event that the ANM system is not operational, or during periods where there is a safety or security of supply need to discontinue automation.

What is Primacy?

Primacy rules establish a hierarchy among different types of network services or flexibility options. They determine who has priority between the DNO and the NESO over dispatch of a flexibility resource to manage a constraint on their network when there is a conflict (i.e. under which scenarios the flexibility needs of one network take precedence over the other), in a coordinated process.

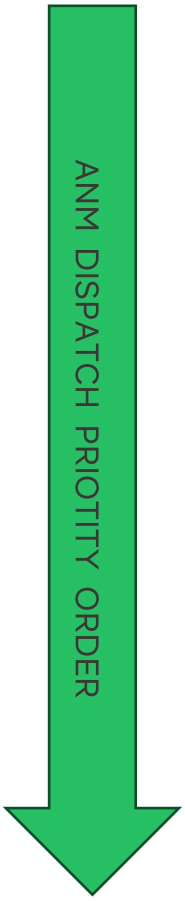
These rules should promote whole system efficiencies in a fair and transparent way.

See more details about Primacy rules and how we manage conflicts in Section 5.1.1

Currently, ANM is restricted to deploying LV and HV connected assets to resolve constraints which occur within the HV Network; similarly, only assets connected to the 33KV and 132KV network can be used to resolve constraints within the 33KV, 132KV, and Transmission network[1].

[1] The resolution of transmission constraints is limited to those listed within Part 3 & 4 of the appendix G.

Within the HV network, when a constraint occurs the ANM system will use its available options in the following order, whilst respecting Primacy rules:



1) **Flexible Assets** - The ANM system will utilise flexible assets to modify network topology to match existing network capacity with power flows. For example, if there is too much demand on a network feeder, the ANM system may opt to reconfigure where the normal network split point is located on the circuit to transfer excess demand to an alternative parallel feeder. Currently, this feature is restricted to the HV network and will be limited to being utilised where this does not cause operational safety risks E.g. high fault levels.

2) **Flexible Connections/ Services** - The ANM system will analyse which flexible connections and flexibility services contracts can be utilised to resolve the network constraint and will dispatch signals to them, in accordance with the Merit Order List ranking (see Section 4.5.3 below). The ANM system ensures customers are only curtailed/utilised in accordance with the terms in their Connection/ Flexibility Service Agreement.

3) **Non-flexible Connections** - Curtailing customers with non-curtailable connections will be our last resort to resolve a constraint and will only be utilised in the unlikely event that network re-configuration is inadequate to solve the constraint and there are no FSPs connected to the relevant constraint available and ready for dispatch.

To ensure a level playing field and a transparent approach to dispatching flexibility services, our ANM system is built on the following principles:

- Technology-agnostic: We support equally all types of flexibility services - including generation, energy storage, electric vehicles (EVs), and demand response - as long as the asset meets the technical requirements for managing network constraints.

- Equal Treatment of FSPs: All flexibility providers are treated equally, whether they are contracted directly with us, or engaged via an aggregator.

4.2. Systems and Operations

Our flexibility resources scheduling and dispatch infrastructure is based on three systems which work in tandem for seamless real-time operation: ANM, MOM, and ElectronConnect.

4.2.1. Active Network Management

In RIIO-ED1 (2015-2023) we implemented a new Network Management System (NMS) produced by Schneider Electric and with their assistance have developed and delivered a new Active Network Management (ANM) system.

Our ANM system went live in January 2025

Our ANM system continually monitors network limits in real-time and, in the event of network issues/constraints, it instigates some network control response. The ANM system can issue instructions to DERs (e.g. generators, energy storage systems, and controllable loads, etc.) connected to the constraints to alter their operation.

The network is divided into different ANM zones, and the ANM system ensures each zone stays within operational ratings. An ANM zone is made up of all electrically connected items within the distributed network which fall under the control of an ANM zone. For example, for 11kV an ANM zone is generally made up of a single primary substation.

Our ANM system has been built to directly integrate with our NMS so it holds real-time data for the network topology, running arrangements, metering data and other system monitoring devices. The NMS system also is the platform that the majority of our other network automation systems are built upon or interface with; therefore, this also allows for the coordination of operational decisions that these systems undertake.

Our ANM system is made up of two core components:

- The system which carries out **network modelling and operation** activities in real-time to manage network constraints utilising flexible network assets, flexible connections, and flexibility services.
- The **Merit Order Management (MOM)** system, which sets out the order in which resources are to be dispatched when a network constraint has been detected.

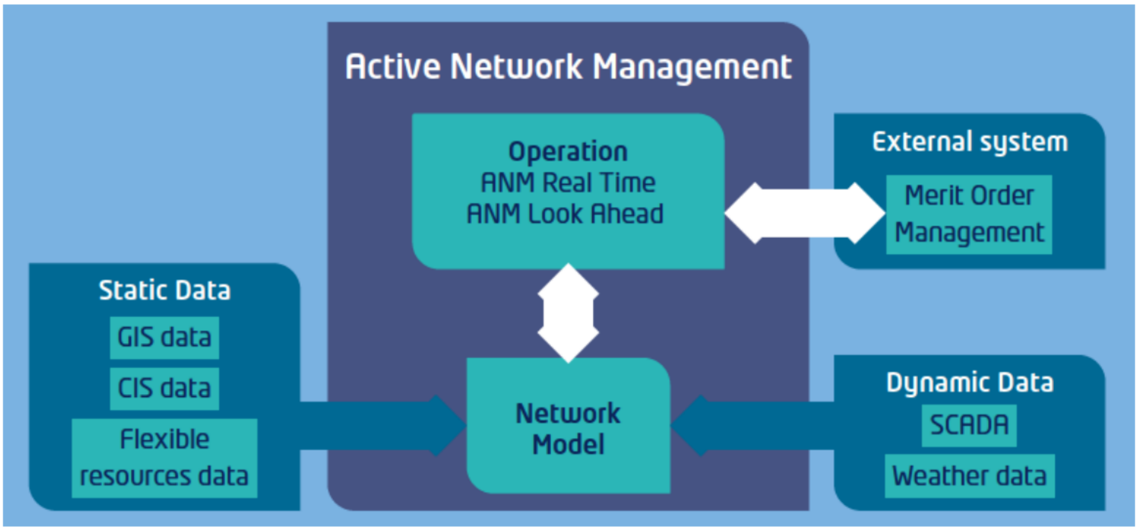


Figure 4-1 - ANM system architecture

4.2.1.1. Why our ANM Leads the Industry

Our ANM system is industry-leading because it combines efficiency, scalability, robustness, and fairness in a way that no other DNO solution does.

- ✓ By centralising ANM and NMS into a single real-time topology, it delivers unparalleled operational efficiency, better control and lower risk of data loss.
- ✓ Unlike traditional tactical approaches tied to individual GSPs, our platform enables mass scaling within days, making it highly adaptable to future network needs.
- ✓ Automation of all actions and commissioning ensures reliability and reduces human error, while optimisation strategies release additional capacity at zero cost to customers before utilising flexibility services/flexible connections—minimising unnecessary dispatch/curtailment.
- ✓ Furthermore, our dynamic Curtailment Index (described in Section 4.3) guarantees curtailment is distributed more equally across all customers, and the pseudo-pricing mechanism (described in Section 4.5.1) ensures unbiased, commercially optimal deployment of both flexibility services and flexible connections.

This holistic approach sets a new benchmark for cost-effectiveness, transparency, and operational excellence in the industry.

4.2.2. Merit Order Management

The Merit Order Management (MOM) system is standalone system that holds contractual data for all flexible connections and flexibility services and generates the *merit order* (or curtailment list) for all potential constraints within a defined ANM zone. The merit order is a pre-defined stack of Flexible Connections and Services that defines the order in which flexible resources are to be dispatched/curtailed when a network constraint has been detected. The ANM system utilises the MOM list to send dispatch signals to request a change in the site's import or export.

Figure 4-2 shows a curtailment stack/merit order list, where network users are stacked in order of likely curtailment i.e. those at the top of the stack face greater probability of curtailment or likelihood of getting dispatched for flexibility services.

All assets connected to SP Electricity North West's network that have a Flexible Connection Agreement or a Flexibility Services Agreement, where they can be dispatched in operational timescales, are registered in the master merit order and can be called upon to solve a constraint.

At SP Electricity North West, the master merit order is common for the entire system as opposed to a merit order list per constraint. When a constraint occurs, the ANM system uses and filters the Merit order list to send dispatch instructions only to those assets which can alleviate the constraint, by requesting a change in the site's import or export.

Curtailable Distributed Energy Resources (DER) customers are always at the top of the list and non-curtailable customers are at the bottom.

We have strategically developed our MOM system as a standalone system, outside the core NMS and ANM infrastructure, under the management of the DSO commercial team. This allows interface with other systems or platforms whilst maintaining a clear separation between DSO commercial decision-making and traditional DNO activities.

The merit order is determined using our unique Curtailment Index approach, described in detail in section 4.3 below.

4.3. Curtailment Index

The master merit order is constructed based on Curtailment Index of each connected DER, to determine the order for asset curtailment when a constraint occurs. A Curtailment Index is presented as the ratio of the total curtailment already experienced within the year compared to the estimated maximum curtailment allowance for the year. Customers with flexible connections are assigned a forecasted Curtailment Index value, and a maximum cap value of curtailment they should expect to see during the course of a year and on a 6-year rolling average. These are based the voltage level where the asset is connected and the security of supply, i.e. how often an asset is likely to be curtailed, which are agreed within the Connection Agreement.

$$\text{Curtailment Index} = \frac{\text{Actual curtailment throughout the year so far (MWh)}}{\text{Curtailment allowance for the year (MWh)}}$$

An "Adjusted Curtailment Index" is used to determine the merit order, which shows the percentage (%) of remaining curtailment *allowance* and is measured as:

$$\text{Adjusted Curtailment Index} = \frac{\text{Curtailment allowance for the year (MWh) - Actual curtailment throughout the year so far (MWh)}}{\text{Curtailment allowance for the year (MWh)}}$$

- The Curtailment Index methodology means that every time a DER is curtailed, its Curtailment Index value is recalculated.
- Whichever DER has the highest amount of remaining curtailment allowance (proportional to the level of contractual allowance at the start of the year) is at the top of the stack and more likely to be curtailed.

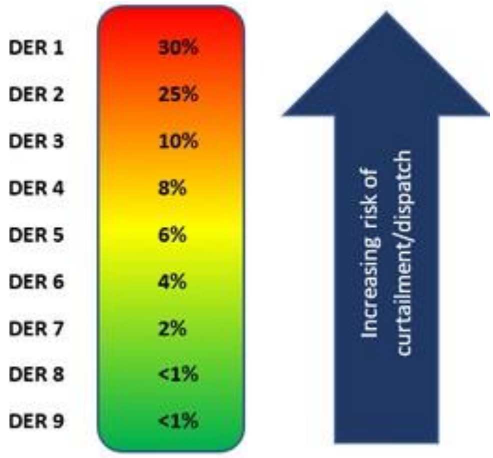


Figure 4-2 - Curtailment stack/ merit order list using the Adjusted Curtailment Index

The Curtailment Index approach for determining curtailment of Flexible Connections to manage congestion on the distribution system is considered fairer and more transparent that the alternatives of *LIFO (Last In-First Out)* or *Pro-rata* approaches commonly used in the UK.

Table 4-1 - Comparison of flexibility dispatch methodologies with other DNOs

	Curtailment Index	LIFO	Pro-rata
How order of curtailment is defined	The order of curtailment for each curtailable DER is defined in the merit order list based on its *current level of curtailment*; this ensures shared utilisation of flexibility resources across the network.	The DER which was the chronologically last to connect to the network would *always* be the first to be curtailed in the event of a network constraint.	Each DER will be curtailed by the same percentage.
Static vs dynamic curtailment order	Curtailment index is *dynamic*; every time a DER is curtailed, the curtailment index value is recalculated.	The DER's order within the curtailment list is *static*; it only changes (improves) when new flexible connections are added.	The DER's order within the curtailment list is *static, i.e.* all DERs connected to the constraint will be curtailed.
Transparency in curtailment	Ensures fairness through *equal use of assets* connected via flexible connection arrangements over a period of a year, in accordance with their contractual agreements. Customers are not negatively impacted by being the last to connect.	DERs with later application date face *disproportionally greater risk of curtailment* compared to other DERs with earlier application date.	Curtailment in an impacted ANM zone is shared equally *across all generators* exporting during the constraint. Larger DERs will likely be impacted more.

Our curtailment methodology was consulted upon in our DSO 2021 strategy, where our stakeholders were unanimous in their support of the use of the Curtailment Index approach over other curtailment methodologies.

4.4. Third Party Flexibility Platform (ElectronConnect)

ElectronConnect is our core flexibility market platform offering an end-to-end solution for FSPs to participate in our flexibility market, from registration and qualification all the way through to dispatch and settlement. ElectronConnect contains details of our flexibility services contracts and facilitates dispatch of flexibility services via Application Programming Interface (API).

Under the ENA Open Networks Project GB Dispatch Interoperability Technical Working Group, all UK DNOs, the NESO and Elexon are currently working together to develop a standard API for sending dispatch instruction to FSPs in Great Britain in a standard interoperable format. This API standard will be embedded within ElectronConnect once developed, supporting real-time response monitoring, and response validation.

Benefits of having a Standard API include:

- ✓ Interoperability: One consistent dispatch process across all network operators.
- ✓ Efficiency: Reduces the need for multiple interfaces to offer their services across Great Britain.
- ✓ Cost & Time Savings: Simpler, cheaper and faster integration for FSPs, encouraging broader participation.
- ✓ Market Access: Lowers barriers to participation in multiple markets for new and existing FSPs.

4.5. Our Dispatch Methodology

4.5.1. Seamlessly Merging Flexible Connections & Flexibility Services

To allow for the unbiased deployment of flexibility solutions, our MOM system includes all procured dispatchable Flexibility Services and Flexible Connections into a unified merit order list.

In order to be able to equally compare Flexible Connections (which are uncompensated when they are curtailed) and Flexibility Services (which receive payment when they are dispatched) that coexist within the same Merit Order list and rank them in the optimal commercial order for dispatch, we have incorporated ***pseudo pricing*** into our Curtailment Index methodology.

How pseudo pricing works:

Our MOM system assigns a *Pseudo Curtailment Price* (in £/MWh) to the Curtailment Index of Flexible Connections; this enables the comparison of Flexible Connections to the cost of utilising a Flexibility Service, which is also measured in £/MWh based on their bidding price. The commercial value of curtailment can be configured in the MOM system providing a transparent way to fairly evaluate all Flexibility Resources available to resolve a constraint.

$$\text{Pseudo Curtailment Price (£/MWh)} = \frac{1}{\text{Adjusted Curtailment Index}} \times \text{Value of Curtailment (£/MWh)}$$

e.g. where Adjusted Curtailment Index = 5 and Value of Curtailment = £1.40/MWh

→ Pseudo Curtailment Price = $\frac{1}{5}$ × £1.40 = £0.28/MWh

Benefits of our innovative pseudo pricing methodology include:

- Flexible Connections participants benefit from appropriate caps on curtailment that safeguard their interests.
- FSPs are provided with assurance that the utilisation of curtailable connections wouldn't diminish the value stack for Flexibility Services, providing more certainty on revenues.

A network user's order within the curtailment list is ultimately based on their current Pseudo Curtailment Price when compared with each connected network user behind the constraint. The asset's Pseudo Curtailment Price is adjusted dynamically as its Curtailment Index changes to reflect any network event or activity that caused the DER to adjust its import or export.

For each potential constraint identified within an ANM zone by the ANM system, the ANM system will filter the stack provided by the MOM system into lists which are relevant to that specific constraint. This means that if there are multiple constraints within an ANM zone, network users may appear in multiple stacks or lists. For the utilisation of resources within the Merit order stack, the MOM system will re-evaluate all flexible resources across the lists to ensure that **the site with the lowest price is at the top of the merit order list**.

4.5.2. Forecasting and Managing Constraints

Flexibility services are often procured in advance to secure against a specific level of perceived network constraints. Our ANM will facilitate short-term forecasting, providing a more up to date and accurate view of when a DER will be utilised, allowing users to participate in a lot more revenue streams in the future, even a day or hours in advance should the need arise.

The forecasting application built into our ANM runs simulations for up to 48 hours in advance and will highlight potential scenarios which may result in the ANM system needing to dispatch flexible resources. The forecasting functionality incorporates historical demand trends, weather forecasts, planned outages, maintenance periods and pre-scheduled flexibility services.

The ANM system utilises all resources (Flexible Connections and Services) which are available to it to resolve network constraints in the sequential order of the merit order list. The merit order categorises the assets based on the network status, as illustrated in Table 4-2**Error! Reference source not found.**. For example, if an N-2 fault occurred, the ANM system would first dispatch all the Category 1 assets, and then the Category 2 assets prior to dispatching the Category 3 assets.

Note: In electricity networks, the "normal minus X" (N-X) criterion, also known as "N-X" secure, describes the principle that in the event of an unplanned loss of one or more power system components (e.g. transformer, overhead line, generator, etc.), the power system is capable of maintaining reliable power supply through redundancies and the total failure of a system is prevented.

In the "N-X" definition (where X = 1,2,3, etc.), X and represents the *number of components* within the same system that have experienced a planned outage (e.g. for maintenance) or fault co-incidentally.

Table 4-2 - Merit order categorisation

Category	Network status	Utilisation of Flexible resources within the merit order list
1	System Normal	• Unfirm and constrained connections for normal running arrangement (N-0) • Pre-fault flexibility services
2	System abnormal (N-1)	• N-1 Unfirm connections for any abnormal running conditions • Post Fault flexibility services for N-1
3	System abnormal (N-2)	• Firm connections for first abnormal running condition (N-2) • Post Fault flexibility services for N-2
4	System abnormal (N-3)	• Firm connections for second abnormal running condition (N-3) • Post Fault flexibility services for N-3

Dispatch Order

4.5.3. Process of Flexible Resources Dispatch/Curtailment Order

The actions taken at a curtailment event can broadly be split into three phases (based on timescales) after the registration of the different parties to the MOM:

1. Constraint forecast and run-up to curtailment/dispatch
2. During curtailment/dispatch
3. Post-curtailment/dispatch

Constraint forecast and run-up to curtailment/dispatch

Ahead of time, the ANM system creates a 'Look Ahead' report which provides a 48-hour forecast of likely future constraints in one-hour blocks. For each identified constraint, this includes a list of assets connected to that specific constraint. The 'Look Ahead' uses historical data and predictions based on inputs, such as weather data. The output includes a prediction of the magnitude of curtailment required. The "Look Ahead" report is sent to the MOM system and is used by the DSO team to make commercial decisions on whether more flexibility services should be utilised, or if other operational practices should be considered.

Additionally, the ANM system also holds the master merit order of connected customers (created by MOM) and the threshold up to which they can be curtailed or where flexible services contracts exist.

The “Look Ahead” and merit order are updated every hour on a rolling basis.

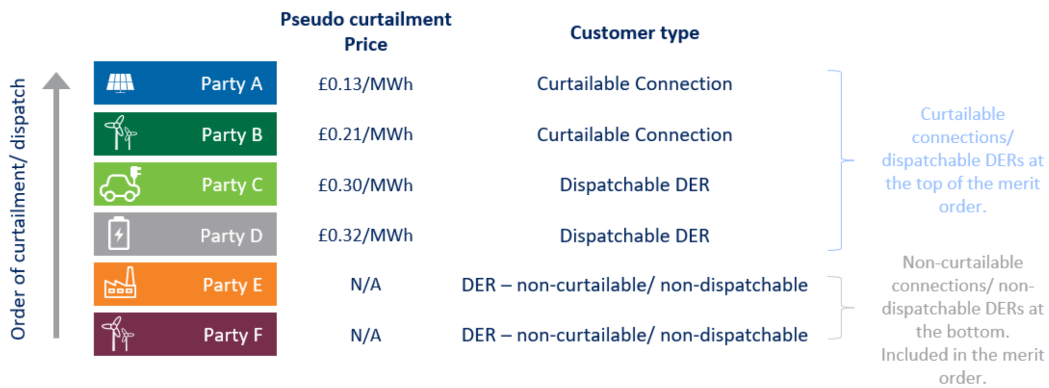


Figure 4-3 - Example of a merit order produced from the “Look Ahead” and “Engagement List”.

During curtailment/dispatch

If the ANM system detects a network issue which requires action to manage a constraint, it starts to work through MOM’s latest merit order list, which it filters as necessary for the specific constraint, and is checking against any Primacy rules[2]. In this example, the process starts with Party A. The ANM system sends a signal to Party A to reduce output, with Party A then expected to action this. If an instruction does not elicit a response (or an adequate response) the ANM system continues to work down the merit order issuing instructions until the required level of response needed to alleviate the constraint is delivered.

The ANM system:

- Sends dispatch requests to Flexibility Services via the Services Dispatch platform, which will then dispatch these resources and monitor the response to carry out settlement activities.
- Will curtail/disconnect any flexible connections via a Remote Telemetry Unit (RTU).

[2] *Following Primacy rules, DER(s) may be disqualified from being dispatched on the basis of a NESO service taking precedence.*

	MEC	Pseudo curtailment Price	Post curtailment/ dispatch	Customer type
~~Party A~~	1MW	£0.13/MWh	0MW	Curtailable Connection
~~Party B~~	3MW	£0.21/MWh	1MW	Curtailable Connection
Party C	1MW	£0.30/MWh	1MW	Dispatchable DER
Party D	2MW	£0.32/MWh	2MW	Dispatchable DER
Party E	2MW	N/A	2MW	DER – non-curtailable/ non-dispatchable
Party F	3MW	N/A	3MW	DER – non-curtailable/ non-dispatchable

Figure 4-4 - Merit order during curtailment

Post-curtailment/dispatch

The ANM system creates an "Engagement list" which holds the data of which Flexible resources (connections, and Services) it has dispatched/curtailed and sends it to MOM to update the curtailment/merit order list.

Once a curtailment/dispatch event has occurred, the adjusted Curtailment Indices and respective pseudo-curtailment prices of the curtailed/dispatched parties are updated to reflect this (see Figure 4-5). This may mean that the merit order changes for the next constraint event.

Order of curtailment/ dispatch

	Pseudo curtailment Price	Customer type
Party A	£0.17/MWh	Curtailable Connection
Party C	£0.30/MWh	Dispatchable DER
Party B	£0.31/MWh	Curtailable Connection
Party D	£0.32/MWh	Dispatchable DER
Party E	N/A	DER – non-curtailable/ non-dispatchable
Party F	N/A	DER – non-curtailable/ non-dispatchable

Figure 4-5 - Merit order post- curtailment

The data flows before, during and after curtailment/flexibility services dispatch are shown in Figure 4-6.

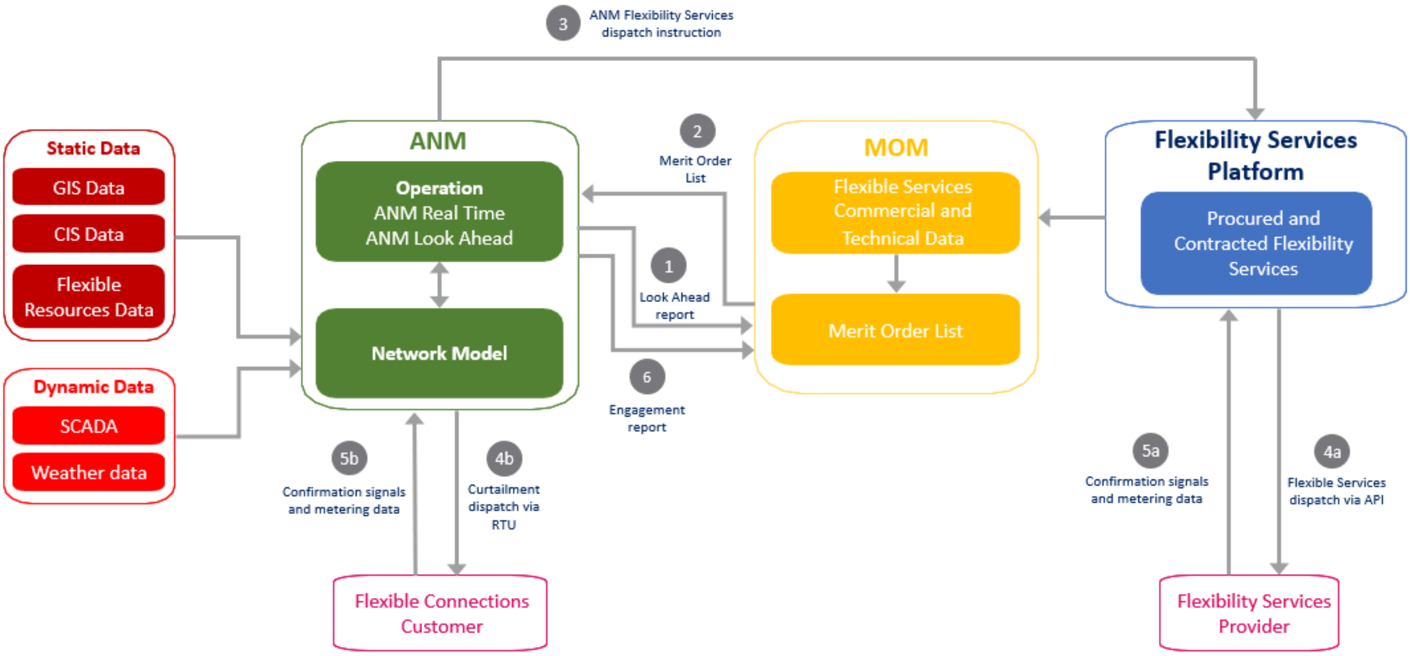


Figure 4-6 - Process and Commercial and Technical Data flows for Flexible Resources Dispatch

4.6. Managing Technical Limits

DERs which have been identified as Sites with “Technical Limits” (Part 4 Connections) will be entered into the ANM system, for Transmission constraints only, in a Curtailment Index stack order. The Curtailment Index stack will be calculated separately to the stack used to manage the constraints which are within the distribution network.

- In the event that the “Technical Limit” is going to be breached, Part 4 Connections will be constrained *ahead* of all other DNO negotiated Flexible Connections and Services.
- If the limit breach is not associated with a “Technical Limit” point on the network, then the standard SP Electricity North West Merit Order list will be utilised instead.

The NESO mandates that the DNO has to manage the Part 4 DER to prevent TL breaches. However, should the TL be breached, the DNO would curtail or disconnect the relevant DER.

Should a Part 4 DER fail to respond to a signal from us requiring the customer to curtail its output, this may result in us having commercial discussions about the customers ongoing connection rights under TLs.

As such DNOs will need to set curtailment limits in a manner that will allow for the pre-curtailment of DERs ahead of a breach of the Technical Limit.

4.6.1. Curtailment Methodology for Part 4 Connections

Following extensive stakeholder engagement, SP ENW has adopted the Last In First Out (LIFO) Methodology for the curtailment of Part 4 Connections, This decision was informed by two rounds of consultation held in February 2025 and October 2025, which aimed to establish a fair and transparent approach to managing network constraints at Grid Supply Points (GSPs), where stakeholder responses indicated a clear preference for the LIFO methodology.

The consultation sought views on three proposed curtailment methodologies for Part 4 Connections:

- Curtailment Index (CI)
- Last In First Out (LIFO)
- Curtailment Index Batching (CIB)

More details and examples for each curtailment option are provided in the webinar slides and recording.

SP ENW's decision to adopt the LIFO methodology is underpinned by the following benefits:

- ✓ Transparency: Curtailment order is clearly based on the DER's connection offer acceptance date.
- ✓ Rewards Early Acceptance: This approach incentivises early commitment by ensuring that DERs who accept their connection offer sooner are rewarded with lower curtailment exposure. Their position in the queue is preserved and not impacted by subsequent applicants.
- ✓ Static Curtailment Position: A DER's position in the curtailment queue remains fixed once the connection offer is accepted; it only changes (improves) when new Part 4 connections are added. New DERs joining later do not increase the curtailment risk of existing DERs.
- ✓ Predictability: DERs can forecast curtailment risk more accurately, supporting operational and investment decisions.
- ✓ Simplicity: The methodology is straightforward to implement and understand.
- ✓ Fairness: Earlier DERs are protected from increased curtailment caused by later connections.
- ✓ Stakeholder-aligned: LIFO was the preferred option among respondents to the consultation.

How the LIFO curtailment methodology works

With the LIFO methodology, a Part 4 constraint at a GSP is resolved by curtailing Part 4 DERs in reverse order of their connection offer acceptance date.

Under LIFO, each DER is assigned a position within a curtailment stack based on when they accepted their connection offer. When a new DER accepts a connection offer for the same GSP, they are placed at the top of the curtailment queue - meaning they will be curtailed first during a constraint event, and existing DERs will move one position lower in the stack.

In the example scenario below:

- DER A was the first to accept a connection offer and is placed at the bottom of the curtailment stack.
- DER D was the most recent to accept a connection offer and is placed at the top of the curtailment stack.

During a constraint event:

- DER D - being at the top of the curtailment stack - will be curtailed first.
- The curtailment process follows a strict order, meaning each DER is ***fully*** curtailed before the next lower-positioned DER in the stack is affected.
- DER A - being at the bottom of the curtailment stack - would ***always*** be the last one selected to be curtailed and would only be curtailed if the impact of fully curtailing all the DERs (DER D, DER C, DER B) further up on the curtailment stack did not resolve the Technical Limit breach.

The LIFO approach ensures that DERs already connected to a GSP are not impacted by the curtailment risk introduced by later applicants. It rewards early acceptance and provides greater certainty for operational and investment planning.

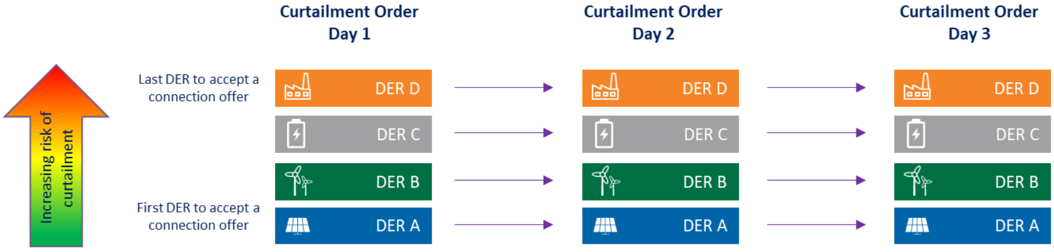


Figure 4-7 - How the LIFO curtailment methodology for Part 4 connections works

Sharing curtailment information with Part 4 Customers

Part 4 DERs will receive an estimated annual curtailment forecast prior to connection.

- Pre-connection: We provide a curtailment forecast indicating expected interruptions to support revenue modelling and informed investment decisions.
- Post-connection: We review actual curtailment annually and share this data with customers, using RTU monitoring and planned outage schedules.

4.7. ODM Use Cases

The table below defines some of the core use cases that SP Electricity North West follows with regards to ODM and the hierarchy of the decision-making processes and systems which are utilised and implemented:

Use Case	ODM System and Process	
Loss of customer supplies following a distribution network fault	Auto reclose schemes	Auto reclose schemes try to re-energise the network to see if the fault was transient in nature, where it has been deemed safe and beneficial to do so.
	Centralised automated post-fault restoration systems	These systems will re-arrange the network topology in order to restore power to as many customers as possible; whilst also reducing the search area for the faulted network asset(s).
	Tele-control & manual switching operations	Control room staff and field-based staff will work together to locate the faulted assets, isolate, and earth the network; and then affect a repair and restoration of supplies.
Management of Transmission Technical Limits	ANM	ANM will seek to curtail DERs that have a "Part 4" agreement in place in the event that a Technical Limit is likely to be breached.
Thermal (A, MW, MVAr, MVA), and voltage constraints on the 33kV, 132kV, and Transmission network	ANM	ANM system will analyse the level of constraint that has been experienced and then utilise Distributed Energy Resources from the Merit Order List that are connected at 33kV & 132kV in a sequential order to reduce the constraint to under the normal operating threshold.
	Tele-control & manual switching operation, Network reinforcement	Where ANM is not installed or has not succeeded to manage the 33kV, 132kV, and Transmission network within asset and statutory limits, a combination on network topology rearrangement and network reinforcement may be required to ensure that the network revert to being inside of asset and statutory limit thresholds. These solutions are often proactively managed ahead of an excursion from asset and statutory limits.
Thermal (A, MW, MVAr, MVA), and voltage constraints on the High Voltage network	ANM	ANM will seek to utilise Flexible Assets initially for constraints on the HV network, reconfiguring the network topology to alter load flows across the network. If the constraint remains unresolved the ANM system will analyse the level constraint that has been experienced and then utilising distributed energy resources (flexible connections & services) from the Merit Order List that are connected at LV or HV in a sequential order to reduce the constraint to under the normal operating threshold.
	Tele-control & manual switching operation, Network reinforcement	Where ANM is not installed or has not succeeded to manage the HV network within asset and statutory limits, a combination on network topology rearrangement and network reinforcement may be required to ensure that the network revert to being inside of asset and statutory limit thresholds. These solutions are often proactively managed ahead of an excursion from asset and statutory limits.
Low Voltage network voltage management	Smart Street	The centralised control system will telecontrol Low Voltage network assets to rearrange the network topology to maintain the voltage within statutory voltage limits.
	Tele-control & manual switching operation, Network reinforcement	Where Smart Street is not installed or has not succeeded to manage the low voltage network voltage within statutory limits, a combination on network topology rearrangement and network reinforcement may be required to ensure that the voltages revert to being inside of statutory limit thresholds. These solutions are often proactively managed ahead of an excursion from statutory limits.
Balancing Mechanism	CLASS	The CLASS system will respond to a NESO defined trigger. The system will either utilise transformer tap changers or circuit breakers at primary substations to affect a change in network demand to provide a balancing service to the NESO.

Figure 4-8 - Operational Decision-Making use cases

4.8. Sharing Dispatch and Curtailment Information

We publish the merit orders, created by the MOM system, by which we propose to dispatch flexible resources for each constraint. Initially, the merit order information will be available to all network users in the stack that are at risk of being curtailed. This will help users identify their curtailment risk in advance and evaluate the impact on other contractual obligations, e.g. provision of flexibility to the NESO.

To ensure transparency in our flexibility services dispatch process, we publish on the SP ENW Open Data Portal a summary of all dispatches within that month (including flexible unit, flexibility product, times, and amount dispatched), and this data is updated monthly. We report on our dispatch data via the SLC31E report annually, which is submitted to Ofgem and published on our website here.

We are also committed to sharing curtailment information with our customers having a flexible connection arrangement, whilst safeguarding their operations from excessive curtailment.

- Before connection, our curtailment forecast[3], indicating expected interruptions, curtailment index and demonstrating our commitment to our customers, is offered to all new flexible connection customers. In this way, we look to help customers complete revenue modelling and make more informed investment decisions.
- Post-connection, we review actual curtailment the site has experienced and share this information with customers annually. We gather data on the site's curtailment via a remote terminal unit (RTU) and planned outage schedules.

[3] The number of curtailment hours shall be calculated under system normal scenario only, using the proposed methodology in the Ofgem-approved Distribution Connection and Use of System Agreement (DCUSA) DPC404 – Access SCR: Changes to Terms of Connection for Curtailable Customers. Curtailment hours shall be the total number of hours where asset loading exceeds 90% of the asset short time rating.

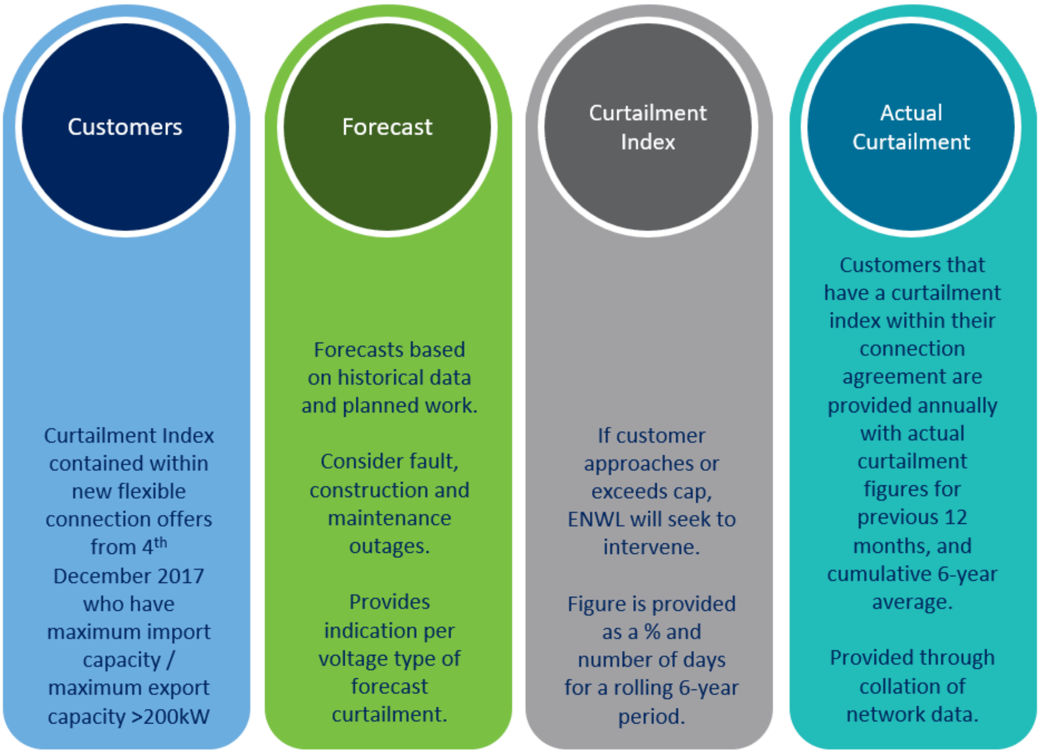


Figure 4-9 - How we share curtailment information with customers with flexible connections

4.9. Facilitating Secondary (Peer-to-Peer) Trading

BiTraDER is an innovation project, developed by SP Electricity North West and funded through Ofgem's Network Innovation Competition (NIC), that aims to give customers more choice in managing their capacity and Curtailment/dispatching obligations through the development of a peer-to-peer trading platform. BiTraDER will investigate, build and trial – live on our electricity network - new opportunities for customers connected to the same constraint to trade between themselves their position in the merit order stack, avoiding curtailment and generating additional revenue. More specifically, for those on a non-firm (curtailable) connection, it offers the option to trade their position in the curtailment order with another customer (subject to certain conditions and in line with pre-determined trading rules). This would allow businesses to stay connected for longer or avoid curtailment altogether when it's really needed for operational reasons. It would also allow customers with a firm (non-curtailable) connection to sell their 'spare' network capacity and take a position in the curtailment order, generating additional revenue.

The pilot scheme is a first in the UK to test bilateral trading on a live network setting.

- All assets able to resolve the constraint will be treated equally.
- Facilitating secondary trading means that customers will be able to trade both their risk of curtailment as well as any excess capacity they may have.
- Having the ability to trade should encourage greater participation in flexibility services, reduce barriers to the connection of low carbon generation on the

network, boost value for connected resources, and bring down whole system costs by adding value to the flexibility market.

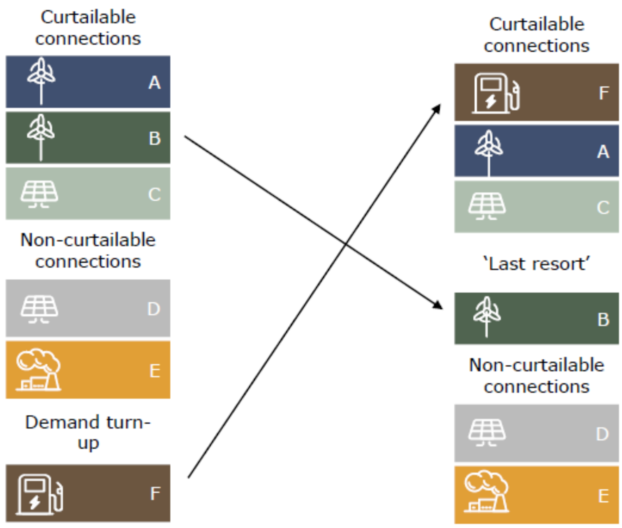


Figure 4-10 - Merit order trading principles using BiTraDER

The merit order trading principles are illustrated in Figure 4-10 with a potential constraint linked to excess generation. The original merit order list for curtailment is shown on the left. This has the curtailable connection sites (A, B and C) at the top. These are followed by the non-curtailable connection sites (D and E). A site capable of demand turn up (F) is also included, as this is an excess generation related constraint.

Party B wishes to reduce its risk to potential curtailment. Through peer-to-peer trading via the platform, Party B (the buyer) successfully trades with, and so secures reduced risk of curtailment from, Party F (the seller) i.e. B transfers its curtailment obligation to F.

The revised merit order following trade is shown on the right. As a consequence of trade, F moves to the top of the merit order, and B moves below all other curtailable connections, and above non-curtailable[4] connections.

It is noted that after successful curtailment order trading, the Curtailment Index of the buyer (Party B) is updated if the associated seller (Party F) is curtailed.

You can find more about our BiTraDER project here.

[4] These are non-curtailable connections under system normal conditions, i.e. they are planned and operated such that they should not be curtailed whilst the network is operating in an intact, system normal state; however, they may be curtailed in the event of the loss of any one or more elements (e.g., an overhead line route, a transformer, an underground cable)
It is noted that when these non-curtailable connections participate in BiTraDER they can be curtailed whilst the network is operating under system normal conditions.

5. Industry Coordination

We make sure that our operational decisions and solutions are coordinated from a whole energy system perspective. We continuously coordinate with other System and Network Operators (including other DNOs, TOs, and the NESO) to remove barriers for participation in the flexibility market, encourage market liquidity and avoid conflicts between services and products.

5.1. Conflict Management

5.1.1. Primacy

Under the ENA Open Networks Project Primacy Technical Working Group (replaced by the Market Facilitator (MF) Working Group, led by Elexon, since summer 2025), all UK DNOs and the NESO have worked together to identify use cases where risks of service conflicts between flexibility requirements in the distribution network and the national transmission system managed by the NESO that may exist. Hence, in order to manage these potential service conflicts and to enable networks to be optimised efficiently and transparently, the Primacy group has developed a common set of clear principles and "Primacy" rules.

"Primacy rules" are a guidance of rules and procedures that essentially determine who has priority between the DNO's and the NESO's network under specific circumstances when flexibility services are procured, influenced by whole system value.

In the context of Flexibility Service Providers (FSPs), FSPs may offer flexibility services to more than one third party, and that the services offered are in conflict with each other. For example, FSPs may be offering generation turn-down to a DNO and generation turn-up to the NESO. In any given delivery window, it is not possible for the FSP to deliver both turn-up and turn-down. As such, a rule is required to determine whether – in this situation – the DNO or the NESO has 'primacy'.

Through this work, we aim to:

- Remove barriers to entry for FSPs and facilitate market efficiency and liquidity
- Encourage service stacking and maximise potential revenue for FSPs
- Enable conflict management and operability at a national level.

The currently identified Primacy Rules are "DNO Primacy", which means that when a conflict occurs, the DNO has the first right to dispatch flexible units on its system and the NESO must secure its required flexibility from another source. The Primacy Technical working group will continue to refine the current Primacy rules and develop use cases and additional primacy rules where these are required, in line with the evolution of flexibility markets and the needs of the NESO and the DNOs. As these rules are developed, we will incorporate them into business as usual as soon as they are required.

5.1.2. Risk of Conflict Report

The Primacy rules involve the sharing of data in the form of a Risk of Conflict (ROC) report between the DNO and NESO on a weekly basis. This report is in a .csv file format and details the constraints our ANM is managing and their location, what DERs are scheduled to be dispatched, when and where, and the conflict direction (generation turn up or down, demand turn up or down). We publish our Risk of Conflict Reports on our Open Data Portal.

Currently, there are no active conflicts that SP Electricity North West or the NESO are aware of within SP Electricity North West's licence area. We have committed that, when conflicts are identified, we will adopt the appropriate Primacy Rules and share the relevant data within the Risk of Conflict Report.

5.2. Common Evaluation Methodology (CEM)

5.2.1. Assessing the Optimal Intervention Solution

Since January 2022 we have been utilising the new Common Evaluation Methodology (CEM) and Tool as a cost benefit analysis (CBA) tool to determine the most suitable solution to meet the network needs, by comparing traditional asset reinforcement to procuring flexibility services, energy efficiency measures and Active Network Management (ANM) solutions. The CEM tool evaluates different intervention options under different load growth scenarios (Distribution Future Electricity Scenarios (DFES)) to identify the most cost-effective solution and proposes optimum contract length.

SP Electricity North West led the development of the CEM tool within Workstream 1A of the ENA Open Networks Project in collaboration with other DNOs and supported by Baringa. This standardised industry approach provides greater visibility and confidence amongst flexibility providers and helps stimulate volumes and competition in the market, ultimately reducing costs for network customers.

To demonstrate our commitment to procuring flexibility openly and transparently, we publish a high-level summary table on the previous requirement page following each tender round. In addition, to enhance transparency and confidence in our pricing strategies for flexibility services, we publish all CEM tool files on our website with detailed assumptions showing how we price flexibility services and compare them with conventional network reinforcement interventions.

5.2.2. Our Pricing Strategy for Flexibility Services

We currently operate a "pay-as-bid" pricing strategy for our flexibility tenders.

1. We utilise the CEM and Tool to **determine the ceiling price** for each constraint management zone (CMZ) within the tender; this is the price above which the use of flexibility or energy efficiency is deemed uneconomical. The ceiling price is based on the net present value (NPV) of the alternative solution(s) (e.g. network reinforcement), the volume of flexibility required (MW), and the estimated utilisation. Therefore, each CMZ may have a different ceiling price. Ceiling prices are subject to full evaluation post-bid assessment.

2. We **issue the estimated ceiling price** in the tender materials[5]. This encourages bidders to submit competitive prices, ensures consistency with our evaluation process, and drives competition in the market.
3. We **evaluate the providers' bids** against the capacity and duration of service that they are offering, as well as their bid price vs the estimated ceiling price.
    a. Bids which exceed the ceiling price are rejected as these are viewed as not offering value for money.
    b. During the assessment period, we may hold a Post Quotation Negotiation or Best and Final Offer meeting with successful bidders.
4. On occasions where it was not possible to contract for the required capacity within a tender, we implement an **alternative solution** (as determined by CEM) or **the same requirements are republished** in the subsequent tender (where it is still reasonably practical to defer network reinforcement).

6. Independent Oversight and Challenge

6.1. DSO Stakeholder Panel

As a pioneer DNO responding to the expressed desires of our stakeholders and customers who sought involvement in shaping the scope, pace and decision-making of our DSO Transition, SP Electricity North West has established a DSO Stakeholder Panel for RIIO-ED2. Our DSO Stakeholder Panel was established in 2023 to provide external oversight, enhanced transparency and fairness into our decision-making. The SP Electricity North West DSO stakeholder panel is a committee made up of independent representatives from various stakeholder groups, including customers, community organisations, Gas Distribution and industry experts, in order to reflect the diverse voices and perspectives of our DSO stakeholders.

The primary purpose of the DSO stakeholder panel is to provide valuable insight, independent oversight, challenge, review and guidance on SP Electricity North West's ongoing DSO activities. They evaluate all of our flexibility tender results and Cost Benefit Analyses. SP Electricity North West is using the output from the Panel to better inform both the ongoing delivery of its DSO Transition plan and the development of its forward DSO strategy and activities. The panel's objectives are:

- ✓ To provide appropriate oversight, challenge, review and guidance on SP Electricity North West's DSO activities

[5] *The ceiling prices for each requirement are published within 1) 'Appendix 3- Site Requirements' as part of our suite of tender documentation on our website, 2) on the tender flexibility platforms, 3) on our Open Data Portal and 4) our interactive flexibility map.*

- ✓ To act as the review body of proposed decisions that have been challenged by an affected third party, and make observations on the challenge and where appropriate make observations on a process or methodology
- ✓ To act as the review body for DSO forecasting, modelling and decision-making methodologies; and where requested make observations to change relevant methodologies, and
- ✓ To support the ongoing performance of the DSO transition using the measures of the DSO Incentive mechanism supported by evidence gathered from the DSO community in accordance with Ofgem's performance framework and guidance.

This ODMF document has been produced with support from the DSO Stakeholder Panel, where we requested their feedback and made sure their inputs were incorporated into the document.

7. Data and Information sharing

7.1. Data Portal

In line with our commitment to promote transparency and collaboration in our decision-making, SP Electricity North West increasingly embraces the power of advanced digitisation and data utilisation in sharing information and data with our stakeholders and customers. We believe that proving visibility and clear access to information and data of our network to our stakeholders plays a vital role in:

- Encouraging competition and supporting whole-system outcomes.
- Accelerating regional decarbonisation efforts.
- Fostering awareness of network capacity for developers and customers, for the connection of LCTs or other technologies
- Enabling users to develop accurate investment proposals and make informed decisions.
- Identifying opportunities for offering flexibility services and energy-efficient solutions.
- Facilitating stakeholder feedback on our plans and decision-making.
- Ensuring transparency in network development to support the transition to Net Zero.
- Supporting stakeholders in crafting well-informed energy strategies through data provisioning and collaboration with us.

To support efficiently and effective data sharing, we launched our Open Data Portal in January 2023. This portal can be freely accessed by our customers and stakeholders via the SP Electricity North West website. It meets the Energy Data Taskforce recommendations and Data Best Practice Guidance and enables stakeholders to access our data across four key themes in various accessible formats. Within our Open Data Portal, there is a range of **operational** and **non-operational** data sets freely available to users. Dependent on the dataset content, information may be spatially mapped or else observed as a table, with the ability to search, view, filter and analyse the content through a wide selection of chart types. Datasets can also be downloaded in a range of common industry standard formats, including API, KML, CSV, JSON, Shapefile and XLSX, or be accessed via API. Users are also able to enquire on datasets via the Data Portal.

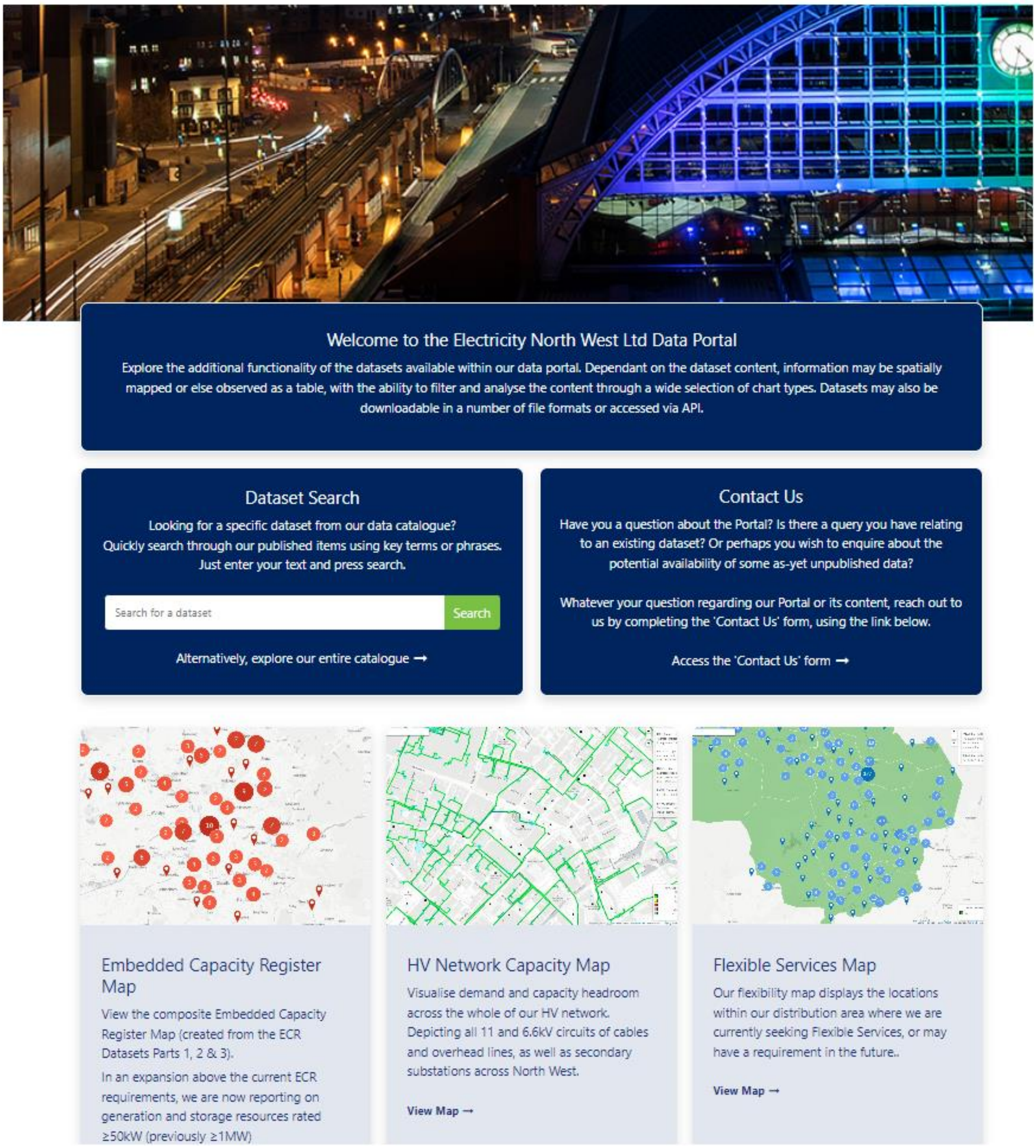


Figure 7-1 - SP Electricity North West's Open Data Portal

Non-Operational Data

Within the Open Data Portal, non-operational data is shared to allow stakeholders to make informed decisions on network activities such as flexible connections requests, flexibility services market participation, local area energy planning, regulatory decision making, etc.

Current non-operational data sets include:

- Forecasting

    - Network Development Plans (NDPs)
        - Primary & BSP Demand Capacity Headroom
        - Primary & BSP Generation Capacity Headroom
    - Distributed Future Electricity Scenarios (DFES)
    - Long Term Development Statement (LTDS)
    - Smart Meter Installation
- Flexibility Services
    - Current Requirements
        - Site Requirements
        - Postcode Data
        - Half Hourly Data
    - Historical Procurement
    - Historical Dispatch
    - Historical Procurement Locational
    - Primacy Risk of Conflict Report
- Network Data
    - Long Term Development Statement (LTDS)
    - Network Asset Viewer (NAV)
    - Substation Locations
- Capacity Data
- Reference Data (e.g. 132kV/ 33kV/ 11kV/ 6.6kV/ LV Overhead conductors, GSP voltage levels, ENWL substation data, etc.)
- Biodiversity Data
    - Site Boundary
    - Existing Tree Canopy Baseline
    - Enhancement Opportunities
    - Exclusion Management

Operational data

Within the Data Portal operational data is shared to allow stakeholders to carry out post-event analysis and tracking of historical operational flows.

Current operational data sets include:

- ENWL Boundary Flow Merge:
    - ENWL Boundary Flow – Grid Supply Point (GSP): historical records of the average apparent power flow between ENWL's and NGET's networks for each circuit for each half-hourly period (expressed in MW). These records provide data recorded since September 2021.
    - ENWL Boundary Flow - Distributed Generation Bulk Supply Point (BSP): historical records of the mean apparent power exported by generators connected to the SP Electricity North West Limited network on a half-hourly basis (expressed in kVA). These records provide data recorded since September 2022.
    - ENWL Boundary Flow - Distributed Generation Fuel Types: historical records of mean apparent power exported by generators (aggregated by Fuel Type) connected to the SP Electricity North West Limited network on

a half-hourly basis (expressed in kVA). These records provide data recorded since September 2022.

- Unplanned Outages: Outage Data is provided for the entire SP Electricity North West network with data from 1984 for faults at High Voltage (6.6kV or above) and from 2000 for Low Voltage faults. The outage data details the time, duration, cause (where known) and approximate location.
- LSOA – Domestic Heating Demand: Aggregated domestic heating demand (kWh) mapped to Lower Super Output Areas (LSOAs), with demand broken down into 20 building archetypes defined by five attributes: Fuel Type, Location, Size, Tenure, Age. Enables granular analysis of regional heating patterns to inform energy strategy, network planning, and decision-making.

7.2. Forward Look

We are working with the ENA Open Network Project and wider industry to triage further data sets which we will look to release in the future. Going forwards, new data sets will be added to our Open Data Portal, where they are triaged as being open. Additional data sets will be shared with other market entities, such as the NESO, via dedicated communications access routes such as Inter-control Centre Communications Protocol (ICCP) links and security protected Application Programming Interfaces (APIs) to enable enhanced whole system operational and non-operational decision making.

Please share your thoughts on our Data Portal with StakeholderEngagement@enwl.co.uk or you can request a data set by visiting Data Request — SP Electricity North West (opendatasoft.com)

8. Review and Update Process

We will refresh this document annually, leveraging our DSO Stakeholder Panel and wider stakeholder engagement to evaluate and iteratively improve our processes. In addition, our aspiration is to accelerate deployment of our ANM integration roadmap. An overview of our ODMF review process is outlined below.

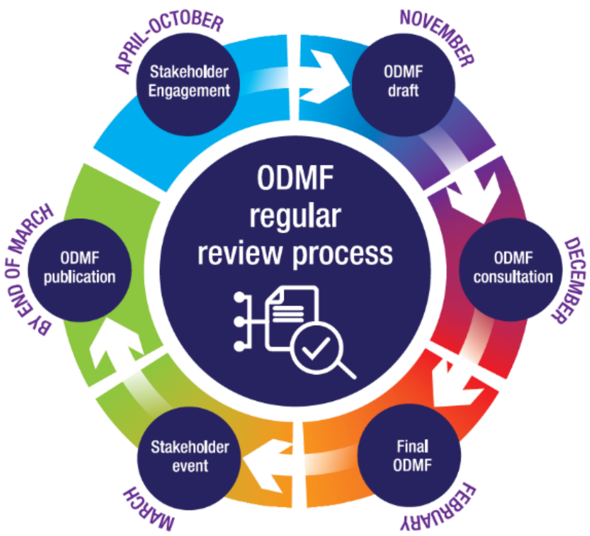


Figure 8-1 - Our ODMF review and update process

- Stakeholder Engagement: We will continue to engage with stakeholders consistently throughout the year to get their valuable feedback on the ODMF document and its associated processes and understand their expectations.
- ODM Draft: Informed by stakeholder feedback, we will draft an updated version of the ODMF, including any changes adopted to our decision-making based on stakeholders' requirements.
- ODMF consultation: We will release the new draft ODMF document for consultation to stakeholders to get their view on our ODM principles, hierarchy, and transparency, as well as the overall document structure, language, clarity etc.
- Final ODMF: We will produce the final ODMF version incorporating the feedback received during the consultation process.
- Stakeholder Event: Ahead of the official ODMF publication, we will hold a stakeholder event to present our updated approach to decision-making surrounding the use of network automation systems, flexibility measures, and human decision-making in our role as a DSO, highlighting any changes in the new version.

9. Engage with Us

If you want to speak to the team about our Operational Decision Making or Flexibility Services, please get in touch at flexible.contracts@enwl.co.uk.

We encourage feedback and collaboration to continuously improve our processes and services.

10. Glossary

A	The ampere (A) often shortened to amp, is the unit of electric current.
Aggregators	A new type of energy service provider which can increase or moderate the electricity consumption of a group of consumers according to total electricity demand on the grid
API	Application Programming Interface - a set of functions and procedures allowing the creation of applications that access the features or data of an operating system, application, or other service
ANM	Active Network Management – an application of the Network Management System that manages network constraints in real-time by using flexible assets and varying the import and/or export of DER.
ANM zone	An ANM zone is made up of all electrically connected items within the distributed network which fall under the control of an ANM zone. For example, for 11kV an ANM zone is generally made up of a single primary substation.
BAU	Business as Usual
BiTraDER	BiTraDER will investigate, design, build and trial – live on the network – options for the introduction of a bilateral trading market through which large connected customers can trade their position in the merit order stack, which determines the order in which they are asked to curtail their output at times of high demand on the network.
CEM and Tool	The Common Evaluation Methodology (CEM) developed in the ENA Open Networks Project in 2020 for evaluating a range of potential solution options, especially flexibility, against traditional reinforcement. An MS Excel Tool, based on the Ofgem CBA, was developed using the methodology for the assessment by DNOs in RIIO-ED1
CI	Customers interrupted per year - The number of customers interrupted per year (CI). This is the number of customers whose supplies have been interrupted per 100 customers per year over all incidents, where an interruption of supply lasts for three minutes or longer, excluding re-interruptions to the supply of customers previously interrupted during the same incident.
CLASS	Customer load active system services - An innovation from SP Electricity North West to provide additional capacity on the network by reducing voltage when required by National Grid.

Curtailment	Curtailment in electricity connections refers to the deliberate reduction or limitation of electricity generation or consumption during certain periods. This is done to balance the supply and demand of electricity on the power grid.
DCUSA	The Distribution Connection and Use of System Agreement (DCUSA) is a multi-party contract between licensed electricity distributors, suppliers and generators in Great Britain. It is concerned with the use of electricity distribution systems to transport electricity to or from connections to them. It is a requirement that all licensed electricity distribution businesses and suppliers become parties to the DCUSA.
DER	Distributed Energy Resources - small-scale power generation and storage such as solar, wind and electric vehicles that operate locally and are connected to a larger power grid at the distribution level
DESNZ	Department for Energy Security and Net-Zero
DFES	Distribution future electricity scenarios – forecasting plans for a range of scenarios for how low carbon technologies will be taken up and how the network could respond. The scenarios inform our investment plans and provide visibility of flexibility opportunities
DNO	Distribution Network Operator - company licensed to distribute electricity in Great Britain by the Office of Gas and Electricity Markets (Ofgem)
DNOA	Distribution Network Options Assessment
DSO	Distribution Systems Operation - The systems and processes needed to operate energy networks in the Net Zero carbon future
EHV	Extra High Voltage - Voltages over 20kV up to, but not including, 132Kv. In relation to our distribution network this means 33kV.
ENA	Energy Networks Association – Industry body which represents electricity transmission and distribution network operators
SP ENW	SP Electricity North West Limited
EV	Electric Vehicle - A vehicle that is powered by electricity
FLISR	Fault location, isolation, and service restoration (FLISR). FLISR is an automation system that will detect faults within the High Voltage network, and work to utilise tele-controllable network switches and circuit breakers to segregate a faulted asset to the smallest area it can; and then restore as many customers as it can all within 3 minutes.
FSP	Flexibility Service Provider – Customers that provide Flexibility Services
HV	High voltage - Voltages over 1kV up to, but not including, 22kV. 6.6kV or 11kV in our area.

GSP	Grid Supply Point – The Connection Point at which the Transmission System is connected to a Distribution System.
ICCP	Inter Control room Communication Protocol
kV	kilovolt - a unit of measurement that describes the voltage of an electric current, equal to 1000 volts.
LCT	Low Carbon technology such as electric vehicles, electric heat pumps, solar and renewable energy.
LIFO	Last in-First out - a 'Principle of Access' that defines how assets that contribute to the same constraint get curtailed when that constraint materialises. Under LIFO, each generation asset is assigned a position within a priority stack based on application date.
LTDS	Long Term Development Statement – the requirement to publish network information, including the likely network developments across years 0 to 5, as detailed in standard license condition 25 and the Form of Statement
LV	Low voltage - This refers to voltages up to, but not including, 1kV.
MF	Market Facilitator
MOM	Merit Order Management – ENWL's system that derives the merit order or curtailment stack, using the curtailment index and flexibility services contracts, which is shared with the ANM system for delivery
MVAr	Megavolt-amps reactive - a unit of measurement of reactive power.
MW	Megawatt – unit for measuring electric power, that equates to 1000000 watts.
MWh	Mega watt hour - a unit of measurement that describes the amount of energy produced by one Megawatt (MW) over the course of one hour.
NDP	Network Development Plan
NESO	National Energy System Operator - the UK's new publicly owned energy body, launched on 1st October 2024, independent from government control but still overseen by regulator Ofgem. NESO will be responsible for managing the planning and design of electricity and gas networks across the Great Britain. The NESO will additionally be required to balance three objectives: achieving net zero, ensuring security of supply, and ensuring efficiency and economy.
NIA	Network Innovation Allowance - a set allowance each network licensee receives as part of its price control allowance
NIC	Network Innovation Competition - annual competition where network companies compete for funding for research projects

NMS	Network Management System – an electricity network control system
NPV	Net Present Value - is a financial metric that is used to determine whether or not an investment, project, or business will be profitable down the line. The NPV of an investment is the sum of all future cash flows over the investment's lifetime, discounted to the present value.
ODMF or ODM	Operational Decision Making Framework or Operational Decision Making – sets out SP Electricity North West's approach to decision making surrounding the use of network automation systems, flexibility, and human decision making. This includes the use of Flexibility Services, Flexible Assets, and Flexible Connections.
Ofgem	Office of Gas and Electricity Markets – the government regulator for gas and electricity markets in Great Britain
Primacy	Primacy is a set of rules that establish a hierarchy among different types of network services or flexibility options. When multiple options are available, the service or flexibility with higher primacy takes precedence and the other service may be curtailed.
RIIO-ED1	Electricity distribution price control period, 2013-2023
RIIO-ED2	Electricity distribution price control period, 2023- 2028
ROC	Risk of Conflict report between the DNOs and the NESO
RTU	Remote Telemetry Unit - a cost-effective integrated control and communication unit, designed for control and monitoring of customer connections in real-time
SCADA	Supervisory Control and Data Acquisition - A SCADA system's function in the power distribution network is to monitor and control distribution sectors, optimise overall network efficiency, and provide greater system reliability and sustainability. SCADA does this by collecting data from the distribution system, most of it originating from substations.
SCR	Significant Code Review – Ofgem's Access SCR was published on 3rd May 2022 to ensure customers are able to access the electricity network efficiently and flexibility and to encourage new technologies to connect. The changes came into effect on 1st April 2023.
TL	Technical Limit - A site under a Technical Limit has non-firm access to the network (i.e. may have their output curtailed), until the transmission reinforcement works identified for their connection have been completed.

11. Useful Links

Stakeholders can find the vast majority of information relating to **Flexibility Services**, **Open Data Portal**, our **DSO Strategy**, **Forecasting**, and **Whole System Working** via our website. This includes how to get in touch with us, records of previous engagement, our current and future requirements, and all our detailed guidance documents.

Below we have provided a number of key external links which relate to the content of this document:

SP Electricity North West Flexibility Hub	https://www.enwl.co.uk/future-energy/flexibility-hub/
SP Electricity North West DSO website	https://www.enwl.co.uk/future-energy/distribution-system-operation/
SP Electricity North West Distribution Future Electricity Scenarios (DFES) Report	https://www.enwl.co.uk/get-connected/network-information/dfes/
SP Electricity North West Network Development Plan (NDP)	https://www.enwl.co.uk/get-connected/network-information/network- development-plan
Distribution Network Options Assessment	https://www.enwl.co.uk/globalassets/future-energy/dnoa/distribution- network-options-assessment-dnoa-report.pdf
SP Electricity North West Data Portal	https://www.enwl.co.uk/future-energy/data-and-digitalisation/data-portal
DSO Stakeholder panel	https://www.enwl.co.uk/future-energy/distribution-system-operation/dso-stakeholder-panel/
Sign up to receive our flexibility newsletters and event invites	https://www.enwl.co.uk/about-us/contact-us/sign-up-to-a-distribution-list/
SP Electricity North West Innovation website	https://www.enwl.co.uk/future-energy/innovation/
Ofgem website	https://www.ofgem.gov.uk/
Elexon website	https://www.elexon.co.uk/
ElectronConnect Platform	https://enwl.electronconnect.io/
Energy Networks Association (ENA) website	https://www.energynetworks.org
Flexibility in Great Britain Timeline	https://www.preceden.com/timelines/523803-flexibility-in-gb-timeline
Common Evaluation Methodology and Tool (CEM)	https://www.enwl.co.uk/globalassets/future-energy/flexibility-hub/document-library/cem-tool/common-evaluation-methodology-tool-and-docs-v3.0.zip