

Annex 2: DSO Strategy

December 2021

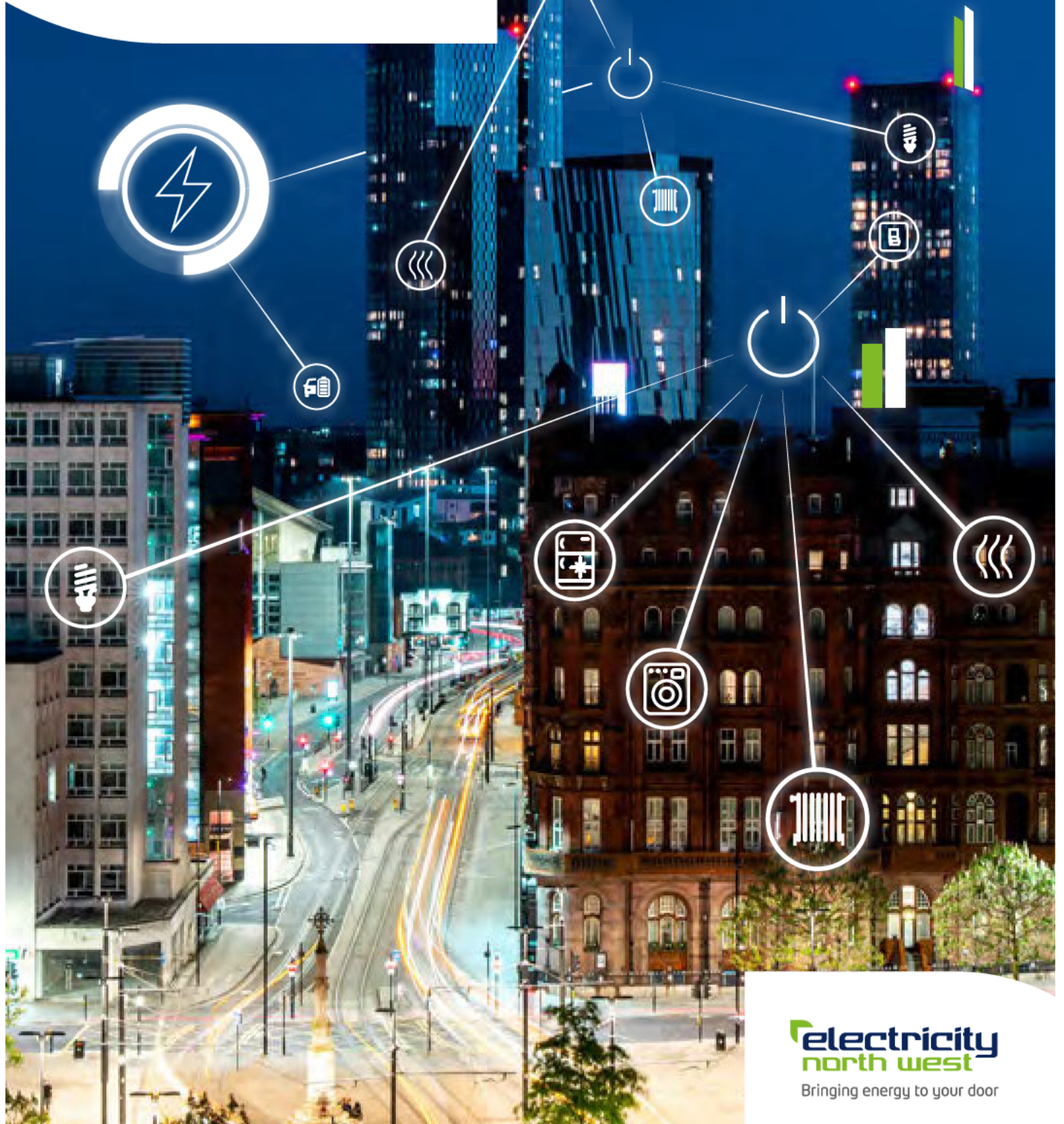
Annex 2

ED2 DSO

Transition Plan

Detailing our plans as we transition to
distribution system operation

December 2021

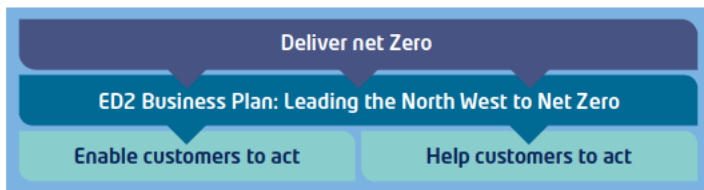


1. Executive Summary

Welcome to our DSO Transition Plan.

Our transition plan, created as an extension to our DSO Strategy refreshed in 2020, has been developed in conjunction with our stakeholders and it describes our transition to distribution system operation in the RIIO-ED2 price control period from 2023 to 2028. Distribution system operation is not one activity but rather the delivery and co-ordination of a range of functions that enables us to develop a smart and flexible distribution system able to adapt to changing customer behaviour delivering network capacity for use by customers at the most efficient cost. The importance of delivering these distribution system operation (DSO) functions must not be understated as they are vital to facilitate the energy transition on the journey to achieving Net Zero in the North West. We will ensure that the energy transition is inclusive, fair and just for all, even though each customer's journey is individual to them.

In 2019, we committed to 'lead the North West to Net Zero'. This commitment has now been embedded in our business plan for the ED2 price control period and will be realised by delivering two key areas of activity.



Firstly, our network will enable our customers to take action on Net Zero, ensuring it is continually improving and is ready for when they want to connect their renewable and low carbon technologies. All at the lowest cost. This DSO Transition Plan covers this first area of activity – enabling customers to act.

Our second area of activity is to proactively help our customers to take action on Net Zero. From inspiring them, by becoming an exemplar Net Zero organisation, to engaging them so they understand the actions they need to take, through to supporting them to deliver practical action. Further details on these activities are set out in the business plan.

This plan, although written to be a standalone document, shares common themes with many other Annexes developed as part of the Final Submission. Areas of commonality like whole system, customers in vulnerable circumstances, innovation, data digitalisation, workforce resilience and load related expenditure are interwoven throughout this plan, and where appropriate the relevant Annex is signposted.

Key initiatives

- We will have 100% network visibility, derived from a combination of smart meters and new LV monitoring equipment, and we will publish heatmaps for HV by the end of ED1 and for LV by 2025.
 - We reaffirm our commitment to flexibility first and unlocking the potential of open and efficient flexibility markets across all voltage levels. We have already signaled to the market that our initial view of our ED2 flexibility services needs are around 300MW and this will be refreshed as we receive updated data from smart meters and LV network monitoring equipment. We will collaborate with other network and system operators sharing data and coordinating the use of flexibility services to drive efficient whole electricity system outcomes.
 - We will signpost early where networks are predicted to have future capacity constraints and we will work with local partners to collectively fund the delivery of energy efficiency measures to customers in those areas; recognizing that energy efficiency is a passive solution that releases capacity, offers significant benefits to those in vulnerable circumstances and is complementary to flexibility services.
 - Through the annual Distribution Future Electricity Scenarios (DFES) development process, we engage extensively with regional stakeholders to understand their future needs and requirements, so we are well placed to support the development of local area energy plans (LAEP). To aid the development of effective local plans we will recruit three new energy planning engineers to share our knowledge, experience and data in network planning for the benefit of our local communities, ensuring that there is a coordinated whole system approach across the electricity, energy, heat and transport sectors embedded into the LAEPs across our region.
 - Enabling renewable and low carbon technologies to connect to our network effortlessly is the key to achieving Net Zero in the North West and so we will provide additional resources via three new community carbon engineers to support individuals and businesses to adopt these new technologies.
 - We are committed to digitalisation of the energy system and ensuring all stakeholders have open access to our data. Our aim is to accelerate our sharing of data as it will bring significant benefits to our customers and stakeholders. For example, it will enable the coordinated use of flexibility resources, assist customers and developers to efficiently site renewable and low carbon technologies onto our network, enable third parties to propose solutions to identified network needs, track the development and delivery of DSO functions, facilitate secondary trading, and enable the development of local area energy plans etc.
- Protecting vulnerable customers and enabling a just energy transition to ensure no customer is left behind is an important principle implicit in this plan (ie access to the benefits of smart systems and energy efficiency).

High level delivery plan

We have already started the transition to distribution system operation and we will continue to develop the new systems, techniques and processes to deliver the enhanced functionality required by our stakeholders. In collaboration with our industry partners and regional stakeholders we will implement these new systems, techniques and processes into business as usual and follow a continuous improvement cycle ensuring we are meeting, and/or exceeding the baseline expectations as required by Ofgem. The high-level plan below summarises the key delivery milestones of the DSO Transition Plan.

Our plan remains flexible to the changes required to facilitate the successful transition to distribution system operation to enable Net Zero. There remains uncertainty regarding how quickly the North West will transition towards Net Zero and the pathways which will be taken to achieve this. The policy landscape for Net Zero is fast-changing. This transition plan has been finalised in the second half of 2021, in the run up to and throughout the period of COP 26. Over this period significant new policy announcements have been made by UK government, including the commitment to decarbonise the UK's electricity system by 2035. We can expect similar such major announcements throughout the life of this plan. Our plan, its initiatives, actions, deliverables and measures have been developed using detailed forecasts and has been shaped through engagement with stakeholders and industry work in Open Networks. It is however fully flexible and is able to adapt as national and international developments impact network requirements and the solutions needed to deliver these.

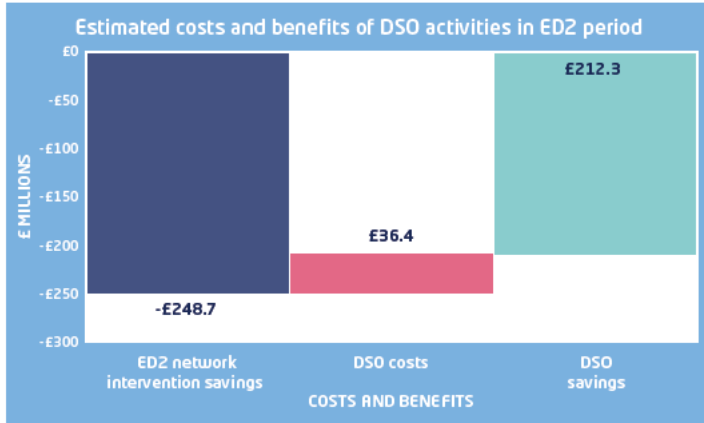


Key Initiatives	Description	RIIO-ED1					RIIO-ED2					RIIO-ED3		
		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Forecasting	Extended to cover all voltages with increased granularity and accuracy; including increased levels of network modelling and third party data sources	Development	Development	Development	Development	Implementation into business as usual	Implementation into business as usual	Implementation into business as usual	Implementation into business as usual	Continuous improvement/optimising	Continuous improvement/optimising	Continuous improvement/optimising	Continuous improvement/optimising	Continuous improvement/optimising
Modelling and Network Planning	Through modelling and network planning provide future demand and generation profiles which can be used to inform investment decision making, and promote energy efficiency measures					Implementation into business as usual	Implementation into business as usual							
Data	Collect, triage and share data in a range of formats, accessible to all. To facilitate informed investment and operational decisions by our stakeholders				Development	Development	Implementation into business as usual	Implementation into business as usual	Implementation into business as usual	Continuous improvement/optimising				
Automation and Curtailment	Increase network automation to deliver efficiency savings, and promote LCT uptake. Publish curtailment information to improve network flexibility awareness			Development	Development	Implementation into business as usual	Implementation into business as usual	Implementation into business as usual	Implementation into business as usual	Implementation into business as usual	Implementation into business as usual	Implementation into business as usual	Continuous improvement/optimising	Continuous improvement/optimising
Flexibility	Utilise a flexibility first approach to deliver DSO functionality. Ensuring that the most economical solutions are utilised. Adopting standardised approaches with other UK network operators		Development	Development	Development	Implementation into business as usual	Implementation into business as usual	Implementation into business as usual	Continuous improvement/optimising					
Stakeholder Engagement	Engage with our stakeholders to further inform our DSO transition plan. We will also create and empower a new DSO panel to oversee our DSO transition	Development	Development	Implementation into business as usual	Development	Implementation into business as usual	Implementation into business as usual	Implementation into business as usual	Implementation into business as usual	Continuous improvement/optimising	Continuous improvement/optimising	Continuous improvement/optimising	Continuous improvement/optimising	Continuous improvement/optimising
Managing Conflict of Interests	Employ a DSO compliance officer to oversee DSO functions, ensuring that any perceived or actual conflicts of interest are resolved, and produce regular auditable reporting					Implementation into business as usual	Implementation into business as usual							

■ Development
 ■ Implementation into business as usual
 ■ Continuous improvement/optimising

Benefits and costs

We are confident that our DSO Transition Plan will both drive benefits for our region's customers and ensure they benefit from the lowest possible bills while we lead the North West to Net Zero.



The cost of the ED2 DSO transition plan is £7.3 million per annum, £36.4 million for ED2. The savings in the load related expenditure budget for ED2 from distribution system activities is £248 million. These savings are driven from the application of more accurate network planning from the use of the world class ATLAS forecasting methodology and more granular data from the introduction of smart metering and network monitoring and

The chart shows the estimated savings of distribution system operation activities for ED2 as £212 million having taken into consideration the DSO costs.

These savings are summarised in the table below.

Savings generated across DSO activity areas	Value, £M
Estimated benefit of more accurate network planning from utilising the granular forecasts from the ATLAS methodology (see Section 5.1 - Forecasting)	£208.3
Benefit derived from network intervention costs from utilising granular operational data from smart meters and new monitoring equipment, offset by the (£20.6M) cost of installing new LV monitoring to achieve 95% of customer coverage (See Annex 4 – Network Visibility Strategy)	£29.4
Benefits derived from	
Total ED2 savings on network intervention cost	£248.7

Oversight and compliance

The implementation of DSO is of national strategic importance and it is vital to positively demonstrate to all stakeholders that we are making the right decisions for our customers. The DSO will need to plan long term in a much more integrated and dynamic way, integrating a huge amount of LCTs and DER resources and operate the network dispatching flexibility services in real time all whilst acting as a neutral market facilitator. We dismissed full legal separation of the RIIO-ED2 from the distribution network licensee as we believe it is too soon, costly and disruptive to progress legal separation of DSO functions and activities. Instead we plan to use the ED2 period to develop the distribution system operation activities through learning by doing and to consolidate that learning into business as usual. Over the 5 year period the DSO and DNO teams will work collaboratively to enable our workforce and leadership to fully explore, understand and implement the DSO transition. This will enable us to maximise the long-term benefits, for our customers and stakeholders, of an effective DSO and network infrastructure provider. To provide the visibility and governance required by stakeholders we have proposed an approach in the form of a comprehensive set of measures for managing actual or perceived conflicts of interest. These key measures are:

- Separation of DSO and DNO teams through the creation of a DSO directorate under a new director reporting to the Chief Executive and the Board with clear organisational responsibilities to the executive defined by ENWL's unique Table of Accountabilities approach
- Publication of the data, methodologies and rules for decision making undertaken by the DSO teams and reporting of the outcome of investment decisions
- Introduction of a new DSO Compliance Officer responsible for monitoring and reporting compliance, and
- Introduction of a new independent DSO Stakeholder Panel to provide oversight on decisions and methodologies as well as guiding, supporting and evaluating delivery of DSO transition.

Combined these measures provide a robust and transparent governance and reporting framework that will give confidence to our customers and stakeholders that we are always acting as a neutral market facilitator embracing energy efficiency and flexibility first to deliver network capacity for use by customers at the most efficient price; delivered without the need for legal separation.

We believe that the initiatives and measures outlined in our DSO Transition Plan will enable our business to transparently, economically and efficiently deliver the capacity our stakeholders and customers need to decarbonise their lives and businesses, and to allow the region's economy to grow.

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2. Introduction and guide to this annex

In this document we share the plans of our transition to distribution system operation, specifically across the ED2 price control period from 2023 to 2028, and beyond.

RIIO-ED2 will see significant change in the way electricity is generated, consumed and stored, driving innovation across the whole energy system both now and into the future. Distribution system operation is not one activity but rather the delivery and co-ordination of a range of functions that enables us to develop a smart and flexible distribution system able to adapt to changing customer behaviour delivering network capacity for use by customers at the most efficient price.

Our DSO Transition Plan covers one of two main areas of activity on Net Zero. It is focused on enabling our customers by ensuring the network is continually improving and is prepared for when they are ready to connect their heat pumps, EV chargers, solar panels, and other renewable and low carbon technologies. It sits alongside the second key area of our work on Net Zero, helping our customers to take action, which is set out in our business plan. Together, including working with partners, these two areas of activity will ensure we lead the North West to Net Zero.



The Net Zero journey and DSO transition are intertwined and in [Section 3 – Net Zero challenge and customers' priorities](#) we explain the transition challenges we face and how they are interlinked with the region's decarbonisation and development aspirations. This section also describes how our customers and stakeholders have played a key role in shaping this plan.

We draw out in [Section 4 – Key themes cutting across the DSO roles](#) the key cross cutting themes from the three DSO roles of Planning & Network Development, Network Operation and Market Development. In [Section 4.1 - Stakeholder involvement in DSO Transition](#) we describe how we will continue to strengthen and deepen our work with our stakeholders and customers with the key proposal to create a new independent DSO Stakeholder Panel to oversee the transition guided by our DSO stakeholder community and empowered to review challenged decisions and methodologies and make recommendations. [Section 4.2 - Unlocking value for customers from sharing data](#) outlines our plans for assimilating, categorising, and sharing data created and used in the activities for distribution system operation. We will ensure that all data is open and shared to facilitate innovation and value delivery for customers across the energy sector. Our data will be available via our own portal and through other industry data sharing platforms/services and accessible via visualisation tools as requested by our customers and stakeholders. We share in [Section 4.3 – Separation of DSO responsibilities and managing conflicts of interest](#) our proposals for ensuring the clear separation from DNO activities and how we are open and transparent in our decisions and delivering for customers as a neutral market facilitator. A key proposal is to create a new DSO Compliance Officer role which will have responsibility to ensure compliance. In [Section 4.4 - Flexibility First](#) we reaffirm our commitment to choosing flexibility first and explain how we will promote the development of the flexibility market, including energy efficiency. In [Section 4.5 – Delivering Whole System outcomes](#) we explain how we design and implement our systems and processes with the aim of delivering whole system outcomes when making decisions.

[Section 5 – Delivering DSO baseline expectation in each role](#) contains three subsections detailing how we will deliver the baseline expectations of each DSO in role and a section mapping our delivery of the baseline expectations in tabular form. We describe in [Section 5.1 – Role 1: Planning and Network Development](#) how we will further enhance our world leading forecasting and evaluation tools and produce granular forecasts and heatmaps for all voltage levels from smart meter data supplemented with the granular data created by the installation of new LV and HV monitoring equipment in ED2. Further information on our network monitoring strategy and proposals are contained within [Section 9.2 – Network monitoring initiative](#). In [Section 5.2 – Role 2: Network Operation](#) we describe our unique approach to curtailing flexible connections facilitated by our new Active Network Management system and how we will share the curtailment information with other network users to facilitate secondary trading and with system/network licensees to promote flexibility use across the supply chain.

We describe in [Section 5.3 – Role 3: Market Development](#) how we will increase flexibility market development and liquidity and create the environment, through the sharing of data, for flexibility

providers to maximise the value of their flexibility. We outline how we will encourage competition and innovation in platform services and support the development of curtailment liability and secondary trading.

[Section 6 – DSO costs and benefits](#) contains a high-level summary of the costs and benefits of distribution system operation in ED2.

[Section 7 – Delivering additional benefits for our customers](#) contains our ideas and initiatives, fully costed, for delivering additional benefits, over and above the baseline expectations, for our customers.

In [Section 8 – DSO Performance framework](#) we lay out our proposals for DSO performance metrics after having engaged with our customers and stakeholders over the summer and autumn periods. We have shared our proposals for ten performance measures for consideration.

The appendices in [Section 9](#) contain additional information to support the DSO Transition Plan. In [Section 9.1 - DSO Stakeholder Panel Terms of Reference](#) we propose the terms of reference for the new Panel and further information on our network monitoring proposals are contained within [Section 9.2 – Network monitoring initiative](#), whilst [Section 9.3 – Energy efficiency initiative](#) details how we will deliver energy efficiency as an alternative to traditional reinforcement and how we will amend our processes to ensure there is a level playing field for energy efficiency programmes. In [Section 9.4 – High Level Transition Plan](#) we detail the delivery milestones for the initiatives detailed in Sections 4 and 5. [Section 9.5 – Baseline Expectation Mapping](#) contains a table mapping the initiatives, activities, and deliverables with milestones to the Ofgem baseline expectations and there is an explanation of the acronyms in [Section 9.6 - Glossary](#).

There is extensive signposting to the business plan document and other Annexes throughout this DSO Transition Plan and it should be read in conjunction with the M19 table in the business plan Data Tables (BPDT) and its associated commentary.

The creation of a new DSO directorate in conjunction with our detailed proposals for compliance auditing, reporting regimes and independent panel oversight will, we believe, show our customers and stakeholders that we will make open and transparent decisions in their best interest. The costs in the BPDT clearly demonstrate that the new DSO directorate is funded by savings in load related expenditure programme and justifies the scale, scope and ambition of our DSO Transition Plan.

We believe that the measures outlined in this document will enable our business to economically and efficiently deliver the capacity our stakeholders and customers need to decarbonise their lives and businesses and to allow the region's economy to grow.



Endorsed by Steve Cox
DSO Director

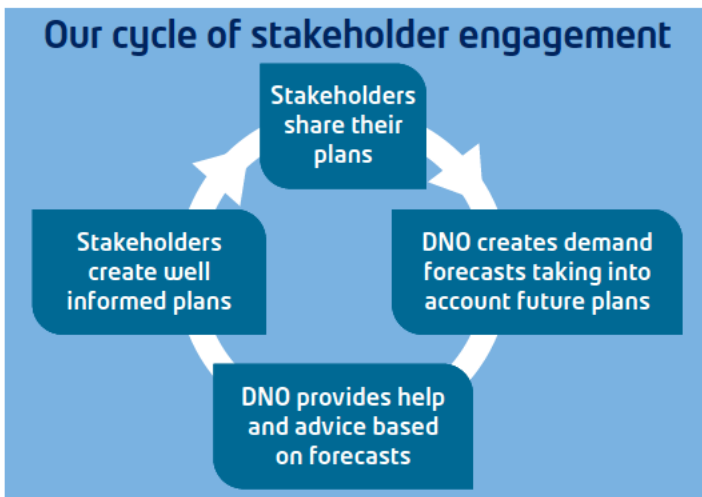
3. Net Zero challenge and customers' priorities

Key Information

In this section we lay out the challenges we see in the DSO transition and how it is interlinked with the region's decarbonisation and development aspirations. We highlight the key initiatives that we will deliver in RIIO-ED2 to deliver our vision to develop a smart and flexible system that is responsive to our customers' and stakeholders' needs now and, in the future, and how these have been developed and shaped through stakeholder engagement.

Developing an understanding of our customers' issues and needs

Figure 3.1: Stakeholder engagement cycle



As a business we are committed to stakeholder engagement. Stakeholder engagement is vital to the success of our business because it ensures we are continually checking that we are delivering our customers' needs. As part of the development of the ATLAS¹ forecasting methodology we significantly increased our engagement with customers and stakeholders to gather detailed information on their future development plans to start to assess the potential range of future demand and generation on the distribution network. In 2017 ATLAS was introduced into business as usual and in 2018 we were the first DNO to publish a Distribution Future Electricity Scenarios (DFES) document. In December 2020 we published our third which shares our views of the North West electricity landscape up to 2050. Figure 3.1 shows our engagement cycle for the annual DFES refresh. In the DFES 2020 we provided the information, shown in Figure 3.2 below, of the expected growth in low carbon technologies, driven by national policies and supplemented with stakeholders' development plans to achieve regional Net Zero commitments.

The increases over this decade are substantial and are driven by a blend of local early Net Zero commitments and a background of economic development driven by the build back better and green recovery programmes devised following the pandemic.

Figure 3.2: DFES 2020 overview

Scenario	Metric	2020	2030
Central Outlook	Annual consumption	23 TWh	29 TWh
	Electric vehicles	12,000	1 million
	Heat pumps	13,000	120,000
	Zero carbon generation	1.5 GW	2.1 GW
	Storage	0.085 GW	0.5 GW

In February 2021 we published our Regional Insights document that reports on the impact of the DFES scenarios on the network, both in the near term and a view of the long term to 2050. It provides detailed analysis of what the DFES demand and generation forecasts mean in terms of network capacity as well as signposting where there could be future network constraints. This document, used alongside our published heatmaps and the Long Term Development Statement provide stakeholders with a comprehensive view of current and future hosting capacity for the high voltage and extra high voltage networks. We are confident that our world leading ATLAS forecasting methodology captures and recognises the unique characteristics of our region. The North West of England has some of the UK's largest urban conurbations together with remote rural villages and in our region we have the highest percentage of fuel poor customers in the GB. The housing stock is relatively poorly insulated and being kept warm by natural gas and there are large volumes of rented properties. Although not unique in themselves when combined they do present us with significant challenges to develop the systems and processes to provide the network capacity in the right place and at the right time to enable the North West population to decarbonise their lives.

The pandemic has reminded us that things change, and we know that there is uncertainty around the prospective scale and timings of changes in electricity usage from societal changes in working practises, the use of transport and the continuing transition to a Net Zero carbon future. We must ensure that our network evolves to meet the challenge as our requirements change to meet our customers' Net Zero ambitions.

A DSO transition issue for Electricity North West has been the procurement of flexibility services to defer or mitigate the need for network reinforcement. Since we published our first flexibility services tender in June 2018 we have been on a journey of discovery on how best to signpost our network needs and attract potential flexibility service providers to respond to our tenders. To date we have had limited success purchasing the required volumes of flexibility services at a viable cost and subsequently have only entered into a small number of flexibility services contracts. This has meant that we have needed to seek the help of potential

providers to review our processes firstly to remove any barriers and secondly to redesign the end to end process so that it is clear, easy to follow and use. This systematic review of our approach has led us to align our process to the best industry practice and being early adopters of the standardisation work from the Open Networks Project. For example, we were the first DNO to use the common contract developed by WS1A, the flexibility workstream. Our engagement strategy focuses on inclusivity, always driving to cast the net further to involve as many customers and stakeholders as possible and we have delivered topic led webinars and surgeries based on issues important to flexibility providers. In preparation for RIIO-ED2 we issued an expression of interest in October 2020 to understand the potential volumes and price of flexibility services across the period. This early signposting of the areas identified as potentially needing network reinforcement was well received and we will continue to share this type of information as early as possible.

Our vision to address our customers' needs

Our overarching objective is to deliver a safe, reliable network for our customers and to support regional Net Zero targets in an efficient and coordinated way. Delivering enhanced DSO functionality is a key part of our commitment to lead the North West to Net Zero and ensuring we do so in the most affordable way possible. In simple terms this functionality is at the heart of a smart and flexible distribution network able to evolve to the changing ways customers produce and consume energy. How much and how quickly our customers will change in RIIO-ED2 is uncertain so we will develop further our methodologies to manage the uncertainty and/or develop solutions to remove the uncertainty. In Figure 3.3 below we highlight the key initiatives that will enable us to deliver our vision to develop a smart and flexible system that is responsive to our customers' and stakeholders' needs. Further details on these initiatives and others are contained in the remaining sections of this DSO Transition Plan.

Figure 3.3: High level summary of the initiatives by role to deliver our DSO vision

<p>Planning & Network Development</p> <ul style="list-style-type: none"> • Install HV and LV monitoring, under our Connect and Manage approach, to indicate how the networks with significant volumes of connected LCTs are operating and allowing us to enhance HV heatmaps and create LV heatmaps • Enhance the ATLAS methodology to generate forecasts at HV and LV network levels, using the data from smart meters and monitoring equipment, allowing us to run simulations to understand potential constraints, and • Encourage third parties to bring forward solutions to network constraints and enhance the evaluation methodology to assess the best whole system option. 	<p>Network Operation</p> <ul style="list-style-type: none"> • Continue to offer flexible connections with a curtailment index, that provides surety that there is a cap on the level of curtailment for all new demand and generation connections, • Apply the unique curtailment index approach within the Active Network Management (ANM) system to fairly curtail flexible connections alongside the use of purchased flexibility services, and • Apply short term forecasting techniques for the robust scheduling of flexible resources (assets, connections and services) to operate the network.
<p>Market Development</p> <ul style="list-style-type: none"> • Collaborate to deliver standardisation in products and processes, including platform services, to maximise providers' opportunities and aid market liquidity, • Strive to secure flexibility first at all voltage levels and develop the evaluation tools to take into consideration optionality, • Promote the use of energy efficiency to mitigate the need for any commercial or technical intervention, and • Facilitate curtailment liability trading and other forms of secondary trading using marketplace platforms. 	<p>Cross cutting themes</p> <ul style="list-style-type: none"> • Underpinning these initiatives, we will collect, triage and share data through a data portal on our website, • Develop a DSO stakeholder engagement framework that allows the DSO community to monitor, evaluate and guide the scope and speed of our transition, • Help our customers to take action on Net Zero by 'inspiring', 'engaging' and 'supporting them'¹. This work will cover domestic and business customers and community groups² • Lead by example by delivering our own 2038 decarbonisation plan³.

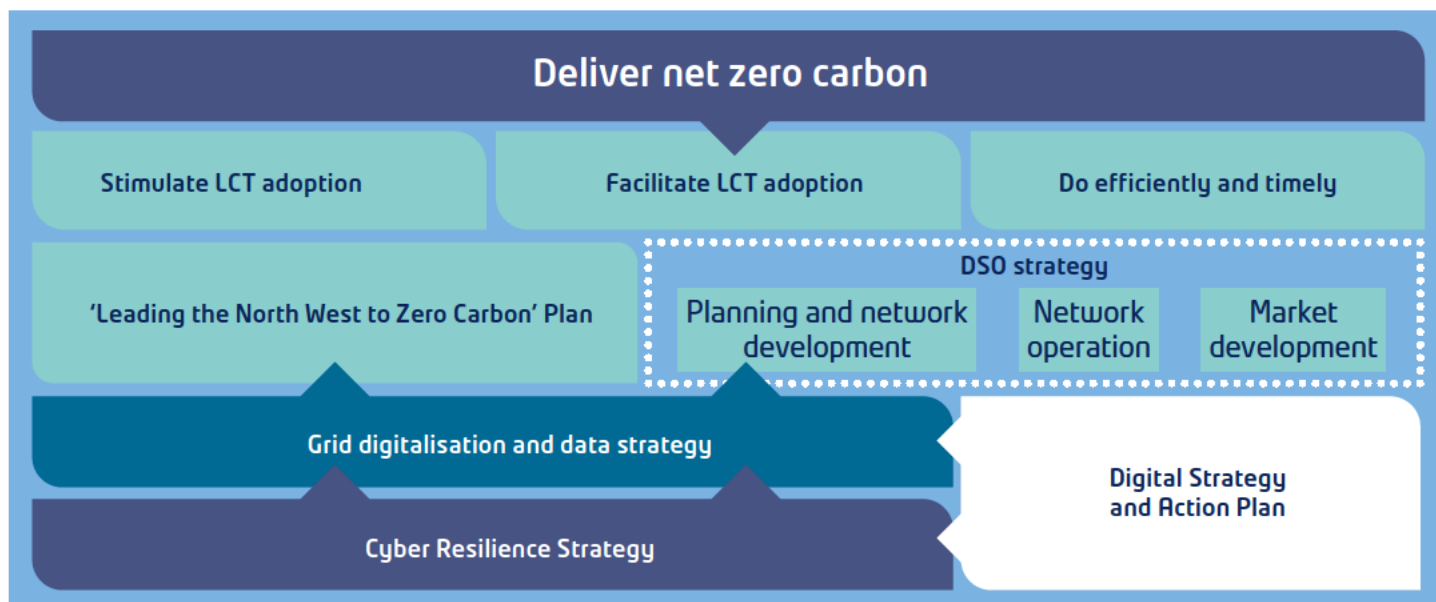
1 See our business plan for more details.

2 See our Community and Local Energy Strategy (Annex 5) for more details

3 <https://www.enwl.co.uk/go-net-zero/our-plans-to-go-net-zero/leading-the-north-west-to-net-zero/>

Developing our DSO Transition Plan with our stakeholders

Figure 3.4: How decarbonisation and DSO transition fits together



For the development of the RIIO-ED2 business plan we have undertaken an extensive and comprehensive series of engagements with all types of stakeholders to gain their feedback and help them contribute to shaping our overall business plan. We have included some DSO related elements within the general discussions and we have also sought feedback on our DSO transition plans directly. In discussions with our Customer Engagement Group (CEG) throughout 2019 and in early 2020 we determined that it was important to further clarify and harmonise our messages across the decarbonisation and DSO transition. When drafting our DSO Strategy, with the support of the CEG, we developed the graphic, shown in Figure 3.4 to illustrate simply how our decarbonisation and DSO plans were interlinked and supported by our data, digitalisation and cyber strategies.

In 2020 we published a series of consultation documents which explain how we are preparing our network for the Net Zero carbon future and how as part of the industry-wide transition to distribution system operation we will take on a neutral and trusted role in proactively managing the energy system supporting the government's commitment to achieve Net Zero emissions. Our publications, included:

- [DSO Strategy](#) – provides an update to the 2018 publication and outlines our plans for the DSO transition
- [Analysis of DSO functions](#) – analysis of our DSO-related activities against the 19 high level DSO functions defined by Ofgem in 2019
- [Grid digitalisation & data strategy](#) – our plans to install additional monitoring and control equipment across our network to facilitate the DSO transition
- [Inputs to distribution future electricity scenarios \(DFES\)](#) – a description of the inputs used to create our forecasts for future capacity requirements
- [Leading the North West to Net Zero carbon plan](#) – outlines our ambition to meet the region's carbon emissions target

and sets out the range of initiatives and investments which will ensure we take a significant step on the road to achieving rapid decarbonisation

- [Decarbonisation pathways](#) – energy blueprints developed with Cadent, the region's main gas network operator for Greater Manchester, Lancashire and Cumbria.

These publications were positively received by responders and we are grateful to everyone who took the time to provide their comments. We have updated and republished the three DSO documents with our stakeholders' comments and we have used this information to help us translate from the DSO framework previously described by 19 DSO functions to the new DSO framework of roles, activities and expectations detailed in this document. In summary our stakeholders have told us they want:

- to be more involved in our decision making
- us to provide advice and help but to keep any explanations simple, especially in the terminology we use
- us to be ambitious by leading and actively enabling the change and not just supporting it
- us to be open to using third parties in DSO activities and if necessary excluding ourselves to ensure neutrality, and
- us to set challenging Key Performance Indicators and to track and report our progress. and report our progress.

How we've responded to specific feedback that has shaped our approach is detailed in section 4.1. The summer consultations didn't receive the level of coverage from some stakeholder groupings we would have liked, particularly domestic customers, so in autumn 2020 we ran a series of engagements with domestic customers through our Deliberative Panel and Online Community. Figure 3.5 summarises the key messages and information gathered from this engagement.

Figure 3.5: Key messages from domestic customers

<p>Reliability/resilience</p> <p>Our customers want a reliable and resilient supply. They want us to provide the capacity for decarbonisation, enabling them to charge their EVs and operate their HPs; plus fit solar PV and battery storage. They understand they may occasionally go off supply, but have as short an interruption as possible.</p>	<p>Lowest cost</p> <p>Our customers want us to deliver at the best price. If we need network investment they want us to start now and to spread the costs over as many years as possible. To help achieve this the overwhelming majority agreed that the costs should be shared fairly and equally amongst the full customer base regardless of your personal benefit.</p>
<p>Fairness and inclusivity</p> <p>Our customers want us to include everyone on the journey to Net Zero. They want no one left behind - vulnerable, fuel poor or worst served customers. They don't want the wealthier to do better just because they can afford to buy EVs, solar PV panels and smart appliances.</p>	<p>Willingness to adapt behaviours</p> <p>Our customers told us if we explain the benefits of the changes to them they will be flexible and change with us. Customers would adapt their behaviours in how they use electricity if they understood why, but we would need to keep our messaging simple and make it easily adaptable into daily life.</p>

Our customers trust us and have many requirements of us as their network operator. They want us to reduce the impact of climate change and become an exemplar organisation for action on Net Zero, reaching that goal before 2050, in line with the more ambitious commitments of our local stakeholders. Our customer engagement, through our Deliberative Panel and Online Community research told us their priorities are:

- Reliability and resilience of supply
- Lowest cost
- Fairness and inclusivity.

In addition, the research highlighted that with new technologies there is a willingness to adapt behaviours i.e. to be more flexible in their use of energy. Our research has also shown us that there is a danger that the transition to a smart flexible electricity system will be challenging for some of our customers and our Electricity users in Vulnerable Circumstances strategy⁴ outlines how we will develop engagement to ensure awareness of opportunities and ensure inclusion. We have taken this information and developed our initiatives described in Figure 3.3 above. How we've used this feedback to shape our approach is detailed throughout the remaining sections.

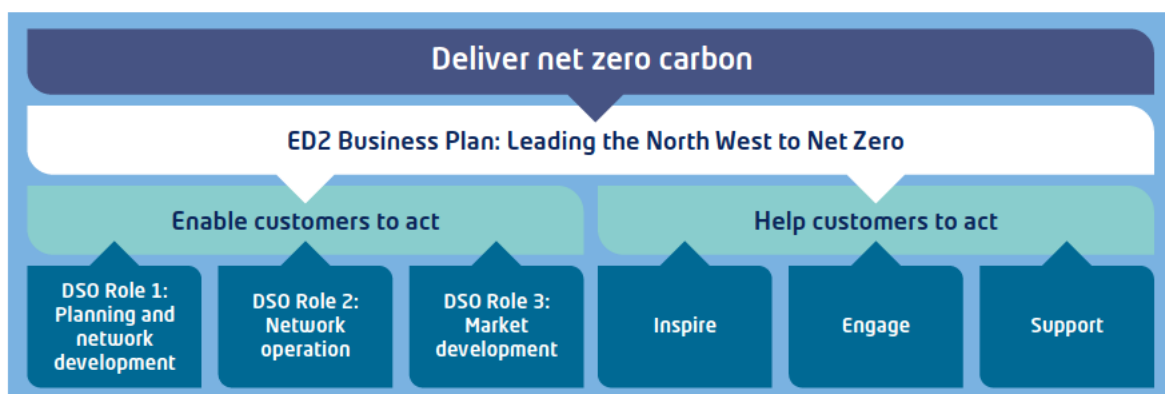
The feedback on our initial ED2 business plan highlighted the need to stress the importance of achieving Net Zero and so we have embedded 'Leading the North West to Net Zero' plan within the Final ED2 business plan. This simplified messaging is captured in Figure 3.6 showing how wider commitments on Net Zero are now embedded in the Final business plan and its Annexes.

Holding us account for delivering our transition plan

It is key that our customers and stakeholders can see how we are doing in delivering our new and enhanced DSO functions and activities so in section 8 we outline our proposed performance measures for showing progress in delivering these DSO functions and activities. But more importantly our stakeholders have indicated to us that due to the regional variations that they should be part of the process for evaluating our performance. In Section 4.1 we describe our proposals for developing a DSO Stakeholder Panel that will have the responsibility for evaluating and verifying our performance measures as well as reporting on our progress in delivering the DSO transition.

The pandemic has reminded us that as a business we need to be able to adapt quickly and responsibly to a changing situation whilst still focusing on delivering our key objectives. The North West of England has some of the UK's largest urban conurbations together with remote rural villages both of which have very different needs and demands and distinct customer and stakeholder priorities. The journey to Net Zero will be easier for some and more difficult for others however by continually engaging with our customers and stakeholders to understand their issues and priorities we can support all groups on a successful journey to Net Zero, with everyone benefiting as a result.

Figure 3.6: Revised schematic showing how DSO facilitates Net Zero



4 Please see our Annex 8 Electricity Users in Vulnerable Circumstances

4. Key themes cutting across the DSO roles

Key Information

In this section we pull out the cross-cutting themes common to each DSO role and provide a summary to aid clarity. In the next five subsections we summarise our approach to stakeholder involvement in the DSO transition, unlocking value for customers from sharing data, separation of DSO responsibilities and managing conflicts of interest, reaffirming our commitment to flexibility first and delivering whole system outcomes.

4.1 Stakeholder involvement in DSO transition

Key Information

In this subsection we lay out our plans for involving stakeholders and customers in the DSO transition. A key proposal is the creation of a new DSO Stakeholder Panel that will help shape our DSO transition. The Panel will oversee our engagement with network users and the wider stakeholder community, ensuring that they have a say in the speed and scope of our DSO transition plan. But more fundamentally we propose that this independent Panel acts as the body that evaluates and reports on our performance. With their clear focus on listening to our stakeholder community they will be empowered with the ability to review challenged decisions and methodologies and make recommendations to overturn a decision or change a methodology.

Stakeholder feedback in ED1

In summer 2020 our stakeholders' feedback from the DSO Strategy consultation gave us four key themed messages:

Figure 4.1: Summary of key stakeholder feedback from consultation

Decision-making
Our stakeholders said
More involvement in decision-making processes eg forecasting and solutions evaluation
Identify KPI measures for DSO transition
Data and data sharing
Our stakeholders said
More engagement on how to use the data
Publish the data as widely as possible and in a format consistent across the UK
Be more ambitious with leading activities rather than just supporting
Welcomed the publication of data for all voltage levels, especially LV

Our stakeholders' key message was they wanted a say on the scope and speed of our DSO transition. By openly sharing our data information and providing transparency of DSO decision making we are confident that our stakeholders and customers will be assured we will efficiently deliver the capacity and capabilities to meet their needs.

Our proposals for stakeholder involvement in ED2

We have, with the support of the Customer Engagement Group (CEG), developed the terms of reference for an independent DSO Stakeholder Panel to run throughout ED2 (see Section 9.1 for the Terms of Reference). Our vision is that the new independent DSO Stakeholder Panel will, on behalf of the DSO stakeholder community, work with the organisation to help shape the DSO transition. We intend to establish the DSO Stakeholder Panel in winter 2022 in readiness to start their new duties at the start of RIIO-ED2. Although we see the Panel as a standalone body we see there will be merit in collaborating with other established advisory Panels, such as our Consumer Vulnerability Panel, sharing knowledge and experience and coordinating activities as required going forward. It is expected that in the area of data access we will seek support from the existing CEG, prior to the formation of the DSO Stakeholder Panel.

Figure 4.2 below shows our proposals for the five broad areas of responsibility of the new DSO Stakeholder Panel. We tested our initial proposals on the role and scope of the new Panel with our CEG in winter 2020 and have amended their responsibilities in response to the Ofgem publications of Sector Specific Methodology Decision in December 2020 and ED2 business plan Guidance in April 2021 and September 2021.

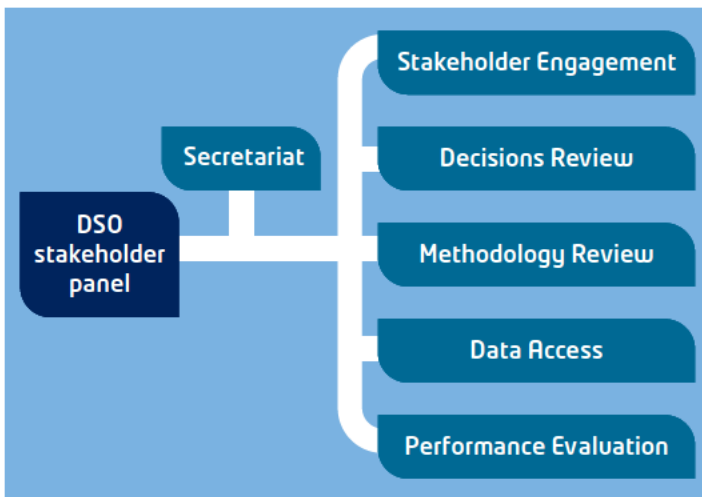
The purpose of the proposed DSO Stakeholder Panel is to provide independent oversight, challenge, review and guidance on our DSO transition. We will use the engagement with the Panel to better inform both the ongoing delivery of the DSO Transition plan and the evolution of the forward DSO strategy and activities. The objectives of this new Panel are:

- to guide our engagement with the DSO community, ensuring all customer and stakeholder grouping are appropriately engaged, including specialist stakeholders like flexibility providers;

DSO responsibilities and conflicts of interest
Our stakeholders said
Questioned our participation in contestable DSO services
ENWL should exclude itself from some market functions to fulfil its neutral market facilitator role
Concerns that using ANM especially with constraints would reduce the market for flexible services
Communications
Our stakeholders said
We prefer dedicated webinar sessions to communicate details of consultations
Your published documents should be made easier to understand

- to shape our approach to data sharing, ensuring we are delivering against the Energy Data Task Force's recommendations;
- to provide confidence to stakeholders and customers that we have published robust decision-making processes and that we are following them;
- to empower the Panel to review any decisions that are challenged by an affected party and make a recommendation whether the proposed decision should be overturned if the process has not been followed correctly or relevant facts not considered; and if a decision-making process is found to be flawed the Panel is empowered to review the methodology and make recommendations to modify it.
- As the Panel will be intrinsically involved in the delivery of DSO activities we believe that they are best placed to monitor and evaluate the ongoing performance of the DSO Transition using evidence gathered from the DSO community in accordance with Ofgem's performance framework and guidance.

Figure 4.2: DSO Stakeholder Panel's responsibilities



In summary, our proposal is that the DSO Stakeholder Panel will be formed with the scope to:

- Oversee and guide our engagement with the regional and national DSO stakeholder community,
- Manage equitability, transparency and challenge of decisions,
- Review and approve methodologies for forecasting, system modelling and decision-making,
- Define data access for everyone and specifically network users; including what data, in what format, delivered where and at what frequency, and
- Monitor and evaluate our ongoing performance, using evidence from our DSO stakeholder community and in accordance with Ofgem guidance. Publish the performance report.

Further information on how we will be guided by our DSO Stakeholder Panel or general stakeholder engagement, and involvement relevant to each DSO role is available in Section 5, the timeline for the changes is shown in Section 9.4 and the Terms of Reference are in Section 9.1.

4.2 Unlocking value for customers from sharing data

Key Information

This section in conjunction with our Data Strategy outlines our plans for assimilating, categorising, and sharing data created and used in the activities for distribution system operation. Opening this data up will enable innovators to find new uses for and form insights from it. But as these are 'unknown unknowns' we will seek guidance from our stakeholders, through the DSO Stakeholder Panel, on data and data sharing. We will make our data available on our website and other industry data sharing platforms/services and provide easy to use visualisation tools for anyone to gain insights from our DSO data, as requested by our customers and stakeholders.

Introduction

Data is a key enabler for the transition to distribution system operation and we believe that sharing data will unlock significant opportunities for our customers and stakeholders. As democratisation of electricity generation and supply helps our region to decarbonise, hundreds of thousands of renewable generators, electrical energy storage devices, electric vehicle charge points, and heat pumps will connect to the network generating new sources and types of data. We believe that openly sharing this data will foster innovation as existing and new entities find novel ways to use the data.

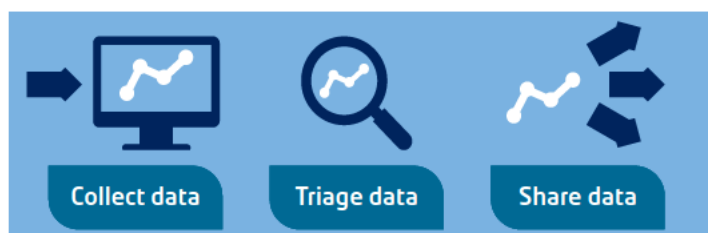
Proposed work in ED2

Our data and DSO transition journeys have already started. This DSO Transition Plan complements our recently published Digitalisation Strategy, Digitalisation Action Plan and our Data Strategy Annexes and throughout our data journey we will comply with Ofgem's Data Best Practice principles and guidance. Our Data Strategy focuses on data quality, data governance, data visibility, value from data and the development of common data terminology and models. These five focus points will enable us to maximise and optimise the value of data and ensure it supports our transition to DSO.

The response from the consultation in summer 2020 showed us that our stakeholders require us to publish more data, but also help them understand the data. So, in this DSO Transition Plan we will detail how we will collect the DSO related data, process it (excluding all confidential and commercially sensitive elements), and make it available, including through visualisation, in a format suitable for everyone to benefit from.

The data management process can be simply described as the three steps, shown diagrammatically in [Figure 3.3](#) and detailed further below.

Figure 4.3 Key steps of processing DSO data



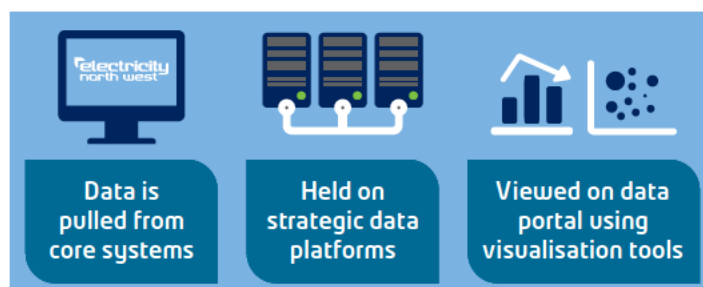
Data Collection and cleansing: Across RIIO-ED1 and ED2 periods we will capture more data as we deliver the increased range of DSO activities. Further information on the types of data that we expect to make available in the future across the three DSO roles is available in Section 5. We will follow Ofgem’s Data Best Practice principles when collecting and publishing raw data. Once collected we will review the data to check if any data is missing or corrupted and if it is we will cleanse the data.

Data Triage: We will presume all data is open unless after triaging it is classified as confidential or commercially sensitive. We will follow Ofgem’s Data Best Practice principles and work with other industry parties through the ENA Data & Digitalisation Steering Group to develop a common triage process; further information is available in the Data Strategy on the triage process. As part of openness for managing conflicts of interest we will share the details of our triage process, listing the information that is classified as non-publishable and why.

Data Sharing: After triage, the publishable data will be added to a data portal on our website, where it will be available for customers, stakeholders and other interested parties to access. We will also make this data available to industry/national data sharing services/platforms (for example the National Energy Systems Map currently being developed by the ENA and the Flexr data sharing service currently being developed by ElectraLink) and to simplify its access we will build Application Programming Interfaces (API) to allow those sharing services/platforms to retrieve and host ENWL published data. In addition, we will share our planning data and real-time operational data with other system and network licensees and other market participants. Further information on the sharing of planning data (ie single network model and network data) via the standard industry format of Common Information Method (CIM) protocol is available in Section 5.1; whilst further information on sharing real-time and near real-time operational data, via dedicated communications pathways eg Inter Control Centre Protocols (ICCP) is available in Section 5.2.

In RIIO-ED2 we will develop and implement new systems and processes to deliver the DSO baseline expectations as well as our proposed additional deliverables, which are detailed in Sections 5 & 7. These new systems and processes will use a range of existing and new datasets to function optimally, but we expect that in most cases more granular data is required both in planning and operational timescales. Figure 4.4 gives an overview of the key steps of how data is used, retrieved, stored and then shared and/or visualised for sharing. Further information on systems and software relating to the DSO transition is available in the Digitalisation Strategy Annex 23.

Figure 4.4: Systems view of data management



Put simply, in ED2 we will enable anyone to be able to, either

- download our published data, or
- where practical visualise it, using a visualisation tool for greater insights.

Working with others

Industry standardisation and collaboration: Data needs to be well understood, standard across the industry and easily accessible to a variety of users. Within our Digitalisation Strategy we committed to delivering the Energy Data Task Force’s (EDTF) recommendations and laid out, how in principle, we will deliver them over time. Throughout RIIO-ED1 we have worked with the ENA and in the Open Networks Project (ONP) to deliver industry standardisation and best practices and in RIIO-ED2 we will continue to work with the industry through the ENA Data & Digitalisation Steering Group and other initiatives, like the ONP, to deliver the Energy Data Task Force recommendations. For example, the industry has been working to establish a CIM standard for the UK and the appropriate governance arrangements for its ongoing development.

DSO Stakeholder Panel: In Section 4.1 we have laid out our proposals for stakeholder involvement in RIIO-ED2 and how the newly formed DSO Stakeholder Panel would be instrumental in helping us deliver our commitments to sharing data ensuring inclusion for all our customers. This will be in addition to the collaborative work with the industry outlined above; as we will need to engage and be guided by our own stakeholders as some of the proposed solutions to achieve the baseline expectations are bespoke to ENWL, for example our approach to curtailment using our unique curtailment index approach (see Section 5.2 for further information on the curtailment index).

Understanding the costs and benefits of digitalisation

The value that can be created by making our data available to everyone is unknown. In the RIIO-ED1 and ED2 periods the costs to collate, manage and publish our energy data will fall to our customers through their electricity bill, so we must ensure that the benefits of our increased data handling and sharing outweigh the costs both now and in the longer term. As we start to deliver on our commitment to fulfil the EDTF’s recommendations we expect that:

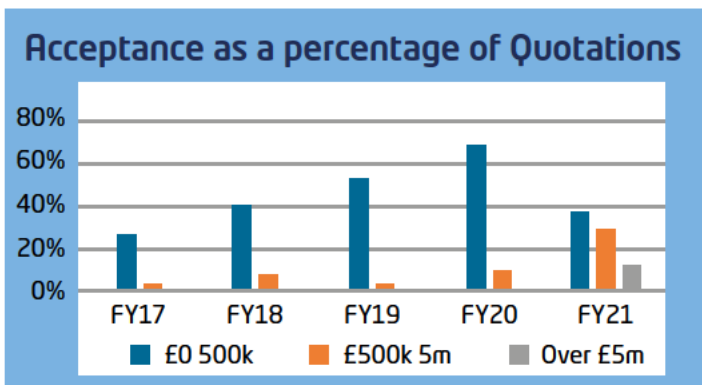
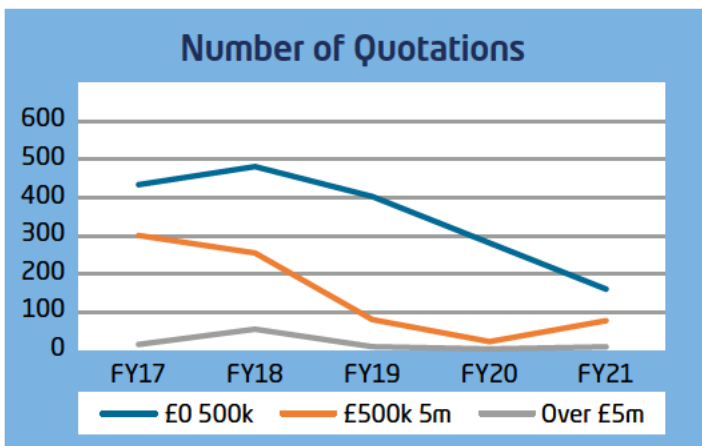
- We will gain new insights from our data that we’ve never previously thought about or seen which may help us to make better, more accurate operational decisions, reducing our costs in these price control periods and beyond. This naturally forms part of the continuous improvement cycle that delivers a reduction in our costs to serve our customers over time

- Customers and stakeholders will use our data to derive benefits for themselves in these price control periods, and
- Stakeholders will use our data, potentially combining it with other data sources, to derive benefits for themselves and potentially others in future price control periods.

We have seen via our recent experience with sharing data, how this has had a positive impact on our operations and others; an example of this is the provision of available capacity data, both in raw data form and in heatmap form to DG developers. Figure 4.5 below shows how over time the number of overall quotations dropped and the number of acceptances as a percentage of quotations increased as developers used the data to complete their own research and triage process only submitting viable applications.

Although we had suspicions that this would happen we didn't know at the time the size of the benefit. For example the range of benefits include: processing less applications reduces the overheads meaning they are delivered at lower cost; whilst for developers the upfront analysis resulted in an increased acceptance rate for applications, also reducing their overall costs. We expect there to be benefits from sharing data, however currently these are not easily quantifiable due to many unknown factors.

Figure 4.5: Change in application volumes and acceptance rates resulting from data sharing



Sharing data with our local government partners

The local authorities, combined authority and county councils in the North West are key partners in our work to 'lead the North West to Net Zero'. We share the view that the North West has the potential to be a leading region in the UK's transition to Net Zero, and that realising this potential will bring vast benefits to the region's businesses and communities, particularly when we ensure that we prioritise the most vulnerable customers so that nobody is left behind.

Our local government partners have played a key role in supporting the development of this plan and the wider business plan, ensuring it has been developed in direct response to their needs and priorities. For RIIO-ED2 we have outlined a strengthened collaboration between them and ourselves, covering both our enabling role on Net Zero and our helping customers role. The result will be our forecasts and network plans will be even more closely aligned with local priorities and local area energy plans will be directly informed by data we hold, and we will be able to target those customers who need most help with their journeys to Net Zero.

Engagement with our local government partners has identified data sharing as a key element of our current and ongoing collaboration. Further information on our planned collaboration and shared priorities is in our business plan.

Delivering our commitments

In RIIO-ED2 our data will be open and available to everyone. As data is a key enabler to develop a smart and flexible energy system that encourages participation and innovation, we have been working with other DNOs on a set of common performance metrics aimed at delivering our data sharing commitment across each of the three DSO roles. For further information see Section 8; additionally, sharing data plays a prominent part in exceeding the baseline expectations, which are detailed in Section 7.

4.3 Separation of DSO responsibilities and managing conflicts of interest

Key Information

In this section we share our proposals for ensuring that we are open and transparent in our decisions and acting as a neutral market facilitator. In the middle of RIIO-ED1 we restructured our business and brought all new DSO activities within the Engineering & Technical Directorate to ensure the clear separation from DNO activities. On 1 December 2021 we will go live with a new DSO directorate to ensure full separation of DSO activities. To ensure we have no conflicts of interest in RIIO-ED2 a newly created DSO Compliance Officer, responsible to the Board Audit Committee, will have responsibility to ensure compliance.

Proposals for ED2

In the middle of ED1 we re-structured our business to provide a focus within the Engineering & Technical directorate on DSO activities. This team provided all new DSO services under our newly created Head of DSO. This achieved clear separation of responsibilities between our Asset Management and DSO functions whilst ensuring customers benefitted from efficiencies delivered through our coordinated investment programme.

Transparent methodologies: We have been open and transparent on how we forecast, identify needs, select and evaluate options and the outcomes of our decisions. This has been done with the assistance of innovation funding to develop the processes and tools for forecasting. Through the ATLAS NIA project we developed our world leading forecasting tools and techniques; whilst through the Demand Scenarios NIA project we developed the ROCBA evaluation tool for comparing, on an equal basis, flexibility with traditional reinforcement. We intend to further develop and enhance these important tools in ED2, sharing the information on the changes as they are developed and implemented.

Stakeholder feedback to our DSO strategy consultations in summer 2020 showed that we need to go further to deliver complete confidence that there are no conflicts of interests.

Organisational structure: On 1 December 2021 we will implement a restructured organisation, with a newly formed DSO directorate, led by an executive director reporting to the Chief Executive Officer and the Board. This will be created by splitting the current Engineering & Technical directorate into an Engineering directorate, looking after the engineering and technical aspects of the DNO activities, and a new DSO directorate focused on the efficient and transparent provision of network capacity. Figure 4.6 shows the functions that will be included within the new DSO directorate. We will share all the details of the formal separation with our new DSO Stakeholder Panel so that they can assure themselves that there is full separation of DSO activities in RIIO-ED2.

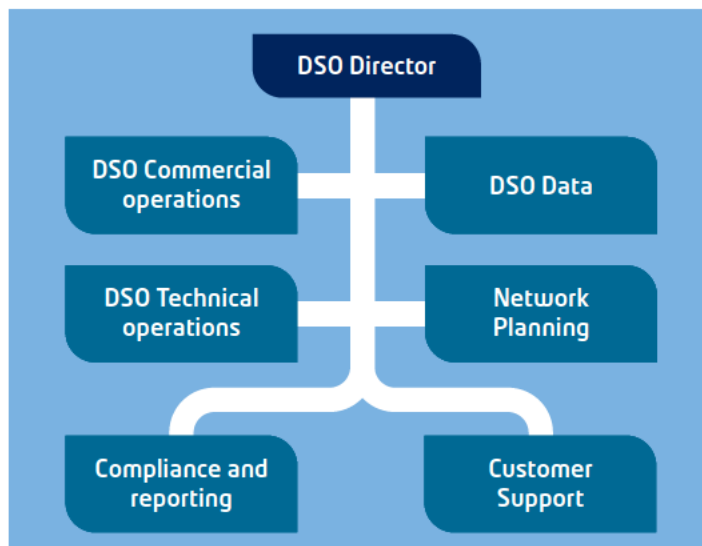
Compliance assurance and oversight: Within this new DSO directorate, we will introduce (in RIIO-ED2) two important elements:

- First, we will appoint an independent DSO Compliance Officer under our corporate function to ensure that across all DSO activity areas there is the appropriate separation of responsibilities, ensuring we are managing actual or perceived conflicts of interest, and that we are truly acting as a neutral market facilitator, and
- Secondly, as described earlier the DSO Stakeholder Panel will have the power to:
 - Review our methodologies and make recommendations for their change, and
 - Review challenged intervention decisions, and make recommendations to overturn decisions.

The DSO Director, Head of DSO and DSO Compliance Officer will work with the newly formed DSO Stakeholder Panel, detailed in Section 4.1, to show how we are delivering our DSO Strategy and Transition Plan, ensuring there are no conflicts of interest and our processes, particularly in decision-making are clear, open and transparent. The new DSO Compliance Officer will be responsible for monitoring and reporting compliance with an

annual compliance report shared with the ENWL Board and DSO Stakeholder Panel.

Figure 4.6: Functional org chart of DSO Directorate



Clear separation of responsibilities: It is important that there is clear understanding of the roles and clear accountability of responsibilities between DNO and DSO activities not only so that our decisions are transparent but that they work together for the most efficient outcomes for those that fund our operations, our customers. The transition to DSO requires a significant change to the roles and capabilities required including acting as a neutral market facilitator for flexibility, operability and peer to peer/ secondary trading. We will ensure there are clear lines of separation by identifying, classifying and recording the DSO and DNO roles and responsibilities across our processes using ENWL's unique Table of Accountabilities approach. The table of accountabilities is a method, used within Electricity North West, for assigning the roles and responsibilities for the organisation's obligations to ensure that there is executive level ownership of each obligation and clear senior leader accountability for the strategy and implementation elements. This is essential for example where the strategy is set by the DSO and delivered by the DNO. This will ensure that there are clear accountabilities when a process involves both parties; for example:

- The DSO team is responsible for the efficiency of the network and its compliance against electrical standards. They must work in coordination with the DNO team to ensure that the network delivers the network capacity as and when required at minimum cost and it provides the network reliability expected of it under the standards and by customers.
- The management of network assets is a DNO responsibility but when the DNO team proposes the replacement of an asset, they must liaise with the DSO team, as it is their responsibility to ensure the adequate provision of network capacity and reliability. Factors such as the size and configuration of the network assets in the context of its current network, the area's future development plans etc are managed by the DSO team as they are best placed to advise the DNO team on what the asset should be replaced with. For example, the current DSO team have been using the ROCBA tool to evaluate asset replacement schemes as part of business as usual since 2017.

- Reliability of the network and compliance with EREC P2/7 is a DSO team responsibility and so in evaluating how to improve its reliability the DSO team evaluates flexibility procurement against network asset solutions, including any appropriate innovative solutions. A good of example of this is where the DNO and DSO teams have worked together recently to identify and provide improved reliability for the nursing homes within our licensed area.

Where there are touch points or handover points between both parties, having clear responsibilities and strategies to manage and resolve potential conflict is key.

Summary: The implementation of DSO is of national strategic importance and it is vital to positively demonstrate to all stakeholders that we are making the right decisions for our customers. The DSO will need to plan long term in a much more integrated and dynamic way, integrating a huge amount of LCTs and DER resources and operate the network dispatching flexibility services in real time all whilst acting as a neutral market facilitator. We dismissed full legal separation of the DSO from the distribution network licensee as we believe it is too soon, costly and disruptive to progress legal separation of DSO functions and activities. Instead we plan to use the ED2 period to develop the distribution system operation activities through learning by doing and to consolidate that learning into business as usual. Over the 5 year period the DSO and DNO teams will work collaboratively to enable our workforce and leadership to fully explore, understand and implement the DSO transition. This will enable us to maximise the long-term benefits, for our customers and stakeholders, of an effective DSO and network infrastructure provider. The measures outlined above provide a robust and transparent governance and reporting framework that will give confidence to our customers and stakeholders that we are always acting as a neutral market facilitator embracing energy efficiency and flexibility first to deliver network capacity for use by customers at the most efficient price; delivered without the need for legal separation.

4.4 Flexibility First

Key Information

Our ongoing commitment is to use flexibility as our first response. Throughout RIIO-ED1 the DNOs and ESO have been collaborating on the ongoing development, through the Open Networks Project, of the common products and processes for signposting, tendering (including pre-qualification and contracts), evaluating and purchasing flexibility including its dispatch, baselining and settlement as well as coordination rules. Across GB there has been a significant increase in the scale of flexibility tendered for and purchased, compared with only three years ago, and it is only set to increase. In this section we describe the initiatives that will deliver our flexibility first commitment, ensuring again a step change in the amount of flexibility tendered, purchased and dispatched. To ensure that we are using flexibility where it is the most efficient whole life cost we will have transparent, robust methodologies and processes that show how we utilise flexibility.

Our commitment for flexibility first

Our commitment is to use flexibility as our first response.

In RIIO-ED1 we have primarily utilised flexibility to mitigate or defer the need to reinforce our distribution network with the dominant service that we have sought to purchase being Dynamic. In preparation for RIIO-ED2 we have started trialling the use of the other three flexibility products of Sustain, Secure and Restore as we seek to use flexibility for other network needs, for example construction outages and to avoid the use of carbon intensive mobile generation following network interruptions (see Figure 5.12 in Section 5.3 for further information). Where there is uncertainty in the future demand on the network we will use flexibility, as it enables us to manage the network in the interim period whilst waiting for greater certainty on the likely network demand in the future. This optionality is valuable to us and the price we are willing to pay for flexibility in the interim period will be greater due to this uncertainty. The existing evaluation models (ie ENWL's Real Options Costs Benefit Analysis and Open Networks' Common Evaluation Methodology) recognise an element of this optionality, sometimes referred to as 'option value' but the industry is collaborating currently on the methodology for calculating and exposing explicitly the value of this optionality. It is expected that the models will be developed and in use across the distribution network licensees by the start of the RIIO-ED2 period in April 2023.

Figure 4.7 below illustrates the example where the demand on a network asset has been progressively rising over time and is expected to reach the capacity of a network asset. But our range of future energy forecasts show that in one scenario the demand keeps growing, whilst in the second scenario the demand drops over time. This uncertainty creates the opportunity to utilise flexibility services. Although the two scenarios are contrasts this example is typical of the potential outcomes and so using flexibility where there is uncertainty is right to do. If the right amount of flexibility is available, and the cost of provision is below the ceiling price calculation by the common evaluation tool, then using flexibility will be the most efficient solution.

In Annex 3 Parts A, B and C, we describe our load related investment planning methodology and identify our load related expenditure requirements for ED2, including highlighting the range of uncertainty around an accelerated low carbon revolution in our region to reach Net Zero by the late 2030s and the potential impact of the implementation of the Minded to Position for the Access SCR. Figure 4.8 illustrates the range.

Figure 4.7: An illustration of the uncertainty on demand growth

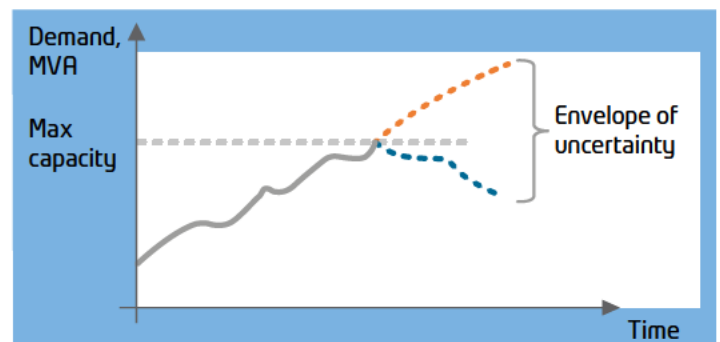


Figure 4.8: Forecast range on ED2 Load Related Expenditure

Load Related Expenditure	Regional 2050 trajectory, £M	Regional 2038 trajectory, £M
Initial business plan submission	£227.0	£475.0
Final business plan submission (including impact of Access SCR)	£711.5	£1,286.4

We have already analysed the schemes included in our portfolio of projects and identified opportunities for deferring reinforcement using flexibility based on the results of our RIIO-ED2 Expression of Interest (EoI) issued in autumn 2020. In the EoI we provided an early signal to the market that between 2023 and 2038 we expect to be seeking around 208MW of flexibility services across 21 grid and primary locations. We also indicated that we expect to seek flexibility services solutions for around 200 locations within the HV and LV networks per annum throughout RIIO-ED2. The savings forecasted from using flexibility services are already discounted from the proposed allowances. The costs and benefits in the Executive Summary shows the initial savings we have estimated from using flexibility in ED2. But we know the world never turns out as expected and so we have developed robust processes, coupled with appropriate oversight arrangements, so that anyone can see that we are committed to using flexibility in all cases where it is the most efficient whole life cost.

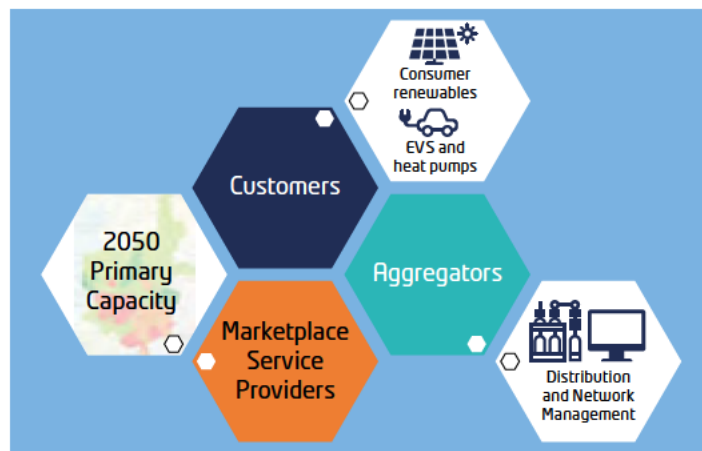
Our commitments to our customers in RIIO-ED2 are:

1. Seek to resolve all network needs using flexibility services for every intervention at EHV, HV and LV through open tendering
2. Transparently evaluate all solution options, and
3. Always choose the most efficient whole life cost solution.

How we will deliver on our commitments

At the moment the flexibility market is still developing and we will be unable to procure the flexibility we need in RIIO-ED2 without encouraging customers and key third parties to adopt new technologies and adapt their behaviours. But these actions are common for the Net Zero and DSO transitions; with the common messages of being more energy efficient, changing over to low carbon options for both transport and heat and be more flexible in your use of energy as it helps reduce you own carbon footprint as well as supporting the transition to distribution system operation. In Figure 4.9 we highlight that to develop the flexibility market we will need to encourage three key types of participants: firstly, customers to adopt LCTs and be more flexible (our business plan covers some of the actions we will deliver to support these participants); secondly third parties, like aggregators to encourage new entrants into the market to provide the flexibility, and thirdly platform providers to seamlessly link buyers and sellers either directly or indirectly. [Section 5.3](#) contains further information on how we will engage with these three key groups.

Figure 4.9: Stimulating key participants to develop the flexibility market



Our collaborative work on the standardisation of products and processes in the ENA Open Networks project will ensure that there is commonality and alignment of approach across the whole of GB, opening up the provision of platform services and flexibility to all. To ensure continuous development of the flexibility 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 market. Figure 4.10 overleaf lays out the end to end process, including the oversight and review processes, to ensure confidence that ENWL is truly acting a neutral market facilitator and any potential conflicts of interest are openly and transparently managed. The key is having a robust and granular forecasting process that identifies the future network needs, even at the LV network level. Good data sharing and signposting that provides clarity on the development needs of the network, means that all stakeholders will be able to participate in and/or benefit from the opportunities for the provision of flexibility or energy efficiency or any other alternative solution that delays or mitigates the need for development of network assets. The development of network assets will be a last resort and will only be progressed where it is the most efficient whole life cost solution.



Figure 4.10: Robust and transparent processes for delivering flexibility first

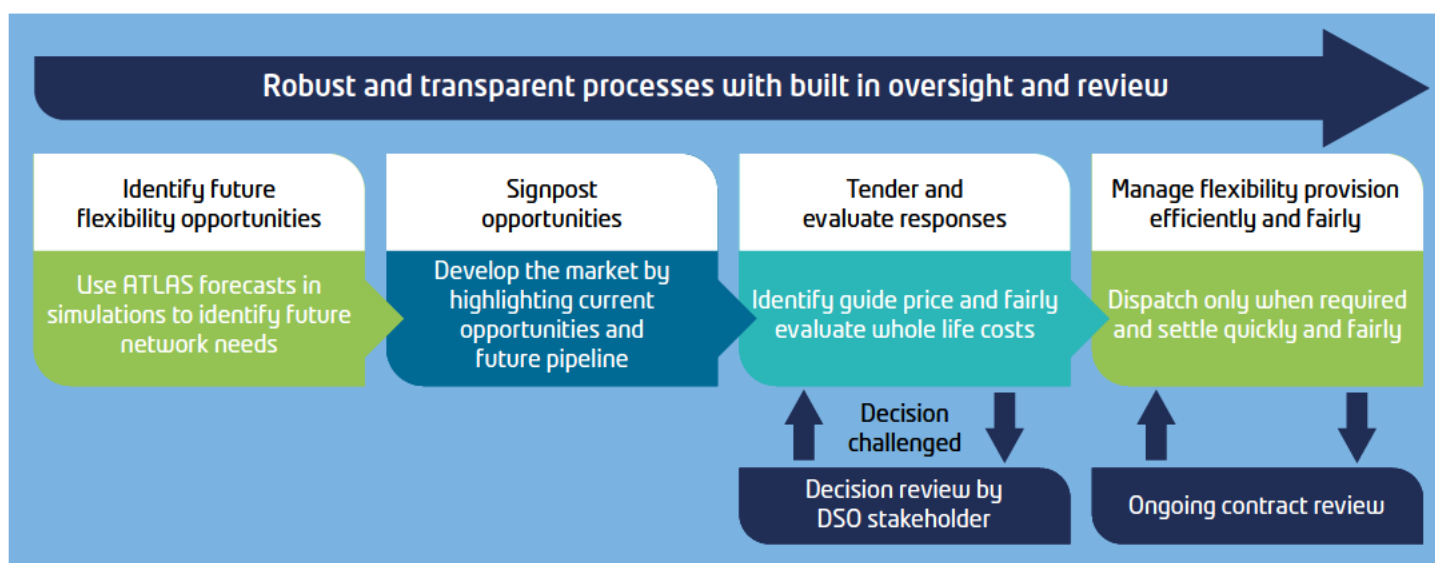


Figure 4.11 shows in tabular from the initiatives and enablers for delivering flexibility first against each of the processes identified in Figure 4.10 above.

Figure 4.11: Initiatives and enablers for delivering flexibility first

Activity	Initiatives	Enablers
1. Identify future flexibility opportunities	<ul style="list-style-type: none"> a. Collect and use new sources of data b. Use ATLAS forecasting methodology to generate granular forecasts c. Use simulation modelling to identify future constraints 	<ul style="list-style-type: none"> • Installation of new LV and HV monitoring equipment • Processing aggregated smart meter data • Revised ATLAS methodology • Revised simulation modelling
2. Signpost opportunities	<ul style="list-style-type: none"> a. Publish opportunities at least bi-annually. b. Publish Network Development Plan every 2 years (starting 2022) c. Use marketplace platforms and ENWL website for highlighting tenders d. Regular and continuous communications with existing and potential flexibility providers 	<ul style="list-style-type: none"> • Heatmaps created for all voltage levels • Regularly retender for marketplace platform provision to drive innovation, new channels to flexibility providers and price competition • Share quarterly newsletter and hold surgeries and flexibility webinars
3. Tender and evaluate responses	<p>Pre-tender</p> <ul style="list-style-type: none"> a. Use ROCBA/CEM Tool to determine ceiling price and publish within tender documentation <p>Post-tender</p> <ul style="list-style-type: none"> b. Use ROCBA/CEM Tool to evaluate tender responses and publish decision 	<ul style="list-style-type: none"> • Revised evaluation tools highlighting option value • SLC 31E reporting
4. Manage flexibility provision efficiently and fairly	<ul style="list-style-type: none"> a. Move to short term purchasing/dispatch using new short-term forecasting techniques b. Use automatic settlement based on actual provision 	<ul style="list-style-type: none"> • ANM and MOM forecasting development • Procure platform services with baselining and settlement capabilities

4.5 Delivering Whole System outcomes

Key Information

This section explains how we design and implement our systems and processes with the aim of delivering whole system outcomes when making decisions. This system wide responsibility is central to our DSO Transition plan and encompasses data sharing, forecasting, planning, optioneering, and solution provision ensuring we are complying with cooperation and coordination activities of the new whole system licence condition. We separate our activities by whole electricity, energy & heat and transport systems, highlighting that these are all parts of the whole system. At the end of this section we also comment on our plans for using the already developed CLASS functionality in ED2.

How we categorise whole system

Since the introduction of the ENA Open Networks Project in 2017 we have been increasingly thinking of whole system outcomes. Our work initially collaborating with DNOs was extended first to include the Electricity System Operator and the Transmission Operators making it whole electricity system and then subsequently the Gas Transmission and Distribution Networks incorporating whole energy system.

Figure 4.12 shows the trajectory for delivering whole system outcome through RIIO-ED2 and beyond.

The work we are doing in developing truly whole system outcomes is ongoing as we engage with regional stakeholders and customers fulfilling our role of leading the North West to Net Zero.

Everything we do relates to the whole system. Figure 4.13 illustrates how our electricity distribution network is part of the energy system which is in turn is part of the whole system and so it becomes increasingly important that our customers and stakeholders understand the decisions they make, relating to energy & heat and transport, have an impact on the whole system. As we lead the North West to Net Zero, a key role is one of coordination and cooperation with regional stakeholders and other energy sectors so that we develop collaboratively whole system outcomes at the lowest cost to customers. The revised Figure 4.14 shows the interaction with other energy vectors either directly for example through customers using natural gas to heat their home or indirectly for example from the connection of electrolysers to create green hydrogen. The graphic illustrates that as we develop and operate a smart and flexible distribution system we must continually make decisions on the development of the network in the context of a whole system, whether it is related to energy & heat, transport or customers service. To drive whole system outcomes needs collaboration and cooperation.

Figure 4.12: Trajectory for delivering whole system outcomes through ED2 and beyond

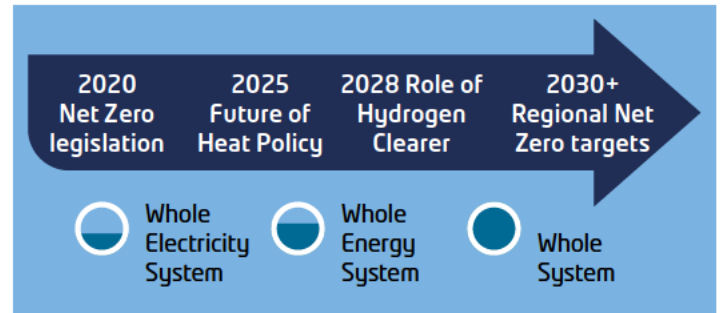
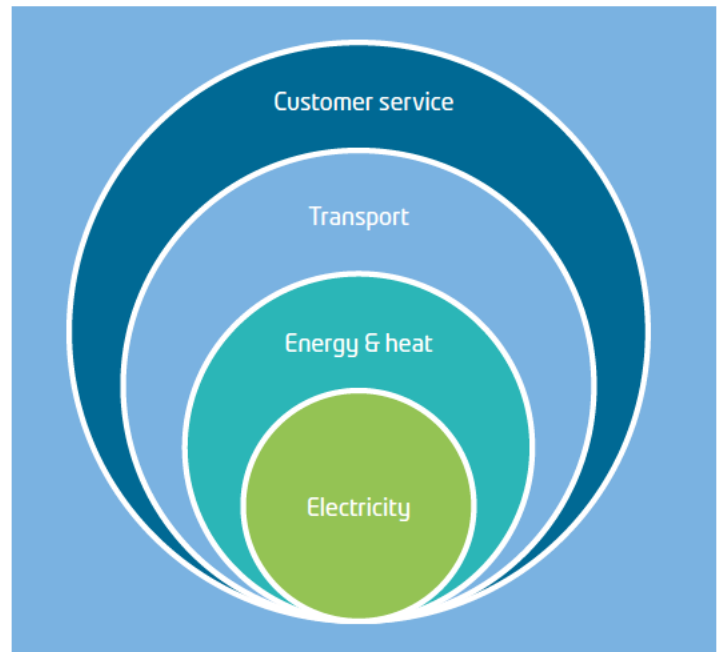


Figure 4.13: Whole system diagram



Proposals for RIIO-ED2 – Whole System

Working with other energy vectors, academic and research institutions, technology providers and local authorities will be a key part of understanding the pathways to Net Zero and formalising the whole system changes to planning processes.

We will continue to use our position to develop strategic partnerships to provide a common language for regional and national stakeholders to speak about their energy and decarbonisation needs, particularly those associated with regional planning processes. We have already begun working with the local gas distribution network operators and regional and local development agencies in both the heat and transport areas. Our regional Pathways to Net Zero arose directly from this collaboration providing both short and medium to long term action plans and certainty around which the region's actors can build their plans. Our regional pathways approach has been adopted by a number of DSOs, notably our neighbour SPEN. Through this combined working we help all actors in our region to develop plans for low carbon transportation and housing development as part of supporting local authorities develop Local Area Energy

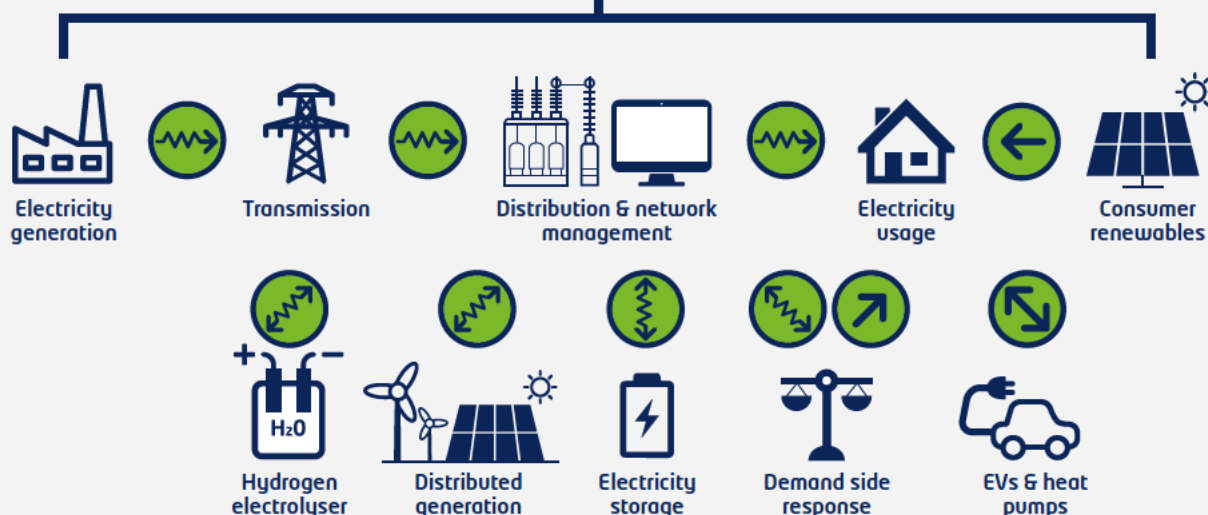


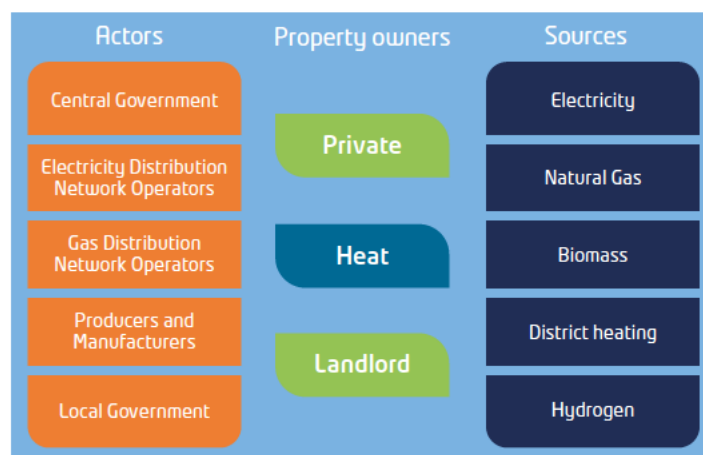
Figure 4.14: A smart, flexible distribution system is one part of an integrated whole system

Plans (LAEP). In RIIO-ED2 we will commit three additional energy planning engineers, one for each of our defined geographic areas, to support the development of the LAEPs (or similar) for all local authorities within our area. We are proposing the support for the development of LAEPs is covered by the Net Zero and Reopener Development (NZARD) fund. Stakeholder feedback has guided how we will assist with this important work, as it tells us that as the regional electrical network operator we must play a key supporting role, whilst the local authorities leaders initiate and manage the development of the LAEPs. Further details are provided in the business plan.

Whole Heat System: We have had early and significant involvement in the process of decarbonisation of heating through our work with Greater Manchester Combined Authority (GMCA). In our view GMCA has been the region's early adopter of ambitious and accelerated action on Net Zero; matched by organisational framework design that has brought together all the actors, including educational institutions, to identify and create the pathways to decarbonising heat across Greater Manchester. Figure 4.15 shows the numerous dimensions of the discussion for the decarbonisation of heat. As the regional electricity network operator we are engaging at strategic and operational levels. In our strategic role we are openly supportive, through our Chief Executive, of the GMCA political direction and our own plans for becoming a Net Zero organisation are aligned with their 2038 timescales. At an operational level we are sharing with the Combined Authority and their partners our heat pump modelling forecasts, spanning across private and public sectors in domestic and commercial properties discussing where we expect to need to provide additional capacity on our network in the future. This has allowed us to participate in early trial heat pump installation projects and join the low carbon delivery groups considering the future pipeline of heat pump installations. One such example is our collaborative work in the Greater Manchester Retrofit Taskforce where we are using our engagement with the University of Salford to find the most effective and lowest cost ways of improving energy efficiency in domestic housing, targeting those that are part of the early rollout of heat pumps across GMCA council owned domestic properties.

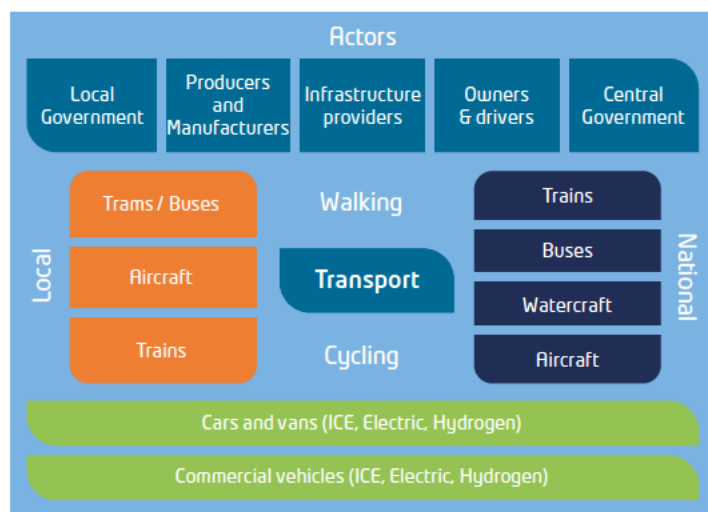
We have already used this engagement activity to shape our processes for delivering better customer service to support these estate-wide refurbishment works, and we have also used this data as a valuable input into our forecasting process. An added benefit of our collaborative engagement has been the forging of new relationships with academics and equipment manufacturers of potential alternative fuel sources. As part of our support for GMCA's Net Zero aspiration we have formed relationships with hydrogen technology providers. One such example is the Fuel Cell Innovation Centre at the Manchester Metropolitan University which has enabled us to understand the potential technological solutions and their readiness for rollout, which we have again used as an input into our forecasting process. We will utilise the early learning provided from these focused projects within GMCA to inform the development of future frameworks for whole heat system collaborations elsewhere on the regional network

Figure 4.15: Whole heat ecosystem



Whole Transport System: We are fortunate that Transport for the North (TfN) is the regional body that oversees the development of transport infrastructure in the North of England, working with local partners responsible for the provision of public services locally. Figure 4.17 illustrates how the regional body aims to holistically deliver whole system outcomes. Our engagement work with TfN has enabled us to be part of the discussions in the provision of electrical infrastructure for the decarbonisation of transport within our area, which has led onto engagement with the local providers of transport infrastructure. The holistic nature of the oversight taken by TfN means that we can support across multiple areas, wherever there is a need for network capacity to supply electricity; for example, to bus depots, on bus routes, for on-street and off-street parking, in train and tram car parks, for tramways and even for bike storage and E-bike charging. Figure 4.16 shows how the provision of transport spans local and national boundaries involving multiple stakeholders and transport and infrastructure providers. This understanding of the holistic planning of enabling individuals and companies to move across and through our region provide us an opportunity to link transport infrastructure needs to future capacity requirements providing a true whole system outcome. Working in collaboration with our neighbouring DNOs of Northern Powergrid and SP Manweb we are sharing information with TfN to deliver a project on the modelling of EV charging infrastructure needs and the associated impact on the electricity network.

Figure 4.16: Whole transport ecosystem



These engagements will continue at pace as we support our local and regional partners to develop plans for low carbon transportation and low carbon new and retrofit housing developments. All this forms part of our support to local authorities to develop Local Area Energy Plans, with the aim of meeting our customers' needs when required and at minimum cost. We are committing in RIIO-ED2 four additional dedicated personnel, within our engagement and planning activities to support the development of LAEPs and three additional dedicated personnel, as part of customer support activities, to assist individuals and organisations to adopt low carbon technologies.

Figure 4.18 below summaries how through our engagement and development work we are delivering whole system outcomes in general and specifically in the areas of heat and transport. As part of the horizon scanning of technological developments we have formed relationships to aid our understanding of the potential technological solutions and their readiness for rollout.

Figure 4.17: Regional Co-ordination

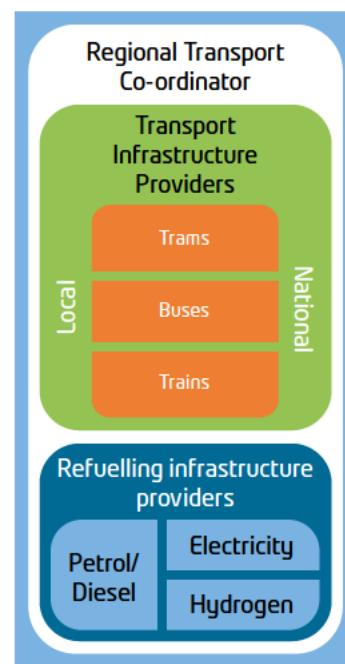


Figure 4.18: Examples of whole system initiatives, including Heat and Transport

Understanding our customers and stakeholders needs			
Initiative	Area	Description	Whole System Outcome
Stakeholder engagement	General	Sharing knowledge and information with partners, communities and stakeholders and gaining their feedback	Enables better and coordinated decision-making across networks
Local Area Energy Area Plans (LAEP)	Whole System	Sharing our information and supporting the development of local energy plans	Understand future impact and coordinate response
Decarbonisation Pathways	Whole System	Collaborative working with Cadent gas and local authorities to deliver energy system analysis of hosting capacity and potential constraints	Signals hosting capacity and potential constraints
Cumbria Local Enterprise Partnership - Nuclear	Whole System	Collaborative working with national and local partners examining the potential for small scale nuclear close to the Sellafield site	Understand future impact and coordinate response
Transport for the North	Transport	Collaborative working between TfN and other DNOs for EV charging infrastructure model development project	Enables better and coordinated decision-making across transport and electricity networks
OZEV	Transport	Collaborative working with OZEV and MSOA to provide network capacity for EV charging infrastructure	Evaluation tools that take into consideration whole system costs and benefits
Manchester Airport Group	Transport	Collaborative working to help them to decarbonise their ground operations	Delivering a Net Zero airport whilst not overloading the distribution network
Hybrid heating GB coalition	Heat	A collaboration of electricity, gas, and manufacturers formed to encourage the adoption of hybrid heating technologies	Maximising the energy networks infrastructure, deferring reinforcement, cheaper decarbonisation of heat for retrofit applications, providing network flexibility.
Greater Manchester Retrofit Taskforce	Heat	Collaborative working using results from University of Salford's studies on building design and energy efficiency to define electric/ hybrid/ hydrogen options for domestic heat	Identifying the most effective and lowest cost ways of improving energy efficiency in domestic housing and starting early heat pump installations in GMCA council owned properties
Community and local energy groups	Heat and Transport	A collaboration of electricity, gas, and manufacturers formed to encourage the adoption of hybrid heating technologies	Easier connection of LCTs. Profits and benefits from LCT uptakes stay within local communities. They have a vested interest in decarbonisation
Technological horizon scanning	Heat and Transport	Understand technological advancements and likely timings into solutions	Blue and green hydrogen production, commercial and domestic size electrolysers and hydrogen storage options

Proposals for ED2 – Whole Energy System

Figure 4.19: Summary of whole energy system initiatives within DSO role 1, Planning and Network Development

Role 1: Planning and Network Development		
Initiative	Description	Whole Energy System Outcome
ATLAS	Create and share granular kW and kVAr forecasts	Understand future impact and coordinate response
Heatmaps	Publish heatmaps for all voltage levels	Signals hosting capacity and constraints
ROCBA	Amend ROCBA to include quantitative and qualitative inputs for whole energy system outcomes	Evaluation tools that take into consideration whole energy system costs and benefits
Data exchange	Share planning data in CIM format	Enables better and coordinated decision-making across networks
Stakeholder engagement	Regularly engage with adjacent and embedded system/network operators	Enables better and coordinated decision-making across networks
Energy efficiency	Purchase energy efficiency solutions	Facilitates general reduction in energy consumption

In RIIO-ED2 we will use the ATLAS methodology to deliver real and reactive power (kW and kVAR) forecasts for all voltage levels, including HV and LV network assets. As part of the Whole System FES process established in the Open Network Project we already share MWh and LCT volume forecasts with the ESO. We will expand on this and share with the ESO our reactive power (MVAR) forecasts at the interface boundary points with the Transmission network to enable the ESO to enhance their modelling of reactive power flows for managing network voltage, both in planning and operational timescales.

The forecast data will be available to our stakeholders, but we will also use it to develop and publish a full range of heatmaps, from 132kV to LV. These heatmaps will provide valuable information to developers and customers on availability of network capacity, but also signal opportunities to solution providers eg energy efficiency/flexibility services providers to offer options for mitigating network needs. Information will be presented in easy to read formats for humans as well as machine readable formats with explanatory detail so that different customer groups can understand and act on it.

In RIIO-ED2 we will continue to develop the ROCBA model as well as introduce a process and methodology to identify and evaluate the benefits of the options, from the perspective of other system or network licensees. Where possible it will be quantitative, but even if it is only qualitative it will allow us to consider whole system benefits in our decision-making. We will actively seek alternative solutions to conventional reinforcement; including those from other system and network operators and third parties. Through projects, such as the ESO's pathfinder work, we have already seen the benefits which can be created by allowing other network operators to offer solutions to resolve issues within the distribution network. It is anticipated that IDNOs, the TO, and other DNOs we share boundaries with may be able to offer solutions to network constraints within the ENWL network, these solutions may be cheaper and more efficient than conventional reinforcement or utilisation of flexible services and connections. Other novel solutions may be presented by other external parties, which will also be encouraged and assessed within options assessment processes. Encouraging as many possible solutions to be considered will also encourage future market liquidity, reduce the cost to operate the network, optimise efficiency of network operation, and provide the best service to our customers. Note, where it is not possible to evaluate an option using either the ROCBA or CEM assessment tools we will use the Whole System CBA developed within the Open Networks Project.

By ED2 we will be sharing enhanced data exchanges of planning

data with the TO and ESO. We will also look to develop and integrate standardised enhanced data processes with the other networks we share boundaries with i.e. other DNOs and IDNOs. This sharing of enhanced planning data will allow all parties to build a more granular picture of the other networks and will facilitate the increased development of whole system solutions and collaborative working.

Working with other energy vectors and local authorities will be a key part of developing whole system changes to planning processes. We will continue to use our position to develop strategic partnerships to provide a common front for regional and national stakeholders to speak about their energy and decarbonisation needs, particularly those associated with regional planning processes.

In Section 9.3 we outline our proposals for utilising energy efficiency measures to reduce demands on highly loaded areas of our network, as well as promoting general energy efficiency across the network. By reducing the overall demand on the network and promoting shifting when people use the network we can reduce the overall level of energy needing to be produced across the whole system, optimise energy usage to when it can be generated from renewable sources, and reduce the amount of overall investment required across the distribution and transmission networks. We have also seen that through engaging with energy efficiency programmes, this can be the catalyst to wider systemic changes to achieving Net Zero.

Within network operations there are a range of data exchange activities which already exist between DNOs, IDNOs, TOs, and the ESO. Within RIIO-ED2; the quantity, quality, granularity, and frequency of these data exchanges will need to increase to deliver whole system co-ordination and efficiency of decision making.

We will utilise data transfer links, e.g. ICCP links, to share near real-time operational data between control rooms and their supporting systems. Sharing these data flows will aid with:

- Ensuring that energy flows across boundaries between networks are managed in a more co-ordinated manner
- Ensuring that we are communicating the real time utilisation of flexible resources within the network
- Communicating the state of automation systems such as Active Network Management (ANM). These systems may have a material impact on the delivery of these services; for example automation systems may impede the provision of flexible services from DERs procured by other parties

Figure 4.20: Summary of whole energy system initiatives within DSO role 2, Network Operation

Role 2: Network Operation		
Initiative	Description	Whole Energy System Outcome
Data exchange	Share operational data in real-time	Enables better and coordinated decision-making across networks
Conflict management	Share constraint data and DER usage	Facilitates coordinated actions

Figure 4.21: Summary of whole energy system initiatives within DSO role 3, Market Development

Role 3: Market Development		
Initiative	Description	Whole Energy System Outcome
Heatmaps	Publish heatmaps for all voltage levels	Promotes potential opportunities for coordination
Flexibility standardisation	Continue industry standardisation	Facilitates flexibility stacking by providers
Regular platform retendering	Retender platform services	Promotes innovation and cost competition
Curtailment data exchange	Share stack information	Promotes opportunities for secondary trading and coordination

- Communicating information during unplanned system wide events e.g. Storms, Black Start, Low Frequency Demand Disconnection. This messaging will help to speed up restoration times as well as co-ordinating stakeholder messaging, and
- Communicating changes to any planned DER engagement stack orders, where these are materially changed compared to any information shared via other short/medium term data exchange methods (as detailed below).

For activities which do not require near real-time operational data transfers; additional communications pathways will be established to share operational data. These activities include:

- Sharing of ANM curtailment and flexible services forecast engagement orders. With this information the other network and system operators can ensure that they do not have any conflicts of engagement with services they have procured;
- Relevant planned outage data. This ensures that the boundary flows can be managed as well as giving other network and system operators the opportunity to assess the impacts of outages on any flexible services they have procured.

Where conflicts of service occur, we will act as a neutral market facilitator to allow DER owners to carry out secondary trading of curtailment and flexible services. An example of where this may be utilised in the context of whole system operation.

There may be occasions where a network or system operator found a service they had procured within the DNO network was embedded within a curtailment stack and was predicted to be curtailed when it was due to be delivering a service to the procurer. In this scenario they, or the service supplier, could carry out some secondary trading of curtailment liability to ensure that the service they had procured would be at a lower risk of being curtailed.

The publications of our heatmaps mentioned above in Role 1 will facilitate the development of the flexibility services markets and enable third party options to be developed for mitigating network needs. To aid the wider circulation of the background information contained within the heatmaps it will also be made available to industry/national data sharing services/platforms; for example, we envisage this data being contained within the National Energy Systems Map currently being developed by the ENA.

In RIIO-ED1 we have already worked to standardise flexible services with the other UK DNOs and we are starting work to further align these products with the ESO. We have been a key driver of flexible services standardisation, through our work with the Open Networks Project to date. In ED2 we will work towards further standardisation of products, baseline standards, contracts, dispatch, and settlement. Through standardisation it allows for the development of best practice, as well as offering stakeholders a common approach to flexibility.

We are working to encourage market development and liquidity through regular tenders for flexibility. Through the development of the flexible services markets within the North West our regional stakeholders benefit from driving down the requirements for asset reinforcement. This also offers whole system benefits by developing a market for DER providers to stack service provision to multiple entities and begin to offer peer to peer energy trading within local and national energy markets.

We anticipate that within the remaining part of RIIO-ED1 and the start of RIIO-ED2 that we will continue to seed the development of flexibility trading platforms. At the start of RIIO-ED2 we anticipate that there will be sufficient competition within the market to allow us to move to regular competitive tendering of which flexibility platforms we utilise. The transition to more frequent competitive tendering of flexibility platforms will encourage competition in

the market leading to widescale reductions in cost, as well as encouraging continuous development of these platforms to offer the latest features and improvements to the user experience.

Through sharing of planning and operational data with other network and system operators, as described above, this allows for opportunities for conflict management of services without the requirements for exclusivity clauses. We do not have any exclusivity clauses within our flexible services contracts, and we have committed that we do not intend to introduce any. This allows for the freedom for service providers to stack revenues by offering different services to multiple parties. In RIIO-ED2 we will develop the capabilities for users to trade positions in curtailment and flexibility services stacks, which opens up a new market of energy trading and ensures that users have the opportunity to trade their way out of a curtailment stack in order that they can fulfil contracts with other network and system operators. The high-level transition plan in Section 9.4 and the mapping table in Section 9.5 detail the delivery milestones of when these activities will take place.

CLASS proposals for ED2 supporting Whole Energy System

As the developer of the CLASS functionality and techniques through the Second Tier Low Carbon Networks Funded project of the same name we have continually provided Ofgem with information on how we took CLASS from an innovation project and implemented it as business as usual providing services to the ESO.

We expect to continue to provide services to the ESO using the CLASS functionality and where practicable and economic, we will use CLASS to manage demand on our own network assets.

The financing for the rollout of CLASS functionality was jointly funded by shareholders and our customers hence the income received from the provision of the CLASS services is shared between customers and shareholders. During RIIO-ED1 we have been reporting, through the annual RIGs report, the income from CLASS services. We note the Minded to Position in 2020 to continue to report income under the Directly Remunerated Services 8 category in RIIO- ED2 but await the outcome of the consultations in 2022 for how income should be reported in RIIO-ED2.

We have no further plans at this time to retrospectively install CLASS functionality in our substations in RIIO-ED2 but we are working with a range of stakeholders including sharing our learning with other DNOs to assist them in their considerations for CLASS deployment and the benefits it can bring to their customers. We have submitted a Consumer Value Proposition (CVP) for CLASS provision in RIIO-ED2 as part of the final business plan. This contains information on our assumptions about regulatory treatment in RIIO-ED2, which we assume to continue as per RIIO-ED1, as well as highlighting the (opex and capex) costs and benefits. Our intended use of CLASS is to position it to best effect for consumer benefit within the prevailing regulatory arrangements decided by Ofgem for RIIO-ED2. This would include provision to either the ESO (or it's successors) or the relevant DSO. For clarity our view is the provision of CLASS is a DNO activity though the decisions about best use of CLASS capability alongside a range of other options (e.g. EE, other balancing service) is a ESO/DSO activity and choice. We intend to have the current number of sites available to operate in RIIO-ED2 which can provide a range of CLASS services over varying timescales and at different MW capabilities. The CLASS CVP contains information about the volumes of capability we will have available in RIIO-ED2.

We have undertaken further work to explore the larger scale rollout of CLASS on the energy markets generally and have discussed this with Ofgem, the ESO and the other DNOs to aid a comprehensive whole system consideration of the potential impacts and net benefits to GB.

5. Delivering DSO baseline expectations in each role

Key information

In this section we lay out how we will fulfil our DSO baseline expectations as defined within the ED2 business plan Guidance issued in April 2021 and updated in September 2021. The roles are shown in order with headings signposting our proposals in that area. Cross-referencing is provided either where detail has already been shared in Section 4, key themes cutting across the DSO roles or further detail is contained in other Annexes or sections of this document such as the Appendices.

5.1 Role 1: Planning and network development

In RIIO-ED2 we will enhance our forecasting and modelling capabilities to plan for a smart and flexible distribution system, embracing opportunities provided from new data sources to transform how we signpost future network needs, even at the lower voltage levels, and seek out new solutions to mitigate these needs at the best value to our customers. A timeline for all these proposals is detailed in Sections 9.4, whilst the actions, initiatives and deliverables for role 1 are mapped to the baseline expectations in Section 9.5.

Forecasting: In RIIO-ED1 we developed and introduced the ATLAS forecasting methodology and have been progressively enhancing its capabilities; for example, we are currently developing a framework for managing the uncertainty of electric vehicle (EV) charging as part of the [Reflect NIA project](#). This methodology takes inputs from our regional stakeholders and, using the ESO's Future Energy Scenario framework, creates a range of forecasts that indicate potential futures. ATLAS delivers a balanced view of MW and MVAR forecasts described as a best view/central outlook (noting that Electricity North West is the only DNO to produce and share MVAR forecast information).

Figure 5.1: Potential future uses of flexibility in network operations

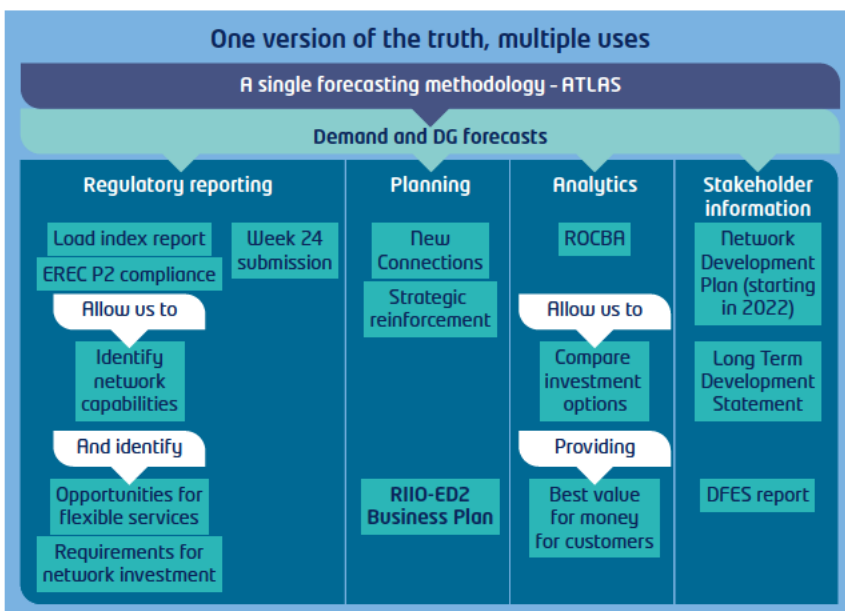


Figure 5.1 highlights that we generate forecast information (ie one version of the truth) using the ATLAS methodology and this has multiple uses ensuring consistency. These forecasts are used for all planning activities, and in the production of our [Distribution Future Electricity Scenarios \(DFES\)](#), [Long Term Development Statement \(LTDS\)](#) and the regulatory reporting of load indices; with the same information being used to create the Network Development Plan (NDP) in 2022. Our LTDS and DFES data is currently published on our website, and we will provide this to other industry/national data-sharing services/platforms, as they come available. Our forecasting and network planning activities are important to ensure that our network does not act as barrier to achieving carbon budgets and Net Zero and our Strategic Vision, included in Annex 3, Parts A, B and C outlines how we plan and account for key uncertainties in a transparent manner.

In RIIO-ED2 we will improve ATLAS further by incorporating aggregated smart meter data together with data from our own LV and HV network monitors to improve the accuracy of our LV and HV forecasts. We will also incorporate data from other sources, for example IDNOs. Under DSO, one of our key roles is to ensure we create the capacity our customers need in sufficient time to allow them to decarbonise their lives. This can only be efficiently achieved through the analysis and understanding of this data, which will enable us to understand the actual impact of technologies such as EVs and electric heat pumps on domestic and non-domestic demand. Our connect and manage research in ED1 has shown how monitoring and analysis can enable significant additional capacity to be released using existing assets which customers have already paid for.

By the end of ED1 we will have LV monitoring on 3,531 of the most populous ground-mounted substations that supply electricity to about 1.024 million customers ie around 43% of all connected customers. We also expect to have access to consumption data from smart meters for up to 70% of our domestic customers. We will continue this ambitious monitoring rollout programme installing LV and HV monitoring equipment throughout ED2. The tactical installation of a further [redacted] sets of LV monitoring equipment at distribution substations will increase the coverage of customers to 95%. We will also install monitoring equipment on [redacted] overhead HV circuits in RIIO-ED2 with the aim of delivering significant savings to our customers through the connect and manage programme as they adopt even more low carbon technologies (LCTs). The greater visibility of the operation of LV and HV networks will enable us to model these networks to target flexibility use and energy efficiency programmes and/or forecast when and what type of reinforcement interventions will be needed. See further information on our Network Monitoring Initiative in [Appendix 9.2](#), and in our Network Visibility Strategy in Annex 4.

The primary benefit of increased LV network usage data is understanding the actual utilisation of lower voltage network assets. It enables us to better identify constraints and target the purchasing of flexibility or energy efficiency from relatively small groups of customers i.e. <200. Installed LV network monitoring equipment provides harmonic levels, network voltage and current flow in the neutral conductor. This defines

the maximum number of LCTs that can be safely connected to the network; whereas aggregated smart meter data only provides the average assumed current flow in each phase conductor i.e. the thermal capacity view.

In RIIO-ED1, knowing how valuable network usage data is for operating a smart and flexible network, we also took the decision to install low cost monitoring on targeted HV networks and at selective distribution substations to obtain a clearer picture of how our networks were operating.

The increased penetration of LV and HV monitoring equipment provides greater visibility of the operation of LV and HV networks that will enable us to 1) create LV heatmaps (see case study below) and enhanced HV heatmaps, 2) model LV networks (see network simulations below) and 3) signal the potential need for energy efficiency and/or flexibility from local communities.

Developing the skills for a successful DSO transition

A successful transition to DSO will be delivered by motivated and skilled colleagues across a number of teams within Electricity North West, not just by the central DSO team. We expect to face lots of new and exciting challenges as we transition and although the role of planning and network development is well defined and reasonably understood, one of the biggest challenges in this role will be data analytics and the task of managing and utilising large amounts of data for our enhanced modelling activities. Our approach will be three pronged, balancing existing need with longer term requirements:

1. Upskilling existing personnel,
2. Recruiting new personnel with required skills, and
3. Recruiting school leavers and providing training.

The research undertaken by our recruitment providers shows that the North West education providers are able to deliver the right courses for action 1 and 3 above, and the recruitment market has the necessary data analytical and advanced power systems engineering skills, knowledge and experience for action 2.

Network simulations: In RIIO-ED2 the production of LV forecasts using the ATLAS methodology from increased access to aggregated smart meter data and LV monitored data will enable us to run simulations on our entire LV network. We will use the network simulations to forecast when and what intervention options could be used to maintain continuity of supply to our

customers. Advanced modelling like this requires new data science and data analytical skills and tools which we will start to develop and/ or acquire in the latter part of RIIO-ED1, in preparation for RIIO-ED2. Combined with our heatmap data the simulated network modelling results will be published to promote the provision of energy efficiency and flexibility.

Data and data-sharing: Throughout RIIO-ED1 our customers and stakeholders have had access to our GIS system which shows the location and size of network assets on a map background. Examples of GIS use include:

- Asset location for safe digging practices by other utilities and public entities
- Facilitating competition in connections by ICPs, IDNOs and engineering consultancies
- Research projects managed by consultancies or universities.

In line with the recommendations of the Energy Data Task Force, our approach to data and data-sharing will be enhanced as we adopt a presumed open approach, unless confidential or commercially sensitive, meaning that we will share significantly more data in RIIO-ED2 than in RIIO-ED1.

We intend to progressively collect and share regularly the following datasets as defined in the ENA data catalogue, with each decision being guided by the DSO Stakeholder Panel:

- Geospatial visibility of our infrastructure assets and heatmaps for all voltage levels
- Historic operational data
- Near and longer-term forecasts (from our active network management system (ANM) and DFES respectively)
- Network planning data, including network connectivity models, electrical characteristics and loading data, to perform power system analysis.

Initially this will only be available for EHV (ie 132kV and 33kV) and HV networks, but by the end of RIIO-ED2 it will be provided for all network levels with additional data granularity available on request. Data will be provided in CIM or standard CSV or MS Excel workbook formats, allowing users to manipulate the data to their requirements. Network models will be in a standard interoperable format that will allow users to overlay our system data onto their data and facilitate network analysis.

Stakeholder feedback from our DSO consultations, published in summer 2020, told us that we needed to publish our data both on our website and on industry-wide data-sharing services or platforms. So, in RIIO-ED2 we will provide a data portal, accessible via our website that enables customers, stakeholders and other interested third parties access to either:

- Download our published data, or
- Where practical visualise it, using a visualisation tool for greater insights.

APIs will also be available to allow data-sharing services/platforms to retrieve and host Electricity North West published data.

LV heatmap case study

In RIIO-ED2 our standard LV heatmaps will show the current utilisation of the network, using maximum/minimum demand values and known (or assumed) asset ratings. They will be updated quarterly, with the maximum/minimum demand date stamped to indicate whether there is seasonal fluctuation. We will provide greater granularity of utilisation to third parties on request, from half-hourly data, where available. We will generate equivalent HV heatmaps by aggregating the data sourced from the LV network, allowing full coverage of the entire secondary network. These heatmaps are an important means to obtain early sight of potential network constraints. If visualised for our distribution services area they provide a regional view of our needs. We will use heatmaps to identify and signal a potential intervention need; for example, an early indicator of our requirements for energy efficiency and/or flexibility.

In RIIO-ED1 we supported the development of the Flexr data-sharing service, created by ElectraLink. Through the Open Networks Project, we have raised and supported the raising of modification proposals in Grid Code, Distribution Code and DCUSA for data-sharing between multiple licensees or between licensees and stakeholders.

In RIIO-ED2 we will establish an ICCP (Inter-control Centre Communications Protocol) link with the ESO to facilitate bilateral exchange of real-time data. This will enable efficient operation of both networks and maximise information access to both networks avoiding situations where an action causes an adverse impact on the adjoining network. We will communicate to the ESO the operating state of our ANM system, along with real-time limitations and flexibility dispatch criteria from our merit order management (MOM) system. Similarly, we will receive real-time dispatch, energy flow and network connectivity status as inputs to our network management and ANM systems. This functionality will be extended to other adjacent or embedded network/system licensees as required. Where we have boundary points between the distribution and transmission network we will share reactive power forecasts with the ESO to facilitate them making informed investment and control decision making processes. This data will be shared in CIM formats utilising dedicated communications links. The development of our NMS, ANM and MOM systems is explained in [Section 5.2](#) with the timeline shown in [Section 9.4](#).

Subject to appropriate data triage, to protect confidentiality, we anticipate we will initially share the following:

- Demand/generation forecasts
- Network outage programme
- Curtailment index forecasts, and
- Anticipated MOM dispatch.

A more detailed view of the operational data we expect to share appears in [Section 5.2](#).

Data visualisation: As well as the data being available to download via our website in ED2 we will provide a simple and easy-to-use visualisation tool. Currently not all our stakeholders have access to the appropriate tools to analyse and visualise our data and to generate insights. We want this data to be available to all our stakeholders to help them on their decarbonisation pathways. Initially we expect our customers and stakeholders to be interested in gaining insights on three main categories of data:

- Our forecasting data from DFES
- Asset-related data across all voltage levels, and
- Constraint forecasts.

Network planning: In RIIO-ED1 we will publish alongside our first Network Development Plan a planning methodology statement that explains the end-to-end process from forecast to decision-making. It will provide greater clarity and transparency on how our networks are planned. This document defines the analysis methodology and process in compliance with the licence obligation and national standard, EREC P2. In RIIO-ED2 we will refresh and upgrade our network planning tools and share our single network model and electrical characteristics and parameters using CIM protocol to all network and system licensees through their chosen medium.

Identifying network needs: Since 2018 we have published an annual DFES document and a bi-annual regional insights document which visualises the impact on the current network of the projected forecast demand for the periods 2023, 2030, 2040 and 2050. These provide an early indicator of potential network need. Alongside the 2019 and 2020 DFES we included a MS Excel workbook containing all the forecast data, the first DNO to openly publish all the forecast information. These publications only included data for the primary substations and bulk supply points on our network. As usage data for HV and LV networks becomes readily available from a combination of aggregated smart meter data and monitoring data, we will disaggregate the forecast data down to HV and LV network level. We expect that this level of granularity of data will be used by local authorities when developing their Local Area Energy Plans.

By the end of 2025 we will publish annual DFES forecasts and heatmaps at all voltage levels, including the entire LV network level. We will publish regularly information on where there is either a potential network constraint or available capacity. To show our approach is transparent and open to review we will publish a methodology statement describing the processes we follow for identifying network needs. The key milestone dates are detailed in [Section 9.4](#). Further information on how we will obtain 100% network coverage by the end of RIIO-ED2 is contained within Annex 4, our Network Visibility Strategy document.

Identifying mitigating options:

The main options for intervention are:

- Procurement of flexibility services
- Network reconfiguration and/or voltage control
- Delivering an energy efficiency programme
- Innovative solutions, and
- Network reinforcement.

By determining the cost of the most efficient traditional reinforcement option we provide the counterfactual for any assessment for the alternatives. The network planning processes to identify the asset intervention solution are done in parallel to developing the alternative solutions. To ensure that our approach is transparent and open to review, we will publish a methodology statement describing the processes we follow for identifying solution options for each network need. We will also look for strategic network interventions that consider cost efficiencies and risk mitigation across larger areas and allow us to avoid piecemeal expansion of the network.

Increasing solution options: Positively engaging with as many solution providers as possible in all our decisions is key to our strategy of delivering efficiencies for customers. In RIIO-ED2 we will engage the help of others to find new solutions to our network issues, thus ensuring that we have the widest range of options possible for evaluation and adopt the most suitable economic approaches. We will publish information on all network constraints to encourage potential solutions from all parties eg flexibility providers, customers, Electricity System Operator (ESO), Transmission Operators (TO), other Distribution Network Operators (DNO) and Independent Distribution Network Operators (IDNO), and groups such as local or community energy groups. This holistic approach would, for example, allow a community energy group to bring forward a proposal for an energy efficiency programme in its locality to solve a network capacity need. Working with other energy vectors and local authorities will be a key part of developing whole system outcomes through the planning process.

Flexibility: In 2018 we made the commitment to adopt a ‘flexibility first’ approach and, as part of our pledge to develop flexibility, we agreed to seek flexibility services for every proposed network reinforcement project. Initially we applied a contestability test of “Is the reinforcement requirement greater than 200kVA and greater than £200,000?” and if so we ran a tender to determine if it was economically feasible to use a flexibility solution. Each time we ran a tender we learnt more about the requirements of flexibility providers to evaluate our needs. As a result of these learnings we now provide a time series dataset of our requirements; we allow variable contract lengths and allow tender respondents to define their payment terms. In 2019 we reinforced the flexibility first approach by signing up to the commitments of the ENA’s ‘Our six steps for delivering flexibility services’ statement. Throughout RIIO-ED1 we used the contestability test for all thermal constraints as identified through the annual load index evaluation and DFES forecasts.

Figure 5.2: Potential future uses of flexibility in network operations

Planned	<u>Maintenance or construction outages</u>	Load related reinforcement	<u>Energy efficiency programme</u>
	<u>Storm events</u>	<u>Connections driven reinforcement</u>	
Reactive	<u>Plant disruptive failure</u>		
	Short term	Long term	

As set out in [Section 5.3](#) market development, in RIIO-ED2 we intend to expand the set of circumstances where we procure flexibility. For example, shorter term procurement for disruptive failures and outage planning and longer-term procurement for connections driven reinforcement as shown in underlined text in [Figure 5.2](#).

In RIIO-ED2 we will remove the threshold values for the market testing of flexibility, as the success of tenders increase, and the market develops. However, as [Figure 5.3](#) shows we are not able to use flexibility to mitigate the need for asset intervention in some of the constraint categories, so there will still be a need to use traditional asset based solutions in some instances, but even in these cases we will still seek to innovate to develop the most efficient solution.

Figure 5.3: Network constraints and potential to use flexibility

Network constraint category	Potential to use flexibility
Fault level constraint	No
Power quality (voltage, harmonics) issue	No
Protection	No
Non-compliance with EREC P2/8	Yes
Thermal capacity constraint or voltage exceedance	Yes
Thermal limitation in neutral conductor	Yes
Voltage step change	No

Assessing options: Electricity North West pioneered the development and introduction of the Real Options CBA (ROCBA) methodology in RIIO-ED1; this tool is used to compare different investment strategies considering all five DFES scenarios. This allows us to quantify the impact of each strategy to ensure that the most cost-effective solution to a capacity or network health issue is reached.

The ROCBA model was originally developed with the intention of comparing traditional network reinforcement strategies against innovative demand side response solutions to address network capacity issues. However, the model is also now being applied to asset replacement schemes to determine the most cost-effective replacement option (e.g. replacement transformer and/or cables), while also ensuring network capacity needs are met for the affected customers. For example, ROCBA assists with the decision to install the same size or larger or smaller assets. This further application of the model has greatly expanded its reach and usefulness within Electricity North West and ensures that a consistent methodology is applied to all aspects of network investment to bring the greatest benefits to our customers.

In RIIO-ED1 Electricity North West led the development of the Common Evaluation Methodology (CEM) and tool within the Workstream 1A of the Open Networks Project in collaboration with other DNOs and supported by Baringa. The CEM builds on much of the learning from the ROCBA model, and similarly is based on the Ofgem CBA model. The CEM and tool are available on the ENA Open Networks Project website. In ED1 the governance arrangements for the CEM will be managed as part of the Open Networks Project and all modifications will be consulted upon with stakeholders. It is expected that the CEM Tool will identify and account for the option value.

In both RIIO-ED1 and ED2 periods we will use the CEM tool for evaluating all innovative solutions against traditional reinforcement, but particularly for flexibility. We will supplement the CEM analysis with ROCBA where it facilitates the comparison of additional parameters or provides greater granularity e.g. network losses. The outcome of each flexibility tender round will be published on our website following each event, with the accompanying analysis and an explanation of the chosen intervention. Note, where it is not possible to fully evaluate options using either of these assessment tools we will use the Whole System CBA developed within the Open Networks Project.

Stakeholder involvement: In their response to our DSO strategy consultation, our stakeholders told us that they would like to be involved in the ongoing publication of data. In RIIO-ED2 we will be guided by our DSO Stakeholder Panel on what data, including third-party data, we should use in our forecasting and simulation modelling and what data we should share with our customers and stakeholders.

In RIIO-ED1 we started publishing all our supporting models alongside our decisions for information. To further improve transparency in RIIO-ED2 we will introduce two additional checks for our customers and stakeholders to challenge our proposed decisions:

- We will introduce a 10 day standstill period after publication of decisions and prior to entering into contract with the successful tenderer(s). This will allow a period for scrutiny and challenge of our proposed decision, and
- We will introduce a decisions review process to ensure that any decisions that are challenged are independently reviewed by our DSO Stakeholder Panel. The panel will have the power to recommend the proposed decision is overturned if the process has not been followed correctly or any relevant factors have not been considered. In addition, if the decision-making process

itself is found to be flawed the panel will be empowered to review the methodology and make recommendations to modify it.

These transparent processes coupled with oversight by the DSO Stakeholder Panel provide the opportunity for any party to scrutinise our decisions. This is particularly important for licensees involved with DSO functionality where they are evaluating and choosing between a range of potential solutions from multiple parties, one of which will be the DNO. We are confident that we have set out a clear and transparent process with the appropriate checks and balances that provides assurance we are taking the right decisions, including where a DSO party may choose a service from the DNO (eg CLASS).

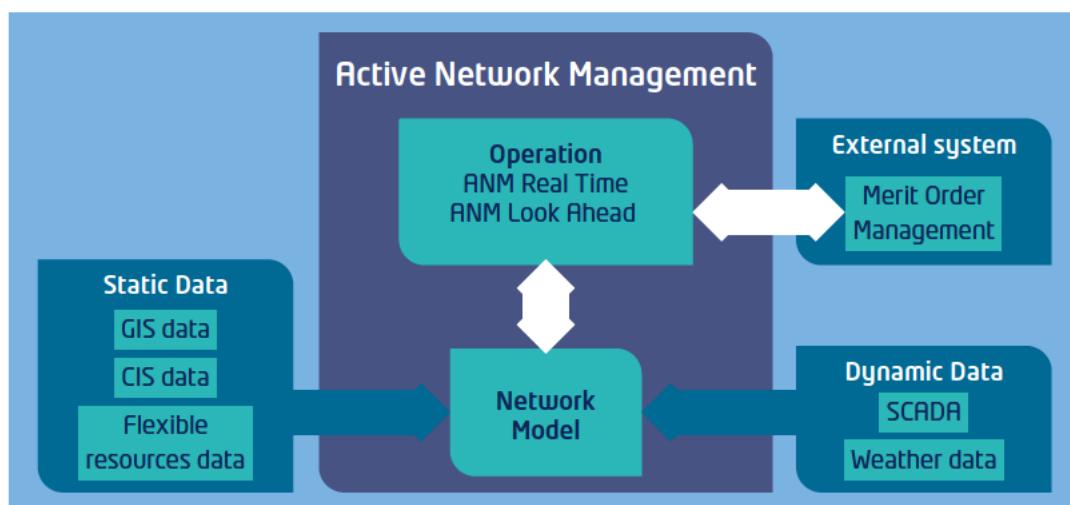
5.2. Role 2: Network operation

In RIIO-ED2 we will refresh our network management tools and techniques with the introduction of an active network management system combined with a unique and fair approach to curtailment based on our curtailment index to operate a smart and flexible distribution system. Sharing of real-time operational data with other system and network licensees will enable the delivery of whole system outcomes. A timeline for all these proposals is detailed in [Section 9.4](#), whilst the actions, initiatives and deliverables for role 2 are mapped to the baseline expectations in [Section 9.5](#).

Visibility of network utilisation: As explained in [Section 5.1](#), we already publish heatmaps for our 132kV, 33kV and HV networks which are published in accordance with the industry standardised best practice guides developed as part of the Open Networks Project. By the end of 2025 we will extend these heatmaps to cover the entire LV network.

Active network management: In RIIO-ED1 we implemented a new network management system (NMS) produced by Schneider Electric and with their assistance have developed and will deliver a new active network management (ANM) system. Our ANM system (see Figure 5.4) is made up of two core components. The first component is the system which carries out network modelling activities in real-time to manage network constraints utilising flexible network assets, flexible connections and flexibility services. The second component is the merit order management (MOM) system. This system holds contractual data for all flexible connections and flexibility services which the ANM system can send dispatch signals to request a change in the site's import or export. Our ANM system has been built to directly integrate with our NMS so will hold real-time data for the network topology, running arrangements, metering data and other system monitoring devices. The MOM system will send a merit order list to the ANM system on a regular basis which determines the order in which flexible resources are to be dispatched, when the ANM system has detected a network constraint. When we implement ANM in 2022 we will publish a methodology statement describing how the ANM system executes the merit order, dictated by the MOM system. In RIIO-ED2 this statement will be reviewed annually with stakeholders and updated as required.

Figure 5.4: Active network management



also be assigned a curtailment index. It is envisaged that some legacy sites may choose to sign up to flexibility bilateral trading or may wish to alter their connection agreements to make savings on their electricity bills by accepting a flexible connection agreement; these sites will also be enrolled into the curtailment index system. The curtailment index system provides a safety net for customers with flexible connections which will protect them from being excessively curtailed by manual and/or automated control processes.

Integration of Innovation: Throughout RIIO-ED2 we will be transferring the learning from innovation trials. RIIO-ED1 has already seen us convert the learning from projects such as Smart Street and CLASS into business as usual applications, with further co-ordination of these voltage management schemes being developed through the QUEST project. We will incorporate the learning from projects, such as ENWL's Celsius and SPEN's Dynamic thermal rating of assets projects, into our new automation tools to maximise network utilisation. The TRANSITION project is anticipated to provide valuable learning relating to developing and actively managing flexibility markets, including secondary trading. ENWL has partnered with SSEN to ensure that the insights from this project can be applied across multiple distribution networks. As RIIO-ED2 develops we will continue to innovate, as well as monitor other innovation projects and trials so to continually improve the network we operate.

Flexible connections and curtailment index: Since December 2017 all distributed generation connection offers greater than 200kW, and non-firm demand connections greater than 200kW, are provided with a curtailment index in their quotation. The aim of the curtailment index, developed in response to stakeholder feedback in RIIO-ED1, is to provide assurance to network users that the network will be available for use for an average time per year. We publish a curtailment index per voltage level which is presented as the percentage of time that the network is unavailable. To determine the curtailment index, we consider all the scenarios when the system is abnormal and unavailable, for instance during faults, construction, and maintenance outages. The actual curtailment experienced by the customer is monitored, and if this level approaches or exceeds the index value we will investigate and potentially seek to intervene. Network users with a curtailment index will receive an annual review letter, providing the curtailment experienced over the previous year. The 'actual' curtailment is calculated based on a six-year rolling average; further information on the curtailment index is published on our website. Any new site being connected to the network which has a flexible connection will be assigned a curtailment index, to allow it to be incorporated into the ANM system; legacy sites already connected to the network which already have the facilities to operate flexibly will

Our stakeholder engagement has shown that this is a key initiative to enable confidence in the operation and risks associated with flexible connections.

Merit order management: In RIIO-ED1 we implemented the standalone MOM system to generate the curtailment list or merit order for all potential constraints within a defined ANM zone. The merit order is determined using our unique curtailment index approach. The curtailment index ensures fairness through equal use of assets connected via flexible connection arrangements. This is fairer than the current alternatives of LIFO (Last In First Off) and shared utilisation, as the order of curtailment is defined by the current level of curtailment for each network user. Utilising this approach ensures that customers are not negatively affected by the use of the ANM system, as curtailment should not exceed the pre-agreed thresholds.

To allow for the unbiased deployment of flexibility solutions, all procured flexibility services are contained within the same merit order list. For further information see Managing curtailment and flexibility services together below. As flexibility services and flexible connections need to exist in the stack together, we need to assign the right values to rank them in the best order. It is envisaged that we will assign a pseudo price for the curtailment index in £/MWh which then can be compared to a flexibility service measured in £/MWh. The value of curtailment can be configured in the MOM system providing a transparent way to value flexibility services against constraints. This value will be defined with input from our stakeholder population, to rank curtailment fairly against procured flexible services.

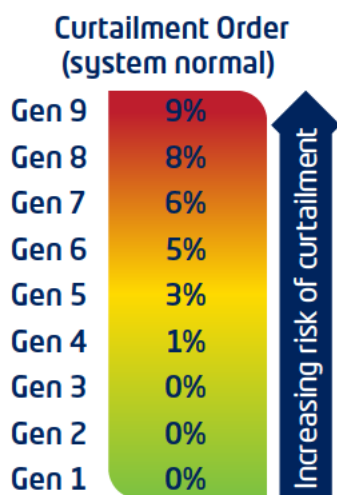
The MOM system has been developed as a standalone system so that it is ring-fenced from other DNO activities. This allows interface with other systems or platforms future-proofing it against any commercial developments as the scope of DSO evolves. In RIIO-ED1 we will develop the MOM solution to facilitate secondary trading, including the trading of curtailment liability by interfacing with platforms that perform this functionality. Timelines for this are detailed in [Section 9.4](#).

Transparent decision-making:

Figure 5.6 shows a curtailment list/stack or 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.

For each potential constraint identified within an ANM zone by the ANM system, the MOM system will provide a stack. This means that if there are multiple constraints within an ANM zone, network users may appear in multiple stacks or lists. Where a site's curtailment index rating is reduced following a curtailment action, the ANM system will report this action to MOM and it will re-evaluate all flexible resources across the lists to ensure that the site with the highest curtailment index is at the top of the merit order list.

Figure 5.6: Merit order list



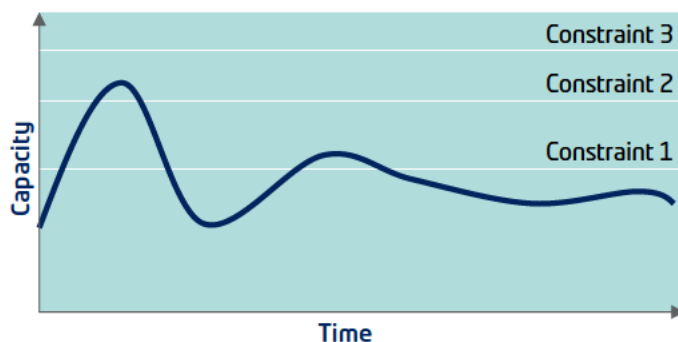
Defining curtailment order:

A network user's order within the curtailment list is based on their current curtailment value when compared with each connected network user behind the constraint. The curtailment value is adjusted dynamically to reflect any network event or activity that causes the DER to adjust its import or export. Each DER controlled by the ANM system will be assigned a curtailment index rating. These ratings will be assigned based upon the voltage of connection. Our curtailment methodology was consulted upon in our [DSO 2020 strategy](#): where our stakeholders were unanimous in their support of the use of the curtailment index approach over other curtailment methodologies. We will publish the methodology for the generation of the curtailment stacks on our website for anyone to review when ANM goes live in 2022; and in RIIO-ED2 it will be subject to review by the DSO Stakeholder Panel.

Sharing curtailment information: When ANM goes live we will 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. These milestones are shown in the transition plan in [Section 9.4](#).

Sharing a user's curtailment information: With input from network users, an information-sharing screen will be developed and made available to each DER owner connected to the ANM system. Figure 5.7 shows the anticipated demand profile of the site, in relation to any constraints which might impact the DER site. Each DER site will be able to access this data via a password protected interface which will show only data which is relevant to their site. This facility will graphically represent a view of the likelihood of the site being constrained and by what magnitude during the upcoming period. The data presented is based upon historical data of network demands, predicted generation outputs, weather data, site position in the merit order stack, existing flexibility services contracts and known planned network switching events.

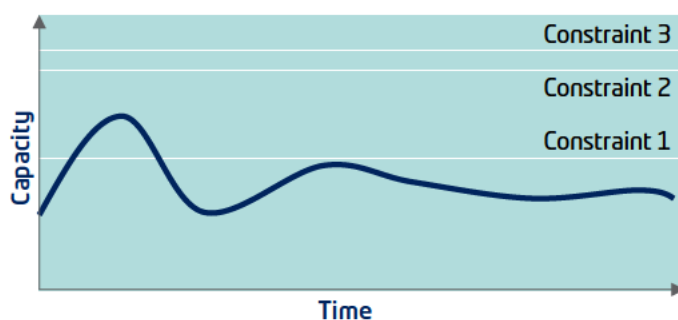
Figure 5.7: DER constraints look-ahead example 1



In this example the site's output is anticipated to exceed both constraints 1 and 2. For these periods the site could look at the risk to their business of these constraints being applied. This could either drive them to modify their own onsite behaviours to mitigate the risk or look at carrying out curtailment liability trading or some form of secondary trading to allow them to reduce the risk of being constrained in the first instance.

Figure 5.8 shows an example of how a site could utilise this information to reduce the risk and magnitude of constraints. The site has carried out trading to move the magnitude of constraint 2; this could have been contracting with another site to offset their demand or trading their risk of curtailment. By carrying out this action they have managed to completely remove the risk of being constrained for the conditions creating constraint 2. They have also modified their demand profile to decrease the amount of time their site demand is within the constraint 1 boundary.

Figure 5.8: DER constraints look-ahead example 2



Publishing constraint information: We also publish the individual merit order lists for each ANM zone, which includes information on the constraint. 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, at 11kV an ANM zone is generally made up of a single primary substation. [Figure 5.9](#) shows a representation of how an ANM zone is defined within the ANM system; each ANM zone has a different colour.

Facilitating curtailment trading: The aim of sharing merit order information with each flexible connectee is to help them identify their curtailment risk in advance, so that they can evaluate the impact on other contractual obligations e.g. provision of flexibility to other parties such as the ESO or suppliers. In addition, in conjunction with our introduction of bilateral trading, it affords them

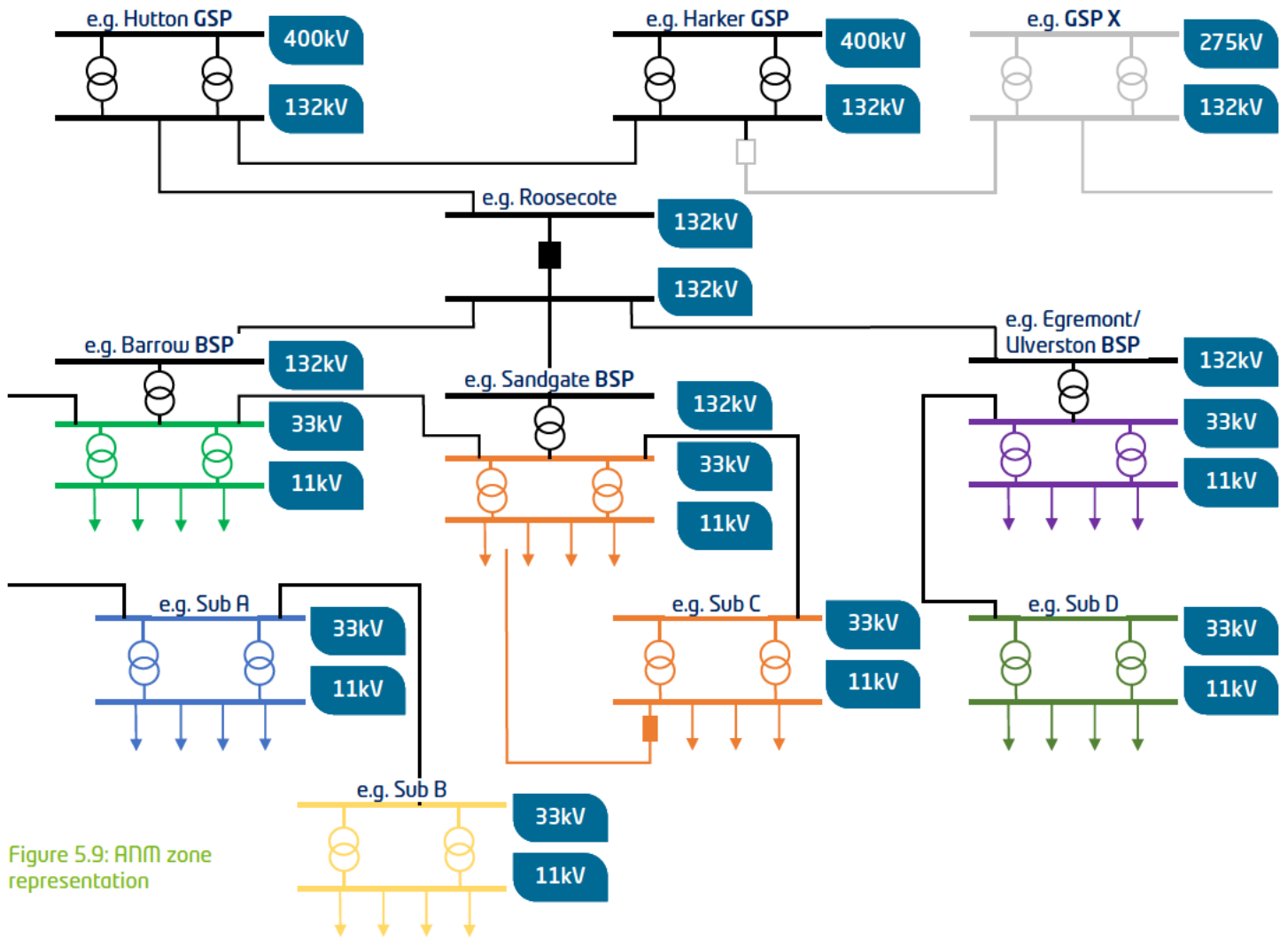


Figure 5.9: ANM zone representation

the potential to trade away their curtailment liability with others in the stack or trade to accept additional curtailment risk in return for financial reward. Initially it is expected that there will be few trades and so in late RIIO-ED1 we expect to facilitate these trades through a broker-type service offered by Electricity North West, acting as a neutral market facilitator i.e. a user will ask us to find a willing trading party.

In RIIO-ED2 we will move to a platform-based marketplace to facilitate direct bilateral trading of curtailment risk, which will reduce the friction of trading curtailment and any associated transaction costs. In addition, we will offer to share the merit order information with all network users behind each constraint via an opt-in process to increase the volume of potential trading parties. In 2021 we submitted a Network Innovation Competition proposal called BiTraDER to undertake a project to develop the trading rules and functionality to deliver curtailment liability trading. If successful, the solution will be implemented as business as usual in RIIO-ED2. But we will also add facilitating curtailment trading requirements within our flexibility services marketplace requirements and tender at the same time.

Following discussion with our customers and stakeholders we believe these measures are essential to improve flexibility market liquidity and delivering optimum whole system benefits. We believe that when presented with their curtailment risk information, our customers will make rational economic decisions considering their curtailment liabilities and obligations in the energy or ancillary services markets.

On the basis that other system and network licensees could benefit from having our curtailment information we will provide access to real-time data, on request, via ICCP, where appropriate, with a sufficient level of granularity to allow them to cross-reference against their own service provisions i.e. MPAN/MSID. In sharing data to this level of granularity, other relevant licensees can satisfy themselves that co-ordinated conflict management or primacy rules are not necessary, and distributed energy resources will be able to stack revenues for their flexibility services.

Support of DER in co-ordination with the ESO: We are keen to work with the ESO to support DERs to establish connection to the network and then be able to operate and participate in flexibility markets. Through the work we are currently undergoing via the ENA Open Network Project, WS1A P5 (Primacy rules), we are looking to remove barriers to entry caused by network conflicts; such as DER operating within ANM controlled zones which are contracted to deliver flexibility services to the ESO. Through the publication of forecast future curtailment information, as well as facilitating curtailment trading we are offering DER operators and the ESO the opportunity to understand potential service conflicts and to mitigate any subsequent impacts on procured services. Curtailment forecasting will be made up of both DNO restrictions, as well as information provided from the ESO; this will help to give a whole electricity system curtailment forecast for DER operators.

We continue to work with the other network operators as well as the ESO to provide support to DER owners and operators, standardising and developing best practices; working together to reduce stakeholder fatigue whilst developing these processes and procedures.

Managing curtailment and distribution flexibility services together: Flexible connections are combined with the relevant distribution flexibility services procured for the anticipated service requirements within the merit order list. Figure 5.10 shows where we would seek to purchase flexible services and Figure 5.11 shows the combination of flexible connections and flexible services. Flexible services are often procured in advance to secure against a specific level of perceived network constraints. However, this does not exclude them from being purchased a day or even hours in advance should the need arise. For example, our short-term constraints-forecasting application may identify that there are not enough flexible resources available to manage the constraint and so we would go to the market to buy flexibility from network users behind the constraint. This facilitates competition for flexibility as anyone behind the constraint could opt to provide flexibility, including network users whose curtailment index has already been used up for the year. This forecasting application 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 and maintenance periods and pre-scheduled flexible services.

The ANM system will utilise all resources which are available to it to resolve network constraints in the sequential order of the merit order list. As such if an N-2 fault occurred the ANM system will first dispatch all of the category 1 assets, and then the category 2 assets prior to dispatching the category 3 assets.

Figure 5.10: Flexible services alongside flexible connections

EREC P2/7	System normal	N-0	Procured services to manage Pre-fault	Buy: SUSTAIN SECURE
	System abnormal	N-1, N-2, N-3	Procured services to manage Post-fault	Buy: RESTORE DYNAMIC

Figure 5.11: Merit order categorisation

Category	Network status	Flexible resources within the merit order list
1	System normal	Unfirm and constrained connections for normal running arrangements (N-0) Pre-fault flexible services (Sustain, and Secure)
2	System abnormal, N-1	N-1 Unfirm connections for any abnormal running conditions Post fault services for N-1 conditions (Dynamic, Restore)
3	System abnormal, N-2	Firm connections for first abnormal running condition (N-2) Post fault services for N-2 conditions (Dynamic, Restore)
4	System abnormal, N-3	Firm connections for second abnormal running condition (N-3) Post fault services for N-3 conditions (Dynamic, Restore)

Note, a single site can hold multiple entries within the merit order list if it can provide multiple elements of flexibility. Sites can provide both demand/generation turn-up and turn-down flexible services, as well as holding a flexible connection which can have multiple intricate elements.

Facilitating trading of distribution flexibility services:

In RIIO-ED2 we will extend the provision of merit order and constraint information to all network users to facilitate the trading of curtailment risk and other Distribution Flexibility Services.

To facilitate trading there is a need to define four elements:

- Transparent information sharing between parties
- Ability to maintain network continuity
- Visibility of potential trading opportunities
- Transparent trading arrangements.

Sharing information with each network user behind a constraint allows them to see their position in the stack relative to other network users and enables the network user to consider the opportunities to enter into an agreement with another network user to accept their curtailment liability; this fulfils the first element of transparent information sharing.

Potential participants will need to be able to determine what opportunities for trading are available from other parties under the same constraint. So, to comply with data privacy and confidentiality, network users will need to 'opt in' to secondary trading. Only after they do this will they have visibility of their stack information and potential trading parties; this fulfils the third element of visibility of potential trading opportunities.

The parameters within which parties can trade need to be defined and published; for example, minimum trade duration and the period before real time that the trade must be complete. We will

publish the trading arrangements, fulfilling the fourth element of transparent trading arrangements. We are exploring whether we can classify the trades as simple or complex with simple trades requiring only notification and complex trades requiring our approval, so that, at all times, we are balancing the need to minimise the bureaucracy of trades with the need to maintain network continuity; thus, fulfilling the second principle. In our tender for a platform-based trading provider we will review the options currently due to be available for the start of RIIO-ED2.

Our approach to providing a merit order list to all network users and other system or network licensees enables coordinated actions to be managed and facilitates secondary trading.

We will keep under review our approach and provision of information and expect the DSO Stakeholder Panel to assist with defining the data shared with network users, between Electricity North West and other system/network licensees and post-event trading information.

Third party provision of MOM: A standalone MOM system was developed for two reasons:

- for flexibility of approach, as Electricity North West could develop and deliver the required functionality itself taking into consideration the best practice approaches in the industry, and
- it is separate from ANM so if required the decision-making tool could be managed by another party.

In RIIO-ED2 we will review whether it is appropriate for the MOM system to be managed by a third party.

DER information and unavailability: We have already started collecting data on the characteristics of each DER as part of our normal business processes supporting the Accelerated Loss of Mains Change Programme and publishing information as part of the Embedded Capacity Register (ECR). It is expected that we will publish more information as the threshold for inclusion in the ECR is reduced and the requirements extended through open governance as the need for additional data collection and sharing is uncovered.

Our flexibility services contract requires all providers to signal unavailability for any services they are contracted to provide. Unless a site is declared unavailable we will work on the basis that when requested to dispatch a service the provider will be able to do so. Failure to deliver a service is managed through a percentage of over-procurement. In RIIO-ED2, as we will be more reliant upon flexibility services, the risks of DER failure to deliver will become more critical and we will need to consider the use of over-procurement to ensure that we can maintain a safe, secure, reliable network. The choice of how much we choose to over-procure will be determined using our ROCBA model/CEM tool which will weigh up the cost of a service compared to the risks and impact of service failure.

Dispatch: ANM has been designed to execute dispatch command orders as prescribed by the MOM system. For network monitoring purposes most DER sites already have an Electricity North West-owned remote terminal unit (RTU) onsite; only for flexible connections will the RTU be used for delivering control signals to the site. To facilitate competition in the provision of flexibility, ANM will be configured to signal an API which then passes on the instruction;

this facilitates the business development of aggregators and provides an alternative dispatch method for purchased flexibility.

Developing the skills for a successful DSO delivery

A successful transition to DSO will be delivered by motivated and skilled personnel across a number of teams within Electricity North West, not just by the DSO team. We expect to face lots of new and exciting challenges as we perform the new functions within network operations, managing flexible connections and securing flexible resources to assist managing the network will challenge the DSO and Control room teams.

A service dispatch requirement is communicated via the API, which is interpreted by the flexibility provider's control system. In the case of an aggregator further dispatch signals are issued to their contracted resource providers to provide the service Electricity North West has requested. Only where the customer does not want to use an API solution or where the speed of response dictates that we should have faster communications and an RTU is recommended, will we consider offering an RTU solution to the customer wishing to provide flexibility services; but it is expected that these will be rare occasions. When we implement ANM in 2022 we will publish a methodology statement describing how and when we will dispatch flexible connections and distribution flexibility services using ANM and how we see these changing over time as the market matures and we reduce our reliance on hard wired controls. In RIIO-ED2 this statement will be reviewed annually, with network users and other interested parties, and updated as required.

Standardisation: In RIIO-ED1 we were a staunch supporter and significant contributor to the work of the ENA Open Networks Project. This project delivered a significant body of evidence for the DSO transition and contributed to the standardisation of products and processes through best practice guides. This type of engagement and coordination needs to continue with other GB system and network licensees to deliver standardisation and whole system outcomes. We will continue to promote the industry standardisation work through ENA-led initiatives, like Open Networks.

Continuous improvement: In RIIO-ED2 we will publish an annual report on our progress towards DSO transition. Targeted at our stakeholders it will show how we are delivering against our commitments in each of the DSO roles, activities and baseline expectations. This will be in addition to the annual regulatory reports detailing our yearly costs and performance metrics.

Sharing network data: As explained in [Section 5.1](#), as part of the Open Networks project in RIIO-ED1, modification GC00139 was raised to facilitate the exchange of enhanced planning data for whole system outcomes between DNOs and the ESO. This enables the sharing of network topology, configuration information, and loading information in a standard interoperable format based on the IEC Common Information Model (CIM). We will develop our capability in RIIO-ED1 to extract network data from our core IT systems and convert it to CIM format for use internally and sharing externally. In RIIO-ED2 we intend to develop the CIM standard, in conjunction with the other DNOs, into a standard suitable for the description of distribution networks down to the low voltage level and make these datasets available.

Sharing this network and heatmap information via the data repository will allow:

- Network users to make better decisions about how to use the network
- Flexibility providers to understand potential opportunities for their flexibility services, and
- Indicate where we have capacity available on our existing network.

We expect to share the operational data shown in Figure 5.5 overleaf.

Figure 5.5: Operational data to be shared with ESO and other licensees

Boundary data	Data from monitoring points where the two networks meet. ICCP is used to share this data so that both parties can utilise it in their own control decisions, as recorded historic feeder MW/MVA utilisation and calculated headroom/footroom
ANM data	Data relating to the real-time operation of the ANM system eg which areas of networks are defined as an ANM zone, data on the levels of constraints being applied to network connections, underlying demand etc. Utilisation and curtailment of areas under the control of capacity management systems such as ANM systems
MOM data	Data related to order of curtailment of flexible connections within each defined ANM zone providing visibility of the dispatch schedule
Losses data	Data relating to network losses which will be calculated utilising multiple measuring points at the different voltage levels. This data will rely on establishing sufficient granularity of network monitoring at all voltage levels, and the results will be subject to the combined accuracy of the measurement points. Initially this data will be calculated retrospectively
Distributed energy resources data	Data related to the mix and levels of distributed generation that will allow the ESO to carry out risk analysis for changes in generation outputs relating to varying weather patterns, estimations of the carbon dioxide emissions content of the energy mix, and any potential risks relating to the operation of protection devices associated with transmission level changes to network frequency and voltage
Planned and unplanned outage data	<ul style="list-style-type: none"> • Data relating to planned network outages • Data relating to un-planned network events affecting both parties. ICCP link can also be used for national transmission-related un-planned events e.g. low frequency demand disconnection, or black start events to allow our control room to get updates on restoration plans
Systems failure data	Data relating to issues associated with the ANM system/communications failures
Intertripping data	Data on operational intertripping, an ICCP link to provide this capability depending upon the speed and reliability of communications and the nature of the intertripping service required

We will share short term capacity headroom at boundaries to adjacent DNO or embedded IDNO networks to promote efficient use of network and decision making and seek reciprocal information. This will provide sufficient information to neighbouring DNOs and IDNOs to enable them to consider how energy may be utilised within their own networks and foresee any potential constraints which may occur at boundary points. Neighbouring network operators may be able to offer support to prevent constraints from occurring by operating their own networks differently. This will also facilitate neighbouring networks to utilise a greater level of capacity when there are no forecasted network constraints on the ENWL network. We will seek for these data flows to be reciprocal to facilitate us to operate our network in the most efficient manner. We will continue to work with other system/network licensees, through the ENA, to ensure our approach to data-sharing, common data formats and what data we share is

aligned with industry best practice. Further information on how we will use network monitoring for operational purposes is contained within Annex 4, our Network Visibility Strategy document.

Utilisation of third party data sources: In RIIO-ED1 we have a limited number of sources of third party data which are utilised in operational decision-making processes. These sources of data tend to be linked to data relating to weather conditions impacting the network. Within RIIO-ED2 it is anticipated that we will be utilising a much wider range of third part data sources to dynamically control the network, as well as to keep our stakeholders informed.

Smart meter data and alerts will be utilised to guide decision making made within the control room and out in the field. It is hoped that once the accuracy and quality of the data we receive has been verified that this data can be integrated directly into

network automation systems, such as ANM. In the short-term data such as voltage monitoring will be integrated into automated network control systems such as ANM and Smart Street in order to optimise the networks operating conditions and to ensure that all statutory voltage limits are maintained. In the longer term the utilisation of real time smart metering data, where this is available, will give us data on the consumption and generation profiles of our LV connected customers as well as information on network voltages, and power outage alerts. Some issues have already been identified with relying upon the data from smart metering; for example, power outage alerts which are generated following a customer's electrician removing the property's cut-out fuse, these do not correctly show that the customer's meter has lost supply however is not necessarily indicative of a ENWL power outage. In this example ENWL proposes to carry out a triage process which will utilise other smart meter data from other surrounding properties combined with ENWL monitoring data to confirm if a wide area fault within the ENWL network has occurred or if this is an erroneous power outage alert. This example does however highlight potential sites where the cut-out fuse has been removed by unauthorised personnel, this data could be used to develop training and enforcement programs to ensure that unauthorised personnel are not interfering with DNO equipment.

This highlights the importance that all data sources, and especially those from third party sources are triaged and their data verified as credible before integration into corporate systems and external sharing of this data.

As part of our work of leading the North West to Net Zero we are looking to provide an estimate of carbon dioxide emissions from the North West's electrical energy provided via the distribution network. We believe this will offer the ability for consumers to make informed decisions about how and when they utilise energy e.g. when they may choose to re-charge their electric vehicle to maximise the environmental benefits. To offer and improve estimations of the carbon dioxide emissions content of the energy mix, as described in Figure 5.5 within DER data, it will be necessary to gather and utilise third party data sets on different types of generation technologies as well as live data coming from other developed sources of emissions data.

5.3 Role 3: Market development

Our goal in RIIO-ED2 is to increase market opportunities and to create the environment for providers to maximise the value of their flexibility. The increase in operational data from HV and LV monitoring will multiply the flexibility and energy efficiency opportunities at these voltage levels as we develop a smart and flexible distribution system. We will encourage participation by clearly signposting opportunities, including amending processes to promote energy efficiency provision and by sharing our operational data so providers can see how to stack services selling their flexibility across multiple purchasers. We will promote competition and innovation in platform services to reach new flexibility providers, while reducing transaction costs, and open up opportunities for curtailment liability and secondary trading. A timeline for all these proposals is detailed in [Section 9.4](#), whilst the actions, initiatives and deliverables for role 3 are mapped to the baseline expectations in Section 9.5.

Flexibility services: Market development and liquidity

Even at the start of ED2 the flexibility market in the North West will still be a new and developing market. At Electricity North West we will increase the opportunities for participation as the new HV and LV monitoring equipment provides data on the utilisation and operation of the lower voltage networks by signalling potential areas of network need. With the introduction of our new network management and active network management systems we will promote flexible connections ensuring customers are curtailed fairly whilst assuring them a limit to their curtailment using our unique curtailment index arrangements.

We will continue to promote energy efficiency as part of our decarbonisation plans and provide examples and tips to domestic, business and commercial customers on how to be more energy conscious, as well as commissioning energy efficiency programmes to mitigate the need for network reinforcement. We expect to see domestic customers embrace low carbon technologies in the home, using mobile devices to control equipment while in and away from the home. We expect to see the continued rollout of smart meters with more suppliers innovating with new time-of-use tariffs to encourage flexibility to reduce and/or shift their energy use. New actors will enter the supply market and present customers with new ways to heat their homes and charge their vehicles in the most cost-effective and efficient manner.

All these changes are interlinked and will assist with the development of the flexibility market. As customers become more energy efficient and flexible in response to new technologies, the flexibility supply market will increase, and as the use of metering on the HV and LV networks grows, we will be able to signpost additional flexibility requirements, contributing to increased market liquidity and value.

Flexibility services: Standardisation and future governance

Flexibility services products: In RIIO-ED2 as part of the Open Networks Project we led the work to that describes the parameters and characteristics of flexibility products. We now have a standard for active and reactive power services currently identified and procured by network or system operators. We will continue to review the flexibility products that we tender for, to ensure that they meet the network and flexibility provider's needs. Any new products will be developed in collaboration with the other licensees and stakeholders through industry groups such as the Open Networks Project. Any additional products identified will follow the same parameters and terminology defined as part of the Open Networks Project. Other standardisation work on metering requirements and baselining methodologies completed as part of the Open Networks Project in ED1 will be encompassed within the existing product parameters and included in the schedules of the common agreements. This will further help to simplify and standardise the offerings of the GB flexibility market. Setting a standard enables potential providers to familiarise themselves with the requirements and encourages development of new services.

Flexibility service contracts: We were the first DNO to adopt the newly standardised common flexibility contract and the consistent branding of active and reactive power services, which demonstrates our commitment to standardisation and the simplification of information to help reduce barriers to participation and aid market liquidity. Using the standard contract means that there will be no exclusivity clauses in our contracts with flexibility providers.

Future governance: We will continue to work with our stakeholders and other licensees to establish appropriate open governance arrangements for the standard flexibility products and common contracts. The Open Networks Project has not yet developed the enduring governance arrangements for these outputs, such as flexibility products and contracts. All revisions have been implemented following extensive stakeholder engagement and legal support in drafting clauses and schedules. In RIIO-ED2 it is imperative that these standard products and contract documents are open to development to ensure that the services and the terms they are subject to are not exclusive and are standardised across all network and system operators. We will push for all ancillary and flexibility service products and associated contracts be defined in a future electricity network code, currently being considered under the Energy Codes Review. As chair of the Distribution Code Review Panel we are committed to delivering standardisation and providing clarity through codes for all network users.

Extended use of flexibility products: In ED1 we used procured flexibility to mitigate or defer the need for general reinforcement on the grid and primary networks. But we also developed the processes and procedures for using:

- Short-term flexibility for network constraints for planned outages and following storm events and disruptive failures of plant (ie purchasing Restore flexibility services removing the reliance on carbon intensive mobile generation), and
- Flexibility for connections-driven reinforcement or purchase of an energy efficiency programme

(as shown in underlined text in Figure 5.12).

Figure 5.12: Potential future uses of flexibility in network operations

Planned	<u>Maintenance or construction outages</u>	Load related reinforcement	<u>Energy efficiency programme</u>
		<u>Connections driven reinforcement</u>	
Reactive	<u>Storm events</u>		
	<u>Plant disruptive failure</u>		
	Short term	Long term	

In RIIO-ED2 we will embed these new processes and promote these use cases 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.

Comprehensive market information

Stakeholder engagement and engagement channels:

[Figure 5.13](#) shows the types and methods of stakeholder engagement we are using in RIIO-ED1. In RIIO-ED2 we will develop and consult on a stakeholder engagement strategy and plan for distribution flexibility services and the sharing of market information. The DSO Stakeholder Panel will oversee this process and endorse the strategy and plan, which will be regularly reviewed and refreshed to ensure that it is relevant, up to date and complies with the Data Best Practice principles. This will act as the guide for sharing data. As described in [Section 4.1](#) our DSO Stakeholder Panel, guided by our Electricity users in vulnerable circumstances strategy (Annex 8), will help shape our approach in the publication of data for existing and potential network users. We will be guided by the Panel to find and adopt best practice from other industries, testing that all our information and publications are easily accessible, comprehensive, including of a good quality as well as user-friendly. A key aspect of the testing is reviewing whether the data cleansing approach is fit for purpose and has delivered data and/or information of good quality. We will collaborate with other system and network licensees to ensure that wherever possible we are coordinated in our approaches to avoid stakeholder fatigue. In simple terms we will publish, wherever possible, any information that existing and potential network users believe is relevant for them, to understand and maximise their opportunities to provide flexibility services to Electricity North West and through the industry's standardisation, to any other party.

In RIIO-ED1 we have worked with our flexibility providers to understand and produce the information they need to assess our tenders. We have been open and transparent and published in easy to understand and simple to use formats, our future network needs, our detailed requirements for each of the flex services being sought and our evaluation of, and outcomes of, tender responses. We will continue to use our [dedicated flexible services webpage](#) as the primary source for our flexibility requirements and

all the associated information on flexibility services. For example, the website holds information on the products, procurement, dispatch and settlement processes including contracts, terms and conditions, evaluation methodology and publication of tender outcomes etc. We expect that all this information will also be available on our chosen platform providers systems. We will hold bi-annual workshops with flexibility stakeholders following the issue of each set of new flexibility services requirements and host regional events with local stakeholders where there is a concentration of opportunities. These sessions will be documented and circulated to all interested stakeholders and made publicly available via the flexible services website. We will continue to seek feedback quarterly on the usefulness of the information provided and how it can be improved. We will offer feedback surveys and opportunities for bi-lateral discussions, promoted in quarterly newsletters and via other stakeholder channels, to encourage participation.

Signposting future network needs: As described in Section 5.1, in RIIO-ED2 we will publish heatmaps for all areas and for all voltage levels of the distribution network where we have sufficient aggregated smart meter data and/or LV network monitoring data to show the utilisation of the network. We will re-issue heatmaps on a quarterly basis and publish this information on our own website, as well as distribute the information via other data sharing services through APIs. Through our flexible services webpages, the annual Distribution Flexibility Services Procurement Statement,

our quarterly newsletters and Network Development Plan we will highlight forthcoming tender release dates, indicating the need and type and range of services required, including early release of information for provision of energy efficiency programmes across longer time windows. We will target sharing this information with 1) aggregators, so that they can find, on our behalf, domestic customers to participate in future flexibility provision, and 2) local authorities and charities so that we can work together to plan and deliver energy efficiency programmes.

Publishing flexibility requirements: In mid RIIO-ED1 we adopted a materiality threshold for the market-testing of flexibility i.e. any network needs <200kVA and <£200k were excluded primarily because of the nascent market and the general lack of monitoring of HV and LV networks. In late RIIO-ED1 we will remove this materiality threshold as we will have greater granularity on the utilisation of HV and LV network from increased monitoring and aggregated smart meter data and we will have the means to share known hotspots of network issues from HV and LV heatmap data.

In RIIO-ED1 the industry standardised the issuing of flexibility requirements to take place bi-annually in spring and autumn, with any additional requirements published as and when identified. In early RIIO-ED2 we expect to see the number and timing of flexibility requirements continuing but we will keep this under review and if the volumes of HV and LV interventions warrant it we will increase the frequency, potentially moving to issuing flexibility requirements quarterly, like the ESO.

Figure 5.13: Current stakeholder engagement



Figure 5.14: Summary of key market information initially to be shared

Signposting future opportunities	Highlighting current opportunities	Sharing operational information
<ul style="list-style-type: none"> EHV, HV and LV heatmap data, identifying congestion networks Early flexibility tenders seeking proposed solutions several years in advance Long Term Development Statement and Network Development Plan DFS Procurement Statement 	<ul style="list-style-type: none"> DFS Procurement Statement Standard flexibility tenders seeking proposed solutions for coming year Flexibility workshops and newsletters ANM zones, stack and curtailment information 	<ul style="list-style-type: none"> DFS Procurement Report and tender outcomes report, including price and carbon Flexible Power/ANM utilisation reports, including price and carbon DER information via Embedded Capacity Register
Opportunity to derive insights for flex providers to maximise their market engagement and value		

Assuring clear and accurate flexibility requirements: In RIIO-ED1 we formalised the approval and sign-off of our requirements, prior to issuing the tender, so that there were the appropriate internal reviews and challenges to ensure the requirement specification was accurate. We adapted the existing Ofgem data assurance guidelines and now require any tender documentation to be signed off by a member of our senior leadership team. In RIIO-ED1 we will publish a methodology statement describing how we derive and detail our requirements, including the approval process, which we will review periodically with stakeholders and refresh as required in RIIO-ED2.

Reporting requirements and publicising tender outcomes: In RIIO-ED1 the Open Networks Project established processes for publishing market information on the volumes of flexibility sought by DNOs, the results from any tendering process for flexibility and its subsequent utilisation in network operation. These reporting requirements were extended as part of the new licence conditions, SLC 31E, implemented for the UK's compliance with the EU Clean Energy Package. As per SLC 31E we will produce annually:

- on 1 April a distribution flexibility services procurement statement (DFSP statement) setting out our plans and processes for purchasing flexibility for the next 12 months, and
- on 1 May a distribution flexibility services procurement report (DFSP report) that outlines the outcomes of our procurement processes and the utilisation of new and existing flexibility contracts, including energy efficiency programmes.

Both the DFS procurement statement and report will be available on our website. We will comply with SLC 31E requirements and publish the results of any tender outcomes, including details of the counterparty to the contract, technology type, capacity and volume procured, length of the contractual agreement, payment structure of the contract, and the price agreed, including any additional information agreed by the Ofgem led industry group for the provision of services for each tender round.

As agreed in the Open Networks Project we will use the consistent reporting format for the results of these tenders detailing this evaluation. To aid DNO comparisons and understand GB totals all the information relating to the procurement and utilisation of flexibility i.e. the total volume of tendered, contracted, dispatched and provided flexibility will continue to be published bi-annually on the ENA 'flexibility in GB' webpage.

In RIIO-ED2 we will introduce a 10 day standstill period when we publicise the outcome of our tender processes, prior to the notification of the contract award and signing of the contract. The period can be used by the bidders or interested parties to ask questions, challenge the outcome or provide comments. If during the 10 day standstill period, an affected party submits a report evidencing the illegitimacy of the outcome our DSO Stakeholder Panel will be asked to review it.

Continuous improvement

Marketplace platforms: In RIIO-ED1 we tested the provision of flexibility procurement to understand the best price for this service. This enabled us to cost the provision of this service from third-party providers for inclusion in our business plan. Currently there is little competition in the provision of marketplace platforms and as such the transaction fees are based on a percentage of the successful tender. We believe this transactional overhead represents a barrier to the use of flexibility.

To introduce competition in the provision of marketplace services in RIIO-ED2 we propose to

- Collaborate with industry partners to develop a standard data format for flexibility services requirements so that all marketplace providers can easily access, download and publish our needs; with access enabled through APIs on our data portal, and
- tender for marketplace platform services at least annually, each time looking for new and innovative ways to encourage new providers to the marketplace by developing new access routes for network users. Importantly, we will remain open to receiving and evaluating innovative bids from marketplace platform service providers to encourage different options for expanding the routes to market for flexibility providers. This may result in potentially using multiple marketplace platforms to expand routes to market driven by stakeholder preferences.

As competition develops and the transaction costs are driven down through innovation and competition, we will seek to change the payment structure to fixed fees, just like the transformation of the estate agent model. To reinforce our commitment to competition and to drive value for money for our customers we will openly publish the outcome of each tendering round alongside the transaction costs agreed. We will use the platform's standard APIs, pre-qualification and credit-checking services, if they adhere to the standards and protocols agreed with other network and system licensees within the Open Networks Project.

Dynamic procurement: We currently procure flexibility services months/years ahead of need. This is driven by the need to secure the service due to a lack of market liquidity, maintaining the continuity of supplies by proactively utilising flexibility services instead of conventional reinforcement solutions. In RIIO-ED2 all flexibility procurement will be more dynamic and therefore we will use short-term procurement arrangements i.e. similar windows and arrangements to those utilised by the ESO. The alignment of procurement protocols, across DSOs and ESO, will assist the development of a liquid flexibility market as flexible providers connected to DNO networks can choose, potentially in every half hour, who to provide their flexible service to.

Flexibility contract lengths: We will use the Common Evaluation Methodology tool, developed in RIIO-ED1 as part of the Open Networks Project, to evaluate the provision of flexibility, and to help us specify the optimum contract length in terms of cost-effective investment. We will continue to engage with our stakeholders through the Open Networks Project and dedicated workshops and surveys to gauge stakeholder feedback on the optimum length of contracts, and where it is efficient to do so and supported by this tool, we will explore these options. Only when there is little, or no competition will we use contracts for more than one year. These contracts will only be renewed each year after reviewing the

availability and capability of potential providers and we will not renew a contract more than four times to encourage potential future engagement and competition.

All flexibility contracts will be reviewed annually to determine reliability, and to ensure alignment with network requirements. Where new opportunities for flexibility arise such as for connections-driven reinforcement, longer-term contracts will be trialled, while maintaining market stimulation in the area to provide liquidity and longer-term network security. Shorter-term contracts will also be utilised, with compacted procurement timescales for network resilience issues such as disruptive failures and storm resilience, helping to reduce reliance on carbon intense mobile generation.

Further flexibility evaluation development: The newly developed Common Evaluation Methodology tool is available in Microsoft Excel and will be updated to reflect any changes for the RIIO-ED2 Ofgem CBA. Under open governance arrangements provided by the Open Networks Project we will lead further discussions on the development of the CEM tool, specifically looking at the valuing optionality and a carbon impact assessment. As in RIIO-ED1 we will lead the industry in assessment methods by developing ROCBA further in RIIO-ED2. Our aim is to enhance ROCBA incorporating in the evaluation approach micro scenarios, full carbon impact assessment, asset management interventions alongside reinforcement needs, quantification or qualitative assessment of whole system outcome etc. We expect that these enhancements will eventually be incorporated into the CEM Tool. Where it is not possible to evaluate an option using either of these assessment tools we will use the Whole System CBA developed within the Open Networks Project. Our stakeholders told us in response to our DSO strategy documents, published in July 2020, that they would like us to prioritise the purchase of low carbon flexibility, so this will be embedded in our flexibility procurement process.

Flexible connections: In RIIO-ED2 we will utilise our new ANM system to manage in real-time constraints on the networks created through unplanned abnormal running arrangement within defined ANM zones through the use of flexible connections. We will continue to offer flexible connections in RIIO-ED2, although it is likely that the outcomes of the Access & Forward-Looking Charges (A&FLC) Significant Code Review (SCR) will have an impact on the scope of and charges for flexible connections. Our current flexible connections products are detailed in Figure 5.16 adjacent.

Figure 5.15: Flexible connections alongside flexibility services

EREC P2/7	System normal	N-0	Procured services to manage Pre-fault	Buy: SUSTAIN SECURE
	System abnormal	N-1, N-2, N-3	Procured services to manage Post-fault	Buy: RESTORE DYNAMIC

Figure 5.16: Flexible connections products

Name	Description
System normal connection	A system normal connection is disconnected or constrained when there is a first circuit outage affecting the circuit dedicated to supplying the customer or the local distribution system. This connection could be managed either remotely or via an inter-tripping scheme.
Import/Export limited connection	A connection where the installed equipment has a greater import/export capability than that which has been agreed to be imported/exported onto the Electricity North West distribution system.
Timed connection	A connection arrangement where connection capacity is subject to restrictions within specific time periods.
Active network management	Use of control systems to modify import and/or export, through set point control in line with previously agreed limit

Since 2015 we have specified that all new generation installations above 200kVA must be fitted with an RTU to retrieve real-time information on the import and export of energy from and to our network. Since 2017 we have installed an RTU at customers' premises for all new flexible connections (i.e. new flexible demand or generation connections above 200kVA). This is to understand the energy flows from and to our network but also for receiving control signals from our ANM system for managing the customer's energy flows. Where this occurs the RTU is used to deliver a request to the site to modify its demand pattern; it does not enact hard control onto a customer's assets.

Impact of Minded to Position for Access & Forward-Looking Charges Significant Code Review

This information has been created based on the details contained in the Minded to Position consultation published by Ofgem in June 2020 and in paragraphs 5.37 to 5.41 of the ED2 business plan Guidance published by Ofgem in September 2021. Further information on the impact of the Significant Code Review on our load related expenditure is contained within Annex 3, Part C.

We expect to amend the range of flexible connection types in the coming years due to the changes expected from the SCR. In general, we expect that from 1 April 2023 we will see most demand and generation customers opting for a firm connection with a minority opting for flexible connection arrangements either on a permanent or temporary basis. We note that there may be differences between the way demand and generation customers choose the right solution for them due to the proposed changes in the connection boundary (ie no reinforcement charges for demand and shallower reinforcement charges for generation). We expect that some customers will happily exist on a flexible connection arrangement as they avoid reinforcement charges and they can operate satisfactorily within these arrangements or we will offer flexible connection arrangements for a transitory period whilst the

network capacity is provided either through network development or procurement of flexibility services, guided by a costs and benefits analysis to determine the most efficient long term solution. This transitory requirement enables a quicker connection to the network, avoiding delays. We set out below our initial views on the potential impact of the SCR on those customers with existing non-firm and/or flexible connections and these customers seeking a new connection to the network.

Customers seeking to change their existing non-firm and/or flexible connections: We expect that some of our existing customers on non-firm and/or flexible connection arrangements will contact us on or around 1 April 2023 to discuss their connection arrangements. Of those that contact us we expect all of them to enquire about a firm connection arrangement, noting that some may decide against progressing an application due to the assessment and design fees. Of those that apply for a firm connection we are uncertain how many will accept their connection offer; we expect some will change to a firm connection arrangement, but some will opt to remain on their existing non-firm and/or flexible arrangements. Depending on the network intervention necessary to provide a firm connection some of these customers may be asked to be flexible for a period whilst the network capacity is obtained to provide the necessary firm connection capability.

Customers seeking a new connection: We expect that most, if not all new applicants will seek a firm connection to our distribution network post 1 April 2023. After evaluating the options and discussing the scope of the connection offer with our customers we expect most customers will opt for a firm connection, but we envisage there will be customers that opt for a flexible connection either on a permanent basis or on a transitory basis, as described above.

Dispatch, baselining and settlement: In RIIO-ED1 we joined the Flexible Power collaboration and plan to link [Flexible Power](#) to our new ANM system in late RIIO-ED1. We will utilise Flexible Power to proactively manage network demand with the use of procured flexibility, both in the system normal and abnormal running arrangements. Joining the Flexible Power collaboration means our approach is standardised and aligned with industry best practice as identified through the Open Networks Project:

- Dispatch is aligned with the standard protocols i.e. we will utilise Primacy rules to coordinate and the standard API interface to engage with flex providers, and
- Baselining and settlement is also aligned with industry best practice, including metering.

We are aware that third party marketplace platform service providers have plans to develop the end-to-end functionality to provide signposting through to settlement services to DSOs. As these services come on line we will review the service and costs to ensure that we are always delivering value for money for our customers. For the avoidance of doubt dispatch instructions and associated system architectures will not be hard coded.

Secondary trading: Facilitating secondary trading will mean that customers will be able to trade both their risk of curtailment, as well as excess capacity they may have. The trading of curtailment risk is outlined in [Section 5.2](#). We will facilitate the trading of capacity

between parties, acting as a neutral market facilitator. Key to this is the ability to maintain network continuity ensuring that trades are fair and do not compromise network security.

During RIIO-ED1 there have been many projects and trials to facilitate trading between network users within a local energy market, but no enduring model has survived beyond a trial. So in 2021 we submitted a Network Innovation Competition proposal called BiTraDER to undertake a project to develop the trading rules and functionality to deliver curtailment liability trading. If successful, the solution will be implemented as business as usual in RIIO-ED2. We will within the tender for marketplace platforms also seek platform services that facilitate other forms of secondary trading to encourage providers to come forward with solutions. We will utilise the framework developed as part of the Open Networks Project in their industry-led A&FLC SCR work on:

Transparent information sharing

- Ability to maintain network continuity
- Visibility of the other trading parties
- Transparent trading arrangements.

and consider the non-DSO services identified within WS1A P6 (2019).

Working with the other network operators through the Open Networks Project we will establish a range of fair and transparent market rules to facilitate peer to peer trading. Peer to peer trading may allow two or more users to share capacity between them or establish processes to allow both parties to connect to the network without the requirement for network reinforcement. For example a demand customer may choose to enter into contract with a nearby generator, provided the two parties net energy usage was balanced this would not cause additional stress to the DNO network at higher voltage levels. However, this type of trading requires a body to confirm the network assets are able to deliver the physical trade of energy; this is a role the DSO would need to carry out acting as a neutral market facilitator. An additional duty which will be required is ensuring that the virtual trading of capacity is fair and that neither party is involved in disreputable trading.

Managing conflicts of interest: Throughout Sections 4 and 5 we have laid out how we structure our organisation and how we will be open and transparent in our decision-making processes and have the necessary oversight and compliance reporting processes to manage perceived or actual conflicts of interest. We believe it is too soon, costly and disruptive to progress legal separation of DSO functions and activities from the distribution network licensee. Instead we plan to use the RIIO-ED2 period to develop the distribution system operation activities through learn by doing and to consolidate that learning into business as usual. Over the 5 year period the DSO and DNO teams will work collaboratively to enable our workforce and leadership to fully explore, understand and implement the DSO transition. The measures outlined in Sections 4 and 5 provide a robust and transparent governance and reporting framework that will give confidence to our customers and stakeholders that we are always acting as a neutral market facilitator embracing energy efficiency and flexibility first to deliver network capacity for use by customers at the most efficient price.

6. DSO costs and benefits

Key Information

In this section we highlight the costs and benefits of undertaking the DSO activities in RIIO-ED2. The delivery cost for developing the enhanced functionality for distribution system operation and performing these new and extended activities is £7.3 million per annum over the RIIO-ED2 price control period. Whereas the benefits derived from better forecasting techniques, the utilisation of innovative solutions from RIIO-ED2 and previous price controls, and purchasing flexibility instead of building new assets is estimated at over £210 million.

Our proposals for ED2

Our DSO Transition Plan will drive benefits for customers and society, with customers benefitting from the lowest possible bills while we facilitate the transition to Net Zero for the North West region.

Figure 6.1 illustrates the savings from the delivery of enhanced distribution system operation functionality reflected in the reduced load related budget. The savings are driven from the application of innovative solutions developed in RIIO-ED2 and previous price control periods, the more accurate network planning from the use of the world class ATLAS forecasting methodology and more granular data from the introduction of smart metering and network monitoring and the procuring of flexibility services instead of creating new capacity by reinforcing network assets. The savings in the load related expenditure budget from distribution system operation activities is £248 million. Figure 6.2 on the next page details the individual elements that makeup the total savings in the load related expenditure budget.

Figure 6.1: Estimated savings from DSO activities on ED2 load related expenditure

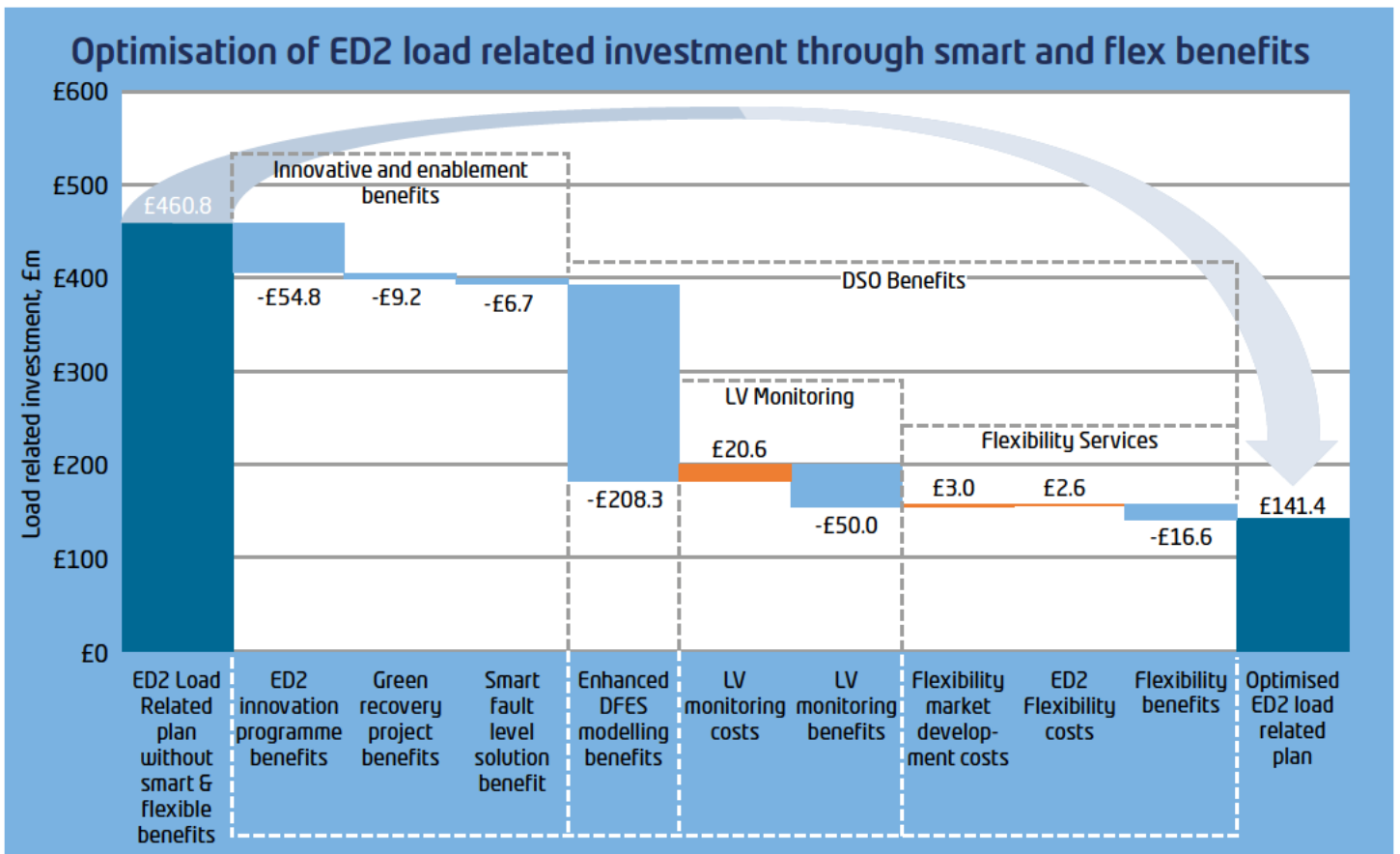


Figure 6.2: Impact of RIIO-ED1 and proposed RIIO-ED2 initiatives on load related expenditure costs

DSO activity area	Description	Value, £M
ED2 network intervention costs reference point	Total ED2 intervention costs without	£460.8
ED2 innovation programme benefits	Estimated benefit from implementing ED2 innovation projects into business as usual	-£54.8
Green Recovery projects benefits	Benefits derived in ED2 from the Green Recovery projects delivered in ED1	-£9.2
Smart fault level solution benefit	Estimated derived from the application of an innovative fault level solution	-£6.7
Enhanced DFES modelling benefits	Estimated benefit of more accurate network planning from utilising the granular forecasts from the ATLAS methodology	-£208.3
LV monitoring costs	Total cost of installing new LV monitoring to achieve 95% of customer coverage	£20.6
LV monitoring benefits	Benefit derived from network intervention costs from utilising granular operational data from smart meters and new monitoring equipment	-£50.0
ED2 network intervention cost	Revised ED2 intervention cost	£141.4

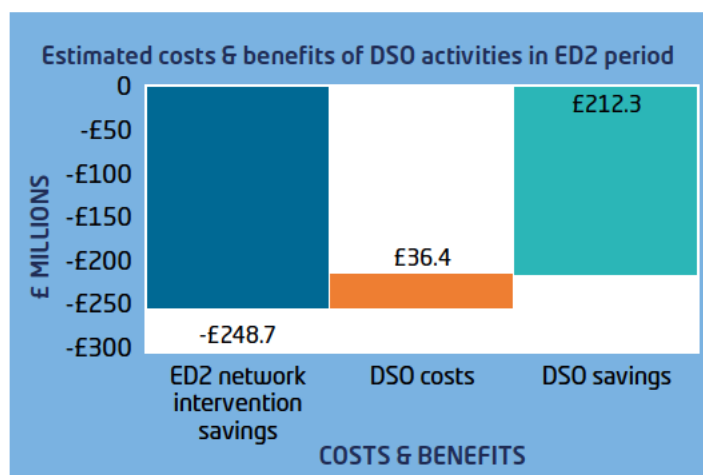
The cost of the DSO transition plan is £7.3 million per annum or £36.4 million for the RIIO-ED2 period. Figure 6.3 shows the estimated savings of distribution system operation activities for RIIO-ED2 as £212 million having taken into consideration the DSO costs. This is a limited benefits assessment as although there are additional benefits that could be included these have not been due to the difficulty of quantification. Additional benefits may accrue such as using DER to enhance resilience or from the interaction and data exchange with the ESO; as RIIO-ED2 progresses information will be gathered to assist with a full benefits assessment.

Our DSO Transition Plan sets out our initiatives for the next price control period. In RIIO-ED2 we plan to invest [REDACTED] a further £14.2 million on IT systems split between new systems and the development of existing systems and £19.4 million in people and processes to deliver the DSO roles, activities and baseline expectations for RIIO-ED2.

The expenditure in new systems relates to the development of an active network management system and a flexibility management system to operate flexibly network assets and contracted customers. There are refresh and upgrade costs for our forecasting and evaluation tools and costs for the provision of interfaces for sharing data using agreed common formats.

There is further information on the totality and profile of costs and a deeper dive into the makeup of the costs in the M19 Tab within the business plan Data Tables workbook and associated commentary.

Figure 6.3: Estimated total savings from dso activities in RIIO-ED2



7. Delivering additional benefits for our customers

Key Information

This section summarises our proposals for delivering additional benefits to our customers within our DSO Transition Plan. The key additional deliverables relate to the creation and scope of the powers of the DSO Stakeholder Panel and our novel approach to managing curtailment in the ANM application. These we see are highly valuable to our customers and set us apart from the other DNOs.

Proposals for ED2

This section highlights those additional elements of our DSO Transition Plan that are above the baseline expectation and will provide additional value, at marginal cost, to our customers and stakeholder. There are a number of cross cutting themes which have been identified; these can be located within Table 7.1. For each DSO role there is a breakdown of the additional activities we intend to deliver in addition to those identified within the baseline.



Table 7.1: Proposed additional deliverables within cross cutting themes

Deliverable	Baseline expectation	Additional activities	Estimated costs, pa
Stakeholder engagement and involvement	Publish engagement strategies and plans	Create a DSO Stakeholder Panel, to oversee and guide our engagement with the DSO community, including bespoke group engagement plans e.g. vulnerability and the publication of data. Outlined in Section 4.1 .	£100k
Transparency, oversight, and compliance	Publish methodologies and decisions	Empower DSO Stakeholder Panel to review investment recommendations and methodologies, when challenged. Outlined in Section 4.1 . Create a DSO Compliance Officer role to ensure compliance with published processes and methodologies. Outlined in Section 4.3 .	See above £75k
Facilitating the transition to Net Zero	No requirement	Deliver our Decarbonisation Plan and publish company Net Zero targets, provide decarbonisation advice, and promote and support LCT adoption.	Refer to business plan
Stimulate community and local energy	No requirement	Support community energy growth by: providing financial support through our Powering our Communities Fund, offering enhanced customer connections support, and providing a trusted source of information.	Refer to Annex 5 Community and Local Energy Strategy

Table 7.2: Proposed additional deliverables within Role 1, Planning and Network Development

Deliverable	Baseline expectation	Additional activities	Estimated costs, pa
Forecasting methodology	Develop and publish robust methodology	Develop the ATLAS methodology further to increase its granularity to cover all network voltage levels, taking into account third party data sources such as smart meter data; and publish this for enhanced transparency. Forecasting will extend down to the LV street level to show the forecasts for individual cables. Outlined in Section 5.1 .	£180k
Evaluation methodology	Develop and publish robust methodology	Develop ROCBA tool further and publish this for enhanced transparency. These developments will include: micro scenarios, full carbon impact assessment, asset management interventions alongside reinforcement needs, quantification or qualitative assessment of whole system outcome etc. Outlined in Section 4.4 and Section 5.3 .	£30k
Decisions review and oversight	Publish methodologies and decisions	Apply standstill period for all intervention recommendations. Apply re-evaluation of decision where material variations to asset solutions are found between budget cost and delivery cost. Apply fixed cost for delivery of asset solutions. DSO Stakeholder Panel review of recommendations, if the proposed solution is challenged. Outlined in Section 4.1 and Section 5.1 .	£0k ¹ Included in DSO Panel costs
Network utilisation data	Publish heatmaps	Publish enhanced heat maps, including for the low voltage network, using enhanced transparency from the ATLAS methodology. Outlined in Section 5.1 .	Included in ATLAS cost
Forecast reactive power data	No requirement	Publish reactive power (kVAr) forecasts for all voltage levels generated by ATLAS. Outlined in Section 5.1 .	Included in ATLAS cost
ESO reactive power data sharing	No requirement	Share reactive power (kVAr) forecasts at the boundary points between our networks, generated by ATLAS. These forecasts will be shared via dedicated communications links in a CIM format. Outlined in Section 5.1 .	£10k

¹ No cost as approach will be adopted as business as usual in RII0-ED2.

Table 7.3: Proposed additional deliverables in Role 2, Network operations

Deliverable	Baseline expectation	Additional activities	Estimated costs, pa
Curtailment index usage within ANM	Publish dispatch methodology and rules	Utilise curtailment index values to create a fair curtailment order. Develop the MOM system to combine curtailment with flexible service utilisation. Publish MOM rules, stack information and curtailment index values. Monitor and publish remaining curtailment index values to signal potential need for additional services or reinforcement by ENWL or to facilitate curtailment trading. Outlined in Section 5.2 .	£50k
Whole System collaboration	Publish methodologies and decisions	Share short term capacity headroom at boundaries to adjacent DNO or embedded IDNO networks to promote efficient use of network and decision making and seek reciprocate information. Outlined in Section 5.2 .	£0k ¹
Real-time data exchange	Only ESO	Promote sharing boundary information in real time with interconnected DNOs/IDNOs. Outlined in Section 5.1 .	£0k ¹

Table 7.4: Proposed additional deliverables in Role 3, Market Development

Deliverable	Baseline expectation	Additional activities	Estimated costs, pa
Merit Order Management within ANM	Neutral market facilitation	Enable curtailment liability trading in ED1 via ENWL, and via platform in ED2. Resolve DSO/ESO conflicts through publication and trading of stack position. Tender MOM provision in ED2. Outlined in Section 5.2 and Section 5.3 .	£50k
Competition in platform services provision	Publish methodologies and decisions	Regularly retender distributed flexibility service platform services provision in ED2. Remain open to bids that encourage different options for expanding the routes to market. Outlined in Section 5.2 and Section 5.3 .	£0k ¹
Encouraging market solutions	Neutral market facilitation	Actively seek alternative solutions to conventional reinforcement; including those from other system/network operators and third parties. This will also encourage future market liquidity. Outlined in Section 5.1 and Section 5.3 .	£0k ¹

8. DSO Performance framework

Key Information

In this section we propose the framework and the performance metrics or indicators to monitor our progress. These reflect our stakeholder recommendations and show how we are delivering the DSO Strategy and achieving our DSO Transition Plan.

Stakeholder engagement

We wanted to give our stakeholders the opportunity to input into the development of our performance metrics, so we developed a plan to capture and incorporate detailed stakeholder feedback for the development of the metrics as RIIO-ED2 progresses. The key aims were as follows:

1. Develop a rationale to why particular metrics are used - help identify and incorporate specific measures that are meaningful and purposeful for both ourselves and our stakeholders throughout the ongoing DSO journey, and
2. Capture additional feedback around awareness and understanding - of the DSO transition generally, why it is happening and what this means for our stakeholders.

The second aim, although not specifically related to the DSO metrics, has been developed with a view to improving our communications and engagement around this complex topic. We recognise that some stakeholders have a more basic understanding than others and that the more we can improve that, the more we can 'bring everyone with us and leave no-one behind'.

We took a two-stage approach to the engagement and below is a summary of our approach and methodology. Both 'phases' of activity were completed by October 2021 to ensure a thorough review of all stakeholder feedback across both phases, incorporating any insight into thinking around our DSO performance measures and providing a comprehensive overview for the final submission in December 2021.

To ensure focus, pace, objectivity and challenge we selected an external partner to support us throughout this process, and agreed the following approach and methodology:

Overall approach: We took advice from our research and engagement partner, the CEG and internal experts; agreeing that we need to be inclusive and proportionate in terms of who we involved in the process. We included a wide range of participants from engaged and informed stakeholders to those less familiar with the process and employed a range of engagement tools including one-to-one interviews, focus groups, panels and an online survey (see Figure 8.1 below for more details on rationale).

Engagement approach: We focused primarily on qualitative engagement to enable us to hold in-depth conversations and give the opportunity to explore anything relevant or significant to any one stakeholder. This allowed perspectives, concerns, and ideas to materialise which we hadn't perhaps considered already.

Stakeholder selection: To ensure that feedback was far-reaching, relevant and useful, we took a view across the whole organisation to identify the touchpoints between emerging DSO processes and our stakeholders/ audiences. We asked ourselves

'Who is impacted by new processes and opportunities, how do we think they are/will be impacted and why are DSO changes relevant and important to them?'

Information and language: The DSO area is a complex one, often only fully understood by those closest to the activities. We recognised the importance of the language and content we use with participants in this process whether a one-to-one interview or a focus group; and we were committed to use plain and straightforward language to ensure as accessible and inclusive a process as possible, and avoid confusion and alienation from the process, especially with a non-technical audience.

Methodology: The two-phase approach involved the following:

Phase 1 - June/July 2021: Included an initial review providing a contextual understanding of best practice related to setting of performance measures and using industry and sector knowledge. This was followed by twelve in-depth interviews with informed and

Figure 8.1: Summary of the six research activities, its purpose and type and number of participants

Research activity	Purpose	No. of Participants
Focus groups with key stakeholders/partners	Level of support, expectations, priorities, views on how to measure success, understanding of DSO transition and roles	20 (across 4 groups)
One-to-one in-depth interviews with highly-engaged stakeholders	Drill down into the three roles and related metrics with stakeholders that have a specific interest in a certain area.	7
Focus groups with SME customers	Understand level of awareness and support from SMEs in ENWL's DSO transition, what they expect ENWL to do and how these measures would affect their business.	14 (across 2 groups)
Deliberative event with domestic customers 'Plugged in Panel'	Understand level of awareness and support from domestic customers in ENWL's DSO transition, the benefits they would like to see, potential risks and expectations	24
Online survey with domestic customers	Test out support and understanding in larger numbers via additional quantitative data	61 responses
Follow up interviews with respondents from Focus Groups	More detailed understanding of how ENWL should measure success with regards to roles set out as part of DSO transition	5

engaged stakeholders to gain insights into the proposed principles and metrics.

The output of Phase 1 was a report detailing feedback and analysis of stakeholder views around each of our DSO roles and relevant metrics attached to each. This was used to inform Phase 2, in terms of which wider stakeholders to include, key areas to explore further etc.



Phase 2 – Sept/Oct 2021: Involved exploring metrics and roles further with four stakeholder groups: key stakeholders (primarily businesses), highly engaged and informed stakeholders (including ENWL partners), SMEs and domestic customers. The aim of Phase 2 was to extend both breadth and depth of the engagement: depth in terms of digging deeper in terms of the detail of the metrics explored in Phase 1 (identifying meaningful measures etc.) and breadth in terms of testing our understanding and priorities with additional groups. Figure 8.1 summaries the research activities, their purposes and the type and number of participants involved in the Phase 2 of our stakeholder engagement on DSO performance metrics.

In total, 126 customers and/or stakeholders were engaged with as part of Phase 2 of this research.

Proposals for RIIO-ED2

Oversight and evaluation: In Section 4.1 we proposed the creation of an independent DSO Stakeholder Panel for RIIO-ED2 with the responsibility to monitor and evaluate our ongoing performance, using evidence from our DSO stakeholder community and in accordance with Ofgem guidance. This was supported by our stakeholders as they believe the Panel should have a role of providing feedback on performance of the DSO and ensuring transparency on why decisions were taken. Each year the DSO Stakeholder Panel, as part of their oversight role, will review the previous year’s delivery of the each of the performance measures judging whether each measure has been delivered to the right time and to the required quality. This independent verification is vital as the outcomes are monitored using a range of quantitative and qualitative measures. These measures are linked through to consumer outcomes by our planned initiatives and Section 9.5 shows the mapping between our actions, initiative and deliverables to the Ofgem baseline expectations.

To aid clarity which performance measures will be directly evaluated and verified by the DSO Stakeholder Panel the table across describes the proposed approaches with the symbols indicating each approach; these symbols are then used throughout the proposed performance measures detailed below.

Evaluation and verification	Symbol
Quantitative evaluation undertaken by DSO Compliance Officer and verified by the DSO Stakeholder Panel	
Qualitative evaluation and verification undertaken by DSO Stakeholder Panel	

Progress against the measures will be evaluated and verified by the DSO Stakeholder Panel every quarter and then represented in a scorecard model for publication annually. This ensures that the

DSO Stakeholder Panel is continually reviewing progress whilst encouraging and challenging the ENWL DSO team to deliver against their commitments with the annual publication providing an opportunity for everyone to see how ENWL is performing as well as an opportunity to comment.

In addition to the performance metrics proposed below, we propose publishing two annual reports; the first will detail our progress on the DSO transition and provide an overview of our annual performance, whilst the second will detail our compliance performance. Both reports will be developed by our DSO Compliance Officer in conjunction with the DSO Stakeholder Panel. These reports will act as a focus for our commitment to continuously improve our performance throughout RIIO-ED2.

Incentive framework: Ofgem advised within their SSMD that they will introduce a new output delivery incentive (ODI) through which an ex post review of DNO delivery of their activities would be conducted. This has been the subject of industry working group discussions throughout 2021. As Ofgem is still considering the structure and form of assessment for the strategy delivery incentive for DSO at this point we share our views below which are consistent with our response in to the SSMC in 2020.

We continue to support the proposal to introduce a DSO ODI as long as the chosen metrics and performance standards support consumer outcomes, are applied consistently across the industry and are appropriate for the regional circumstances. For example; a simple metric of volume of flexibility services contracted would not be appropriate as larger DNOs and those with more constraints to solve could look positive under this metric compared to those who have capacity available to use without any funded interventions.

As RIIO-ED2 is likely to be a transition period for DSO we believe that any incentive framework should, at least initially, be reward only. As experience of DSO functions and activities mature the incentive framework could be a penalty/reward mechanism with the value increased if it returns multiples of value back to customers. It is proposed the value of reward is material enough to drive network operators to find innovative ways to deliver higher performance standards over time, but again companies shouldn’t be penalised for understanding and reflecting customer and stakeholder requirements and priorities which may be different to those perceived as being more pronounced needs in other areas of GB where this is required and supported by customer and stakeholder engagement. Doing the right things for customers should be rewarded, including going at the right pace for the regional circumstances and taking proportionate actions to the scale of issues being tackled.

Reward of delivery activities should take into consideration the net benefits delivered to stakeholders, rather than simply looking to keeping pace with other DNOs. Due to regional variations in network architecture and consumer patterns there may be more requirement for some DSO functionality to be integrated into business as usual within some DNO licence areas earlier than within others. These regional differences can also generate different problems with the delivery of DSO functionality, e.g. variations in market liquidity of DERs to provide flexibility services. DNOs however should, as much as possible, be looking to standardise user experience nationally, where this is shown to be delivering best practice.

Our preference is that the assessment should be ongoing throughout RII0-ED2. The monitoring and reporting mechanism should be through the annual RIGs submission, accompanied by the appropriate commentary and justification. The expectation is that there would be a reward assessment every year. Should Ofgem wish to develop an ODI it may be appropriate for the first year to be a trial year to gain experience to feed into the approach over the rest of the ED2 period.

Given the structure of the incentive, form of assessment and common performance metrics (if this is the final outcome) are still being considered by Ofgem, it should be noted that the performance metrics we have included in our plan have been designed to form the basis for evaluating our performance in meeting the Ofgem baseline expectation and indicating our progress in delivering the new and enhanced DSO functions and activities.

The performance measures detailed below are not our proposals for common performance metrics linked to any incentive, rather these performance metric proposals, detailed below, will enable our stakeholders, via the DSO Stakeholder Panel, to evaluate our progress in delivering our DSO strategy and actions within this Transition Plan.

DSO1.1: Enhancing forecasting, simulation and network modelling capabilities

Our stakeholders appreciated that forecasting is difficult to do (and cautioned against setting over-ambitious targets) as elements that impact the forecast will be out of the control of the DSO. For instance, the closure of a large factory in ENWL's region would change the electricity demand forecast significantly and yet could not be foreseen or influenced by ENWL. But stakeholders were keen that data is sufficiently granular that local area forecasts can be produced which address very local issues and don't rely on averaging out wider regional data. The ENWL region is incredibly varied in terms of industry, tourism, and housing density and current capacity and demand forecasts should take these

Developing the performance measures with stakeholders:





The sections below provide the detail of performance measures for the DSO Roles 1, 2 and 3 respectively, as developed in conjunction through our stakeholder engagement described above. The background colour denotes whether the performance measures are qualitative (purple) or quantitative (blue).

Role 1: Planning & Network Development

The longer-term element of this first role was seen as crucial to DSO development by all stakeholders. They felt that if the DNO is able to take a more joined-up view of needs across the entire network now and into the future, then this would provide real benefits, particularly for stakeholders responsible for infrastructure development activities. Businesses were particularly supportive of any local area data sharing and modelling and anything that would result in reducing carbon.

differences into account. Stakeholders expected ENWL to “get on with it” and produce robust models, and they didn't need to know the detail, but were keen that the forecasts and models should include data from a wide range of sources and not restrict models to simplistic metrics, such as average population growth.





They supported tracking forecasting accuracy, as it directly links to the success of the forecasting and modelling activity. That said, there was some concern that the 90% target would be difficult to achieve given the factors and ENWL's lack of influence over future demand. This is also a very long-term metric that couldn't be measured for a significant period of time.

DSO1.1: Enhancing forecasting, simulation and network modelling capabilities				
Purpose & Customer benefits	Measurement points– meets	Evidence for meets	Frequency	Evaluation and verification
To improve the accuracy in decision making and minimise load related expenditure by delivering efficient, timely, value for money and low carbon interventions. Baseline expectation: 1.1.1	Install 100% of agreed volume of monitoring equipment by 2028	100% of monitoring equipment installed	Counts reported quarterly	
	Publication of LTDS, Network Development Plan, workbooks of forecasts	Publication of workbook of forecasts reviewed by DSO SP	Produced annually	
	Stakeholder consultation of forecasting, simulation and network modelling methodologies and outputs	Publication of feedback from stakeholder consultation and action plan reviewed by DSO SP	Produced annually	
	Report on forecasting accuracy for NDPs; any outliers to be justified	Annual monitoring performance report	Produced annually	
Context: This encourages the business to develop models and processes to improve the accuracy and visibility of modelling for forecasting, network simulation and network planning so that the business deliver efficient and timely interventions.				
As is: In ED1 ENWL using its ATLAS methodology for forecasting, the Future Capacity Headroom (FCH) model for network simulation at HV and LV, and the IPSA modelling software package for network simulation for EHV and network planning.		To be: In ED2 we propose to 1) amend ALTAS to use collected HV and LV data and deliver HV and LV kW & kVAr forecasts; 2) amend the FCH model to accept collected HV and LV or forecast HV and LV, and run granular network simulations; 3) Refresh the IPSA tools to run time series network simulations and network planning for all voltage levels, specifically delivering flexible connections analysis.		

DSO1.2: Sharing of transparent planning data to improve network visibility

Overall feedback from stakeholders was that any data sharing must be transparent and proactive, but the data must also be proven to be useful to users. The end results of how the data is used are more important than the sharing of the data itself. Ongoing stakeholder engagement is essential here to identify data needs and implement improvements in data quality and how it is shared. The use of a survey to measure success was valued and was thought to be appropriate as long as ENWL demonstrated what actions they would take to improve the data and delivery as a result of survey feedback.

Some stakeholders commented that it is a point of frustration for them that they don't currently have any visibility of how other network activity is planned in a local area. As well as sharing maps of current demand vs. capacity, there was an expectation that this would be overlaid with forecast projections to enable organisations to plan for the future. The maps should be updated monthly, or at least quarterly. The target of delivering $\geq 90\%$ of data within pre-agreed timescales was felt to be an ambitious and challenging metric.




DSO1.2: Sharing of transparent planning data to improve network visibility				
Purpose & Customer benefits	Measurement points– meets	Evidence for meets	Frequency	Evaluation and verification
<p>To promote the sharing of planning data with system users, as well as other network and system licensees to encourage openness and transparency of decision making and whole system outcomes.</p> <p>Baseline expectation: 1.1.2</p>	A stakeholder survey to measure the accessibility, frequency and level of service associated with the DNO's network data; this would cover the level of engagement the DNO has had with users and how well it has responded to any queries	Publication of stakeholder satisfaction survey results reviewed by DSO SP	Produced annually	
	Share agreed datasets, including GIS available for download from website, refreshed quarterly from April 2024	$\geq 90\%$ of agreed datasets available to download from own website per month	Count reported quarterly	
	Publish hosting capacity and network utilisation data (via heatmaps) for all voltage levels and refresh quarterly from June 2023, and monthly from 2026	Count of refreshed heatmaps on website per quarter ($\geq 90\%$ of refreshed heatmaps shared)	Count reported quarterly	
	Use agreed method (e.g. ICCP link) to exchange planning data, monthly	Count of planning data exchanged between licensees per quarter ($\geq 90\%$ data exchanged within pre-agreed timescales averaged over a quarter)	Count reported quarterly	
Context: This encourages the business to develop processes and systems to collect, process and share high quality, easy to access and easy to use planning data in a common agreed format				
As is: In ED1 ENWL shares network data with everyone via LTDS, ECR via DCUSA obligation etc; and shares operational network models and data with the ESO, as per Grid Code obligation.		To be: In ED2 we propose to 1) provide all planning data via dedicated communications links (eg ICCP), and 2) offer to share planning data with other system/network licensees our planning data via ICCP or another agreed format.		

DSO1.3: Sharing of Identifying options to manage the needs of the network

Our stakeholders saw this as a positive opportunity to increase local engagement and level the playing field between regional organisations and the larger international players. Some stakeholders would like ENWL to provide additional support to smaller players with innovative ideas that require further development.

An important role of the DSO is to signpost forthcoming needs and opportunities, with some stakeholders commenting that ENWL should include the opportunities in the NDP and LTDS documents. Using standard industry tools to identify and assess options

was supported by stakeholders overall, but where there was a perception that ENWL's own bespoke tools are more suitable than industry-standard tools; for instance, the CEM tool needs to be developed to take flexible markets into account. Stakeholders wanted ENWL to publish which tool had been used to assess which network issue so that interested parties had confidence that they have been fully and fairly evaluated. A target to ensure that >90% of network needs are published online, demonstrating which options were considered and the data used to make a decision of reinforcement vs. flexibility were seen as an appropriate measure.

DSO1.3: Sharing of Identifying options to manage the needs of the network				
Purpose & Customer benefits	Measurement points– meets	Evidence for meets	Frequency	Evaluation and verification
To develop open and transparent modelling, procurement and evaluation methodologies and processes that identify current and potential future network needs, publish the information to signpost opportunities and evaluate solution options. Baseline expectation: 1.1.3	Publish predicted network constraints data, monthly from May 2023	Count of predicted network constraint data on website, per month (≥ 90% data shared within pre-agreed timescales averaged over a quarter)	Counts reported quarterly	
	Evaluate options using ROCBA/ WS1A CEM Tool and publish outcome and materials; from April 2023	Publication of evaluation materials and decision report on website per month	Count reported quarterly	
	Publish tenders to seek solution options, bi-annually, including other licensees, cross-sector, energy efficiency programme etc to drive competitive responses; from April 2023	Count of tenders published per quarter with volumes and type of responses (≥ 90% data published within pre-agreed timescales averaged annually)	Counts reported annually	
Context: This encourages the business to develop processes and systems to use the forecasts, to perform network modelling to identify current and potential future network needs; and follow open and transparent procurement and evaluation process to mitigate the network needs				
As is: In ED1 ENWL adopted a Flexibility First principle; ENWL publish Regional Insights document every two years to signpost future network needs and heatmaps to show hosting capacity and current network needs, as well as using ROCBA early in ED1 to evaluate the options.		To be: In ED2 we propose to 1) publish a methodology detailing our approach to identifying needs, 2) publish networks needs openly, 3) enhance ROCBA for solution evaluation and usage alongside the WS1A CEM Tool, 4) publish results and introduce standstill period and Decisions Review process.		





Role 2: Network Operation

Stakeholders agreed that there needs to be a clear distinction between current DNO elements and new DSO elements of the business in terms of roles and responsibilities, as this role was felt to be most aligned with ENWL's current remit. Stakeholders saw this as an exciting vision of the future energy market, although this was intimidating for some. They were keen to take their own actions to help reduce demand and felt reassured knowing that ENWL would be there to support them.

DSO2.1: Sharing constraint information to improve network visibility

Our stakeholders suggested that the sharing of constraint data would not be useful to everyone; whereas it was most likely highly valued by those working in flexibility markets. For those that required this data it should be shared in a dynamic way (for example with API integration) so that it could automatically update users' systems. This seamless integration would bring benefits across the market and would help providers identify opportunities for flexibility. Stakeholders suggested that ENWL should run a satisfaction survey to assess the usefulness of the information and ENWL will need to demonstrate that they are making changes as

a result of feedback from the survey. The survey could be in two stages: a pre-activity dip to understand what format and what information would be most useful to stakeholders, and then a regular satisfaction and usage survey going forward. The survey could be conducted annually to measure the accuracy of the data and relevance to users. As the constraint data won't be useful to all stakeholders, it will be important to ensure the most appropriate groups of stakeholders are interviewed; suggested stakeholders included Local Authorities, ESO, academics, businesses operating in the flexibility markets and trade associations.





DSO2.1: Sharing constraint information to improve network visibility				
Purpose & Customer benefits	Measurement points– meets	Evidence for meets	Frequency	Evaluation and verification
To coordinate and optimise network operations through the sharing of operation data to deliver whole system efficiency savings, and benefits. Sharing allows network users to make informed decisions regarding participation in flexible services markets and how they operate their own infrastructure and prevents reductions in quality of supply. Baseline expectation: 2.1.1	Work with network users to agree quality, format and granularity of constraint data; from April 2023	Publication of report reviewed by DSO SP	Produced in yr 1	
	Publish high level network constraint data daily; from July 2023	Count of constraint data exchanged by licensee, or network user. (≥ 90% data exchanged within pre-agreed timescales averaged quarterly)	Counts reported quarterly	
	Exchange site specific constraint data with licensees, and network users via secure method daily; from July 2023	Count of constraint data exchanged by licensee, or network user	Counts reported quarterly	
	Carry out stakeholder survey to assess the quality, format and granularity of constraint data; from May 2024	Publication of stakeholder survey reviewed by DSO SP	Produced annually	
Context: This approach gives an open and transparent method of sharing this data with customers. Providing historic and actual constraint and curtailment data allows network users to gain the desired visibility of how often their sites have been previously constrained as well as gaining visibility of future curtailment events. With this information they may choose: to operate their sites differently, look to participate in trading of capacity, or request an upgrade in supply security.				
As is: ENWL has developed, through ED1, the curtailment index methodology which provides network users a method to assess the likelihood and impacts of any curtailment they may experience whilst connected to the network.		To be: We will provide historic and actual constraint and curtailment data. We will work with stakeholders to determine how they would like this data to be presented and build the systems and processes to deliver this information in a secure and reliable format.		

DSO2.2: Facilitate efficient dispatch of distribution flexibility services

Developing a decision-making framework was agreed to be a necessity to ensure transparency of decision making and accountability. The framework and DER activity must be fully transparent so that stakeholders, such as suppliers can understand the evidence and reasons for making each decision. A metric could be developed to measure the success of the development and launch, such as engaging with stakeholders to understand their needs, and then asking them how happy they are that their needs have been met.

Stakeholders suggested the analysis of dispatches would be useful to those in flexibility markets to understand future opportunities. This analysis also needs to be consistent across DNOs as those in flexibility markets will be looking at multiple reports from different regions and want reports to be consistent. Sharing of stack information was supported by stakeholders although they will expect some consistency across DNOs to be built into the framework. Open Networks should also be involved in ensuring consistency of both the framework itself and reporting.

DSO2.2: Facilitate efficient dispatch of distribution flexibility services

Purpose & Customer benefits	Measurement points– meets	Evidence for meets	Frequency	Evaluation and verification
<p>To ensure transparency in network operation by engaging with and encouraging network stakeholders to input into decision making processes and procedures. Providing transparency of coordinated and standardised decision-making rules for DER dispatch. This will facilitate scrutinisation of decision making with regards to investment, to ensure that value for money is being delivered. Standardised rules, enables secondary trading of curtailment liabilities and optimisation of utilising flexibility options to improve network reliability.</p> <p>Baseline expectations: 2.2.1, 2.2.2, 2.2.3, 2.2.4</p>	<p>Design, develop, and communicate processes for making decisions with stakeholder input from April 2023</p> <ul style="list-style-type: none"> • Develop and publish rules for DER dispatch by June 2023 • Develop and publish rules for DER coordination by June 2023 • Develop and publish curtailment liability trading rules. Work with industry to specify platform trading arrangements; by September 2023 	<p>Publication of reports reviewed by DSO SP</p>	<p>Produced in yr 1</p>	
	<p>Review annually with stakeholders from April 2024.</p> <ul style="list-style-type: none"> • Review DER dispatch rules • Review DER coordination rules • Review curtailment liability trading rules 	<p>Publication of stakeholders' reviews reviewed by the DSO SP</p>	<p>Published annually</p>	
	<p>Sharing of stack information with users and other licensees to promote coordination of best outcome for whole system. From June 2023 minimum standard is sharing by email</p>	<p>Count of data shared by licensee (≥ 90% data exchanged within pre-agreed timescales averaged quarterly)</p>	<p>Counts reported quarterly</p>	
	<p>Analyse use of dispatch instructions annually, and review approach annually with stakeholders; each year</p>	<p>Annual review report reviewed by the DSO SP</p>	<p>Published every year after yr 1</p>	

Context: This encourages the business to encourage wide ranging stakeholder input into our operational decision-making processes, particularly in operational timescales, something that we have historically not done. But as we change the way that we operate the network stakeholder feedback needs to remain at the heart of everything we do. A key aspect of network operation is ensuring that we are supporting stakeholders to make educated decision making. Within our stakeholder engagement activities, it should be demonstrated that we are leading and facilitating our stakeholders to decarbonise their own utilisation of energy. Flexibility market operation is a completely new element of DSO, which is going to be developed predominantly through the final years of ED1 and throughout ED2.

As is: Currently there are no processes or procedures as business as usual for this activity.





To be: Regular opportunities to allow the discussion with our stakeholder groups will be presented, allowing us to share our proposals for development of solutions and for them to influence our ongoing workplan. Stakeholders will be asked how they would like data to be presented to them, the transparency of our processes and procedures, and allow them to reflect of the value for money that the solutions we utilise deliver.

DSO2.3: Network coordination between the ESO and DNOs to reduce the overall system operation cost

This was difficult for most stakeholders to respond as they don't necessarily have a view of ESO / DNO interactions. They also felt that the systems for coordination between ESO and DNOs need to be designed and developed before they can be measured. Any systems, activities or metrics must be developed in partnership with ESO and be coordinated through the ENA working group to ensure consistency.

Some stakeholders felt that setting a target for delivering the data would appear to put too much pressure on the ESO to act on the information and doesn't include the two-way nature of the relationship between ESO and DNO. Measuring the volume of data delivered on time misses measuring the usefulness of the dataset and stakeholders would rather this metric focuses on how actionable the data is in terms of how many decisions or activities have been influenced by the data sharing.

DSO2.3: Network coordination between the ESO and DNOs to reduce the overall system operation cost

Purpose & Customer benefits	Measurement points– meets	Evidence for meets	Frequency	Evaluation and verification
To coordinate and optimise network operations through the sharing of operational data to deliver whole system efficiency savings, and benefits. Sharing allows the ESO to make informed decisions regarding dispatch of flexibility services and how they operate their own services, operate the transmission, and prevents reductions in quality of supply. Baseline expectations: 2.1.2, 2.1.3, 2.1.4	Agree with the ESO which data (format, quantity, granularity, latency) from the Data Catalogue will be shared	Publication of engagement report and actions reviewed by DSO SP	Produced annually to show improvement	
	Exchange constraint data via ICCP link in CIM format daily	Count of constraint and dispatch data exchanged by licensee (≥ 90% data exchanged within pre-agreed timescales averaged quarterly)	Counts reported quarterly	
	Share historical operational data, and outage planning data via secure link as agreed by stakeholders (eg monthly)	Count of DER utilisation, and outage planning data exchanged by secure link	Counts reported quarterly	
	Share real time and near real time operational data, frequency to be agreed with the ESO (eg daily)	Count of real time and near real time operational datasets shared (≥ 90% data exchanged within pre-agreed timescales averaged quarterly)	Counts reported quarterly	

Context: This performance metric drives the business to share a greater range and quantity of operational data with the ESO and facilitates the ESO input into our decision-making processes, particularly in operational timescales, something that we have historically not done.

As is: In ED1 operational data exchanges are limited to planned and unplanned network outage events at the boundaries between network operators; predominantly carried out using manual communication methods i.e telephone calls & emails.

To be: In ED2 to promote improved whole system collaboration and optimisation of network operation it will be necessary to share significant levels of operational data in near real time, as well as short to medium timescales. The work in ED2 will be to establish a range of communications methods to collect and transfer the necessary operational data in an appropriate timescale with sufficient data privacy and cyber security protocols. Regular opportunities to allow the discussion with the ESO will be presented, allowing us to share our proposals for development of solutions and for them to influence our ongoing workplan. The ESO will be asked how they would like data to be presented to them, the transparency of our processes and procedures, and allow them to reflect the value for money that the solutions we utilise deliver.

Role 3: Market development




Stakeholders saw this role as highly appropriate for ENWL to be leading on as a DSO function, with most stakeholders expecting ENWL to be undertaking the activities necessary for this role already. There was an appreciation that the level of activity will increase exponentially as flexibility providers become more commonplace over the coming years. Stakeholders expect markets to be simple to interact with from both a business / public sector and consumer perspective.

Smart meters were seen to be key for domestic customers by enabling them to track their usage and generally engage more with their energy supply. Stakeholders also felt that smart meters were an important tool for the DSO to track demand and manage when to switch assets / flexibility services on and off. Some stakeholders admitted they hadn't previously fully appreciated the benefits of smart meters and thought that ENWL should be making more effort to communicate about meters.

DSO3.1: Efficient, user-friendly and accurate processes, contracting and procurement

As with Role 2, stakeholders commented that all contracting and procurement processes need to be fair in terms of access granted to flexibility markets, no matter what the size of the organisation. Stakeholders are keen that smaller organisations, and local companies are given equal or even preferential access to markets. Some stakeholders expect ENWL to prove that they can operate a truly fair and neutral market and sharing information will help here.

Stakeholders felt that this need for fairness poses a big challenge to the entire industry as the market is not currently a fully open market. To prove ENWL was acting fairly stakeholders suggested ENWL run a customer satisfaction survey to ensure processes are working efficiently.




DSO3.1: Efficient, user-friendly and accurate processes, contracting and procurement				
Purpose & Customer benefits	Measurement points– meets	Evidence for meets	Frequency	Evaluation and verification
To work with industry to develop and implement standardisation across DFS products, contracts and processes for market liquidity and coordination for whole system outcome. This includes the provision of data for secondary trading and driving innovation in marketplace platform provision and services. Baseline expectations: 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5	Work with DER providers to ensure arrangements meet ESO and DSO needs, highlighting evidence that stakeholder input has guided the outcome by September 2023	Publication of engagement report and actions reviewed by DSO SP	Produced annually	
	Work with industry and ESO to develop aligned products and processes that enable coordination and DFS liquidity by March 2024	Publication of status report reviewed by DSO SP	Produced annually	
	Seek quarterly stakeholder feedback on efficient, user-friendly and accurate processes, contracting and procurement, starting; from April 2023	Published engagement report and actions reviewed by DSO SP	Produced annually	
Context: This encourages the business to develop systems and processes for developing and implementing standard products and contracts and standard procurement and settlement processes for DFS, including the sharing of data to 1) coordinate the use of DFS and 2) facilitate secondary trading. This is a new area for DNOs.				
As is: In ED1 in the ONP the DNOs developed the framework for new products and contracts, best practise for procurement, baselining and settlement of DFS.		To be: In ED2 we will continue to work with other DNOs and industry driving innovation and standardisation, using common platforms for the co-engaging with stakeholders and market participants through ED2.		

DSO3.2: Flexibility Market Volume and Value: Delivering stakeholder engagement and sharing market information

Most stakeholders welcomed the focus on engagement and the actions that ENWL is planning to take to fulfil this role, such as the publication of market information. This information could be very useful if in real time and stakeholders saw this as a good opportunity to customers and flexibility market players. A portal would be useful so that users can decide for themselves how much market information they need to access. Some stakeholders felt that the DSO isn't as well placed to give advice to customers as suppliers, noting that it's a fine line between advertising / communicating flexibility markets and helping

customers take part in them. Inclusivity was highlighted as very important in any programme of engagement as it needs to encompass all sectors and local regions. It was suggested that ENWL should tailor engagement to different participant types including: asset types, company types and to those with differing levels of understanding of technology markets. Some stakeholders requested that the market information be published in a standardised format across DNOs to make it easier to digest by stakeholders with a national remit.

DSO3.2: Flexibility Market Volume and Value - Delivering stakeholder engagement and sharing market information

Purpose & Customer benefits	Measurement points– meets	Evidence for meets	Frequency	Evaluation and verification
<p>To develop stakeholder/ market participants engagement plan and develop and publish comprehensive market information, guided by feedback, with the aim of continuously improving the data and information shared.</p> <p>Baseline expectations: 3.1.1, 3.1.2, 3.1.3, 3.1.4</p>	<p>Publication of volumes (by product and capacity) of: Needs, tendered, purchased, and utilised / dispatched flexibility services & flexible connections; from May 2023 on a quarterly basis</p>	<p>Publication of volumetric reports and DFSP statement and report</p>	<p>Published quarterly and DFS procurement statement and report produced annually</p>	
	<p>Develop and deliver engagement strategy to understand stakeholders' / market participants' data and information; by June 2023:</p> <ul style="list-style-type: none"> Tailor engagement and data/information sharing by participant type. Understand requirements to drive provision that is of the right quantity, quality and granularity including easy to read, and use, at right frequency and in the right formats etc. Uncover data requirements that support market development. Develop processes and systems to share data in machine readable formats 	<p>Publication of engagement and data requirements reports reviewed by DSO SP</p>	<p>Produced annually</p>	
	<p>Publish:</p> <ul style="list-style-type: none"> anonymisation rules and logic; by June 2023 curtailment values by April 2024 'forecast' heatmaps to show opportunities, quarterly from June 2023 and monthly from 2026 tenders for solutions, 2-3 years in advance for energy efficiency opportunities from September 2023 	<p>Publication of compliance reports reviewed by DSO SP</p>	<p>Produced annually</p>	

Context: This encourages the business to develop systems and processes for engaging with stakeholders and market participants through ED2, to improve the information and data sharing to develop the market and improve its liquidity.






As is: This is a new area for DNOs; initially in ED1 we published information required by the new SLC 31E i.e DFS Procurement Statement and DFS Procurement Report.

To be: In ED2 we propose to 1) comply with SLC31E reporting requirements, 2) develop an engagement strategy and plan, 3) understand our stakeholders' data/information requirements and deliver them, 4) continuously improve our market information through an annual review and compliance process.

DSO3.3: Managing conflicts of interests and open governance

Some stakeholders were cynical about ENWL's ability to be completely neutral, whereas others had a more optimistic view and believed ENWL would be able to embrace the necessary changes. Stakeholders commented that it is important here to demonstrate transparency and lack of conflict by separating defining roles and responsibilities of the DNO and the DSO parts on the business. Stakeholders felt that ENWL will need to clearly define what determines a conflict of interest before this can be measured, so publishing clear definitions and the outcomes of any identified conflicts of interest will encourage positive customer and stakeholder perceptions.

It was suggested that a completely independent body should be created to oversee governance and conflicts of interest; with one stakeholder commenting that it should be a community interest social enterprise. It was felt there was much overlap with the bespoke performance metric, 'promoting transparency and oversight', with stakeholders liking the additional detail on how governance structures will be adapted to DSO, so these were included within this metric

DSO3.3: Managing conflicts of interests and open governance				
Purpose & Customer benefits	Measurement points– meets	Evidence for meets	Frequency	Evaluation and verification
<p>To develop systems and processes for managing conflicts of interest to ensure the DNO truly act as a neutral market facilitator.</p> <p>Baseline expectations: 3.2.5</p>	Create DSO Compliance Officer role to ensure compliance with published processes and methodologies; appointment by April 2023. Produce an annual compliance report and compliance report produced from April 2024	Engagement report highlighting feedback and indicating process amendment to strengthen separation and better manage conflicts. Compliance report produced annually by DSO CO, reviewed by DSO SP	Produced annually	
	Form and empower a DSO Stakeholder Panel to: review methodologies, review decisions, make recommendations to change or where appropriate overturn decisions when justified, by May 2023	Formation of DSO SP and publication of compliance report reviewed by DSO SP	Produced annually	
	Engage with stakeholders to explain measures to actual and perceived manage conflicts of interest and gain feedback by September 2023	Engagement report highlighting feedback and indicating process amendment to strengthen separation and better manage conflicts	Produced annually	
	Undertake an annual DSO compliance audit; from May 2024	Compliance report produced annually by DSO Compliance Officer, reviewed by DSO SP	Produced annually	
	External audit review from RIGs auditors from May 2024	Audit report reviewed by DSO SP	Produced annually	
<p>Context: This encourages the business to develop open and transparent processes so that all stakeholders have confidence that the business is truly acting as a neutral market facilitator by removing or mitigating the conflicts of interest.</p>				
<p>As is: In ED1 we published information required by the new SLC 31E ie DFS Procurement Statement and DFS Procurement Report.</p>		<p>To be: In ED2 we propose to 1) signpost early opportunities for solution option providers, 2) engage with stakeholders to review approach for optimal contract length, 3) create a separate DSO directorate and engage with stakeholders on managing conflicts of interest, 4) appoint a DSO Compliance Officer and report compliance annually, and 5) create a DSO Stakeholder Panel.</p>		

9. Appendices

Key Information

In this section we delve into the detail of the three important initiatives of the DSO Stakeholder Panel, network monitoring and energy efficiency; as well as providing a mapping table that links the initiatives and activities to deliver the baseline expectations and detailing granular information on the delivery milestones for all the activities described in this DSO Transition Plan. Finally, a glossary is provided to aid understanding of the words, terms and phrases used throughout the document.

9.1 DSO Stakeholder Panel Terms of Reference

Key Information

We plan in RIIO-ED2 is to set up an independent oversight body to ensure that our stakeholders and customers have a say in the scope and speed of the transition to distribution system operation. In this section we have drafted an initial outline of the terms of reference for the independent oversight body, which we have called the DSO Stakeholder Panel.

Terms of Reference (ToR) for DSO Stakeholder Panel

1. Background

In summer 2020 Electricity North West published and consulted on a refreshed DSO Strategy. It was clear from the feedback that our stakeholders want to continue to input to and guide our DSO Transition.

2. Role of the DSO Stakeholder Panel

The Electricity North West (“ENWL”) DSO Stakeholder Panel (“Panel”) is a committee made up of independent individuals covering the broad spectrum of DSO stakeholders for the purpose set out in these ToR. The primary purpose of the Panel is to provide insight, independent oversight, challenge, review and guidance on ENWL’s ongoing DSO activities. To fulfil its role, the Panel will develop the criteria to assess its performance, effectiveness, and overall contribution and report, at least annually, on the delivery its primary purpose. ENWL will use 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.

3. Scope and Objectives

3.1 The Panel has the following scope:

- To represent the diverse needs and viewpoints of ENWL’s DSO stakeholders,
- To guide ENWL’s engagement with its DSO community, ensuring stakeholders are appropriately engaged, noting that the Panel is not a substitute for wider stakeholder engagement and consultation,
- To guide ENWL’s approach to open data access for all stakeholders and specifically network users, subject to privacy and confidentiality constraints; including what data, in what format, delivered where and at what frequency whilst complying with relevant industry codes and statutory obligations,
- To operate independently of the ENWL executive leadership team but to assist the executive in its considerations and decision making on DSO, noting that the Panel has no decision-making powers and ENWL remains accountable and responsible for the DSO strategy and delivery, and
- To inform ENWL of DSO developments outside of the ENWL organisation, including potential insights from around the world sharing best practice to guide ENWL’s DSO strategy and activities.

3.2 The Panel has the following objectives:

- To assist ENWL in its activities to enable Net Zero at optimum cost with due consideration of other ENWL strategies such as the Workforce Resilience and Diversity and Inclusion strategies and wider customer and stakeholder needs,
- To provide appropriate oversight, challenge, review and guidance on ENWL’s DSO activities,
- To act as the review body of proposed decisions that have been challenged by an affected third party, and make recommendations on rejecting or upholding the challenge and where appropriate make recommendations to change a process or methodology,
- To act as the review body for DSO forecasting, modelling and decision-making methodologies; and where requested make recommendations to change relevant methodologies, and
- To monitor, evaluate and verify the ongoing performance of the DSO Transition using the measures of success as agreed as part of the RIIO-ED2 final determination supported by evidence gathered from the DSO community in accordance with Ofgem’s performance framework and guidance.

3.3 In most instances, the Panel shall meet its objectives through making recommendations as appropriate to those responsible for the management and/or delivery of DSO activities across ENWL.

4. Functions

4.1 The Panel has the following functions:

- To periodically review, at least once every two years, and discuss ENWL's DSO strategy, transition plan and ongoing activities and the appropriateness and adequacy of the DSO strategy,
- To provide a forum for discussion and, where necessary, recommendations for improvement to DSO stakeholder engagement, data and data access, methodologies and decision-making processes and ongoing delivery performance related to ENWL's DSO transition; and specifically:
 - To undertake a decision review process where the Panel makes a recommendation on the proposed investment decisions challenged by third parties, and
 - To undertake a methodologies review process where the Panel, on request, reviews the methodologies used in forecasting, modelling and network planning and, as appropriate, make recommendations to improve the approach.
- To review, evaluate and verify the performance and compliance reports presented to the Panel on an ongoing basis and discuss, as appropriate, areas for improvement, and
- To consider reports, guidance notes and other relevant information provided by Ofgem, HM government or independent bodies that may have potential to affect ENWL's DSO activities and strategy.

5. Authority

5.1 The Panel is authorised to make recommendations to colleagues with responsibility for making decisions regarding ENWL's DSO activities.

5.2 The Panel shall have no executive powers regarding its recommendations.

5.3 The Panel is authorised to obtain information required to fulfil its objectives as outlined in these terms of reference, and to facilitate effective discussions with nominated ENWL DSO representatives.

5.4 The Panel is not authorised to obtain information if:

- it would be against the interests of national security or against the law;
- it is about an individual or body who has not given their permission for it to be given out;
- it would cause substantial injury to the organisation, or if supplied by someone else, to the business of that person; or
- the information has been obtained for the purpose of any legal proceedings.

5.5 The Panel will not review or discuss any issues that are subject to any commercial or any legal restrictions.

6. Membership

6.1 The Panel shall comprise a Chair and up to twelve representatives from the following areas:

Flexibility Provider x1	Aggregator x1	Generator x1
Supplier x1	Academia x1	Storage operator x1
Local Authority x1	Community & Local Energy x1	Consumer Protection Party x1
IDNOs x1	System/Network Licensee x1	Independent x1

6.2 Additionally two representatives from ENWL will be nominated as Panel Members.

6.3 The Panel will be led by an independent Chair, initially appointed by ENWL. Once the Panel has been established any changes to the Chair must be endorsed by the Panel members and the ENWL DSO Director. In the absence of the Chair the Panel members present shall elect one of themselves to chair the meeting.

6.4 Membership of the Panel shall normally be reviewed biannually. Each Panel member shall normally serve on the Panel for two years but to ensure continuity at the end of each two-year period only half of the Panel members will be up for reappointment. A Panel member may serve multiple terms.

7. Quorum

7.1 The quorum necessary for the transaction of Panel business shall be eight members, where one member must be a nominated ENWL DSO representative.

8. Secretariat and support

8.1 ENWL will procure, on behalf of the Panel, secretarial resources to allow the Panel to discharge its activities. The secretarial resources secured by ENWL shall not be a member of the Panel and shall not cast a vote.

8.2 The DSO Compliance Officer shall attend the Panel meetings to support the workings of the Panel.

8.3 ENWL subject matter experts and external advisers may be invited to attend meetings of the DSO Stakeholder Panel as appropriate.

8.4 The secretariat will also support the Panel in communicating with internal or external parties such as other ENWL Panels, market participants, trade associations, Regulators, or government etc. Panel members may be approached by the press or requested to speak at public events on behalf of the Panel. This must be discussed with the Chair and the ENWL DSO Director before agreeing to respond or comment.

9. Conflict of interest

9.1 A person appointed as a Panel member shall act impartially and in the best interests of all stakeholders and customers, in line with the requirements on ENWL as a regulated DNO.

9.2 At the start of every Panel meeting a Panel member must declare any actual or perceived conflict of interest. The ENWL DSO representative shall decide the most appropriate course of action with the conflicted Panel member absenting themselves from the Panel's deliberations and/or any vote in relation to the area of conflict.

10. Decisions

10.1 At least 80% of the present Panel members must agree any recommended outcome when reviewing investment decisions challenged by third parties or recommended changes to methodologies.

10.2 At least 80% of the present Panel members with voting rights, with a minimum number of five, must agree any recommended outcome when reviewing investment decisions challenged by third parties or recommended changes to methodologies. The Panel may wish to make representations to Ofgem as part of their deliberations when considering changes to methodologies employed by ENWL.

10.3 Panel members must declare any conflicts of interest when requested to review challenged decisions. Where this happens the Panel member will be excluded completely from the decisions review process and voting.

11. Meetings

11.1 The Panel shall normally meet four times each year. Additional meetings may be arranged by exception as dictated by ENWL DSO activities.

11.2 A forward programme of indicative meeting dates and times will be agreed on at least a six-month rolling basis. At the end of each meeting the date and time of the next meeting will be agreed by the Panel; including any additional meetings required between normal quarterly Panel meetings. A notice detailing the venue, time and date of each meeting together with the agenda of items to be discussed, shall be forwarded to each member of the Panel, and any other person required to attend, no later than 5 working days before the date of the meeting. Supporting papers shall be sent to Panel members and to other attendees as appropriate, at the same time.

11.3 Where the Chair decides an additional meeting is necessary the secretary will propose potential dates and times to maximise the attendance of Panel members, above the quorate number.

11.4 Members may place items on the agenda up to 10 working days before the date of the meeting. Materials shall be circulated 5 working days in advance where materials are required.

11.5 The secretariat shall record the names of those present and in attendance and the agreed actions of all meetings of the Panel.

11.6 The agreed actions of the meetings shall be circulated promptly, and not later than 5 working days after the meeting, to all members of the Panel. As appropriate, summary reports of the Panel's feedback and recommendations will be published on the ENWL website. Where necessary to preserve confidentiality or commercial sensitivity the Panel's reports shall be redacted, with the redactions agreed with Panel members.

12. Expenses

12.1 The Panel must ensure that it retains its independence from ENWL but recognises that costs may be incurred by Panel members in discharging its activities.

12.2 The level of compensation available to Panel members in performing their responsibilities as part of the Panel are:

- The Chair and the Panel members of the DSO Stakeholder Panel will be paid by ENWL, and
- All Panel members can claim reasonable costs and expenses incurred in attending meetings or otherwise conducting Panel business. This can include payment for time spent outside of Panel meetings representing the Panel, if agreed by the Chair and ENWL and is fully disclosed by the Panel in advance.

13. Terms of Reference review

13.1 ENWL and the Panel recognises that the DSO transition is dynamic in its nature and that it will need to review the agreed ToR to ensure the Panel can respond to market changes or regulatory policy.

13.2 A formal review of the ToR will be completed on an annual basis by the Panel, with the support of ENWL DSO representatives. Any changes to the ToR shall be accepted when the Panel and the ENWL DSO representatives unanimously agree.

13.3 Changes to the ToR can be proposed by a Panel member at any time and will be incorporated into the annual review unless the Chair believes the matter is urgent.

14. Confidentiality

13.1 The Panel shall produce notes which will reflect the views of the Panel. These notes will be agreed by the Chair of the Panel. In so far as the Panel reaches a conclusion the Panel members will uphold collective decision making.

9.2 Network monitoring initiative

Key Information

Our aim in RIIO-ED2 is to release capacity in our HV and LV networks by investing in network monitoring to accurately measure and record how the networks are operating over time. This enables us to enhance HV heatmaps and produce LV heatmaps that we can use to signal to our customers and stakeholders the congested and underutilised areas of our network, for minimising the costs of connection to the network and maximising the opportunities for flexibility services or energy efficiency programmes instead of network reinforcement.

Background

We currently have extensive monitoring on EHV networks and on HV feeder heads; this data is shared via the Long Term Development Statement, used to report Load Indices and to create heatmaps. Currently monitoring is sparse in HV and LV networks, with only several hundred distribution substations, out of a population of thirty four thousand, fitted with monitoring equipment. Our DFES 2020 analysis shows that the current network demand and capacity, plus headroom in the network at the transformation levels are as follows:

Figure 9.1: Network demand compared with network capacity, disaggregated by transformation level

	EHV	BSP	Primary	Distribution
Peak demand	4,312 MVA	4,122 MVA	4,045 MVA	3,900 MVA**
Network capacity	8,771 MVA*	5,639 MVA*	8,290 MVA*	10,260 MVA
Available capacity	4,558 MVA	1,516 MVA	4,046 MVA	6,360 MVA

*Firm capacity

**Estimated by Maximum Demand Indicator readings

These show that overall there is a substantial amount of capacity available across the voltage levels in Electricity North West's network that can be used for the connection of LCTs. However, this one-dimensional metric of network utilisation hides regional, zonal and temporal differences as some areas e.g. city centre Manchester has seen significant connections activity and has little or no current headroom. Our [Regional Insights 2021](#) document provides further details, where there is available capacity at the primary, BSP and GSP transformation network levels. Throughout RIIO-ED2' we will release capacity through our proposed energy efficiency initiatives (see Section 9.3) which encourages domestic and commercial customers to be energy efficient.

Our approach in ED1

Our innovation work in DPCR5 and RIIO-ED1 has shown how monitoring and analysis can enable significant additional capacity to be released using existing assets customers have already paid for; this was an innovation theme and is now embedded as business as usual. Our Connect and Manage approach adopted in RIIO-ED1 exemplifies this approach and shows how we maximise the use of existing LV assets for our customers. In Year 6 of RIIO-ED1 we have reported in Table E6 of the Environment and Innovation Report of our Annual RIGs submission that we had avoided over a million pounds of network reinforcement through this approach.

Knowing how valuable network usage data is for operating a smart and flexible network, in RIIO-ED1 we also took the decision to install low cost monitoring on targeted areas of our HV overhead network and at high customer population distribution substations to obtain a clearer picture of how our networks were operating. Our primary aim was to obtain network usage data giving us a better understanding of how customers were using our networks, particularly for those circuits that have connected LCTs. By the end of RIIO-ED1 we expect to have installed:

- LV monitoring on 3,531 of the most populous ground mounted substations that supply electricity to about 1.024 million customers (around 43% of connected customers), and
- HV monitoring on 100 circuits on the overhead network, where the network loading is uncertain and highly variable.

The key benefit of network usage data is understanding the current utilisation of our assets as it enables us to better identify and signal available capacity in our networks as well as manage constraints. Further information on the use of the data from installed monitoring devices is included in Annex 1 - Use Cases below.

In selecting the type of monitor to install in our LV network, we have taken a long term view of the impact of LCTs on phase imbalance, neutral current loadings and harmonics as well as more common network voltage and phase current flow. This additional information in the phase and neutral conductors will supplement the consumption data from smart meters. Due to the delays and issues in the national smart meter rollout we only expect to have up to 70% of our domestic customers with smart meters at the end of RIIO-ED1. Aggregated smart meter data only shows the average current flows in the phase conductor and therefore provides a relatively coarse and simple view of phase conductor thermal capacity. The current flow in the neutral conductor is the factor that defines the maximum number of LCTs that can be safely connected to the network as its cross-sectional area is half the size of a phase conductor. It is of note that LCTs often produce highly unbalanced loading conditions highlighting the importance of neutral conductor monitoring. Installing advanced LV and HV network monitoring provides real and reactive power flows (i.e. four quadrant metrics) and network voltage. Further information on the LV network monitoring solution is contained in Engineering Justification Paper 9 – LV Network Monitoring. Figure 9.2 below shows the data we intend to collect from the monitoring equipment. Further information on understanding and managing observability issues from the data from installed monitoring devices and smart meters is included in Annex 2 – Understanding and managing observability issues below.

Figure 9.2: Measurement information recorded by the monitoring equipment

	Measurements*		
	Current	Voltage	General
LV monitoring equipment	Half Hourly phase current x 3 and Half Hourly neutral current	Half Hourly voltage x 3	Asset health measurement
HV monitoring equipment	Half Hourly phase current x up to 3	Half Hourly voltage x 1	Asset health measurement, Low clearance identification, Volt drop alarm.

*Sampling rate of every second average up to 30 mins.

Our proposed approach in RIIO-ED2

We will continue using aggregated smart meter data to monitor the loading on the network but we will also continue tactical installation of HV and LV monitoring equipment in RIIO-ED2 to provide us greater visibility with the aim of delivering savings to our customers.

For LV network monitoring we aim to install equipment on another [redacted] ground mounted substations, again selecting the most populous substations to ensuring the widest coverage of monitoring across the connected customer population. This means that in ED2 we will have LV monitoring covering 95% of our connected customers. We expect to have data for the network supplying the remaining 5% of customers from smart meters, or if this is not available due to the issues with the rollout and acceptance of smart meters we will model these networks using actual data from similar networks.

For HV network monitoring we aim to install equipment on another [redacted] circuits.

Figure 9.3 below summarises the costs and the benefits of installing HV and LV monitoring.

Figure 9.3: Summary of costs and benefits for HV and LV monitoring

Network level	Costs	Benefits	Selection methodology
LV	Total £20.6M, [redacted]	<ul style="list-style-type: none"> Signal to developers of low cost connection opportunities; reducing connection costs 	Most populous ground mounted substations/ circuits
HV	Total £25M, [redacted]	<ul style="list-style-type: none"> Signal to aggregators/ flexibility providers of opportunities; reducing the cost of procuring flexibility services Signal potential opportunities for solution providers; reducing solution costs 	Longest circuits with highly variable loadings and/ or generation

As part of our innovation work we will pursue developing low cost monitoring for pole mounted substations again to provide us greater visibility as to the use of the network and customers' behaviours using LCTs.

Summary

By the installing monitoring equipment on selected HV and LV networks in RIIO-ED2 we will release capacity for use by our customers through improved understanding the of utilisation of our current assets. With significant increases in demand forecast during the ED2 period, this is critical for our continued efficient network development saving DUoS customers money through deferred or avoided reinforcement.

Annex 1 - Use cases

We will use the half hourly current and voltage readings for each phase (and for LV networks only, the neutral conductor) from the monitoring equipment to provide information on the how the network is operating in real time and to generate insights for the planning and future development of the network.

1. Publish raw data

Real time network management

It is possible to publish the real time half hourly data collected from the monitoring equipment for the real time management of our network. However, we are unsure whether this would be useful and valuable to our stakeholders so we will be guided by the DSO Stakeholder Panel on how to publish this data.

We will collect current and voltage readings for each phase to monitor the operation of the network. Network management tools will manage the network flows ensuring that no parts of the network are overloaded or when a fault occurs, the faulty section is isolated, and where possible the network is reconfigured and supplies to customers restored. The data collected populates a network connectivity model within the Network Management System or its applications; for example, techniques such as ANM, Smart Street, FLISR, QUEST etc are enabled by the provision of network usage data.

Opportunities	Benefits	Action
Unknown	To be determined	Seek guidance from DSO Stakeholder Panel in ED2

2. Generate loading information and publish heatmaps for efficient network use

Analysis for network development

In planning timescales, we will analyse the half hourly current and voltage readings for each phase (plus for LV networks only, the neutral conductor) and calculate specific information to understand how the network is operating over time. For example, we use the collected data to:

- Analyse and compare phase currents against the phase capacities to understand phase imbalance,
- Calculate minimum and maximum demands on the network with accompanying date and time stamps to understand operating range of the networks, and
- Compare with network capacity to calculate and publish available headroom in the form of a heatmaps to signal opportunity to connect or provide flexible services /energy efficiency.

Opportunities	Benefits	Action
1. Visibility of available headroom	1. Signal to developers low cost connection opportunities; reducing connection costs	Publish HV and LV heatmap information and accompanying data tables, updating quarterly
2. Visibility of network congestion	2. Signal to aggregators/ flexibility providers opportunities; reducing the cost of procuring flexibility services	

Prior to the DSO Stakeholder Panel assisting us to decide whether to publish all the raw data we will provide, on request, the half hour data for defined sections of network.

3. Publish information and insights to encourage efficient solutions

Analysis for network development

The analysis of the loading data generates additional information on the current usage of the network and potentially identifies network issues that may require rectification. In previous price controls an asset solution would have been developed from this analysis. As granular data becomes available our approach will change as we look to third parties to generate potential solutions, whilst we develop the asset intervention solution primarily as the counterfactual for the evaluation and solution selection stage.

For example, we could potentially find on LV and HV circuits:

- Loading imbalance across the phases,
- Excess current flows neutral conductor,
- Reverse power flows, etc.

Publishing this information would encourage customers, other DNOs, embedded IDNOs, aggregators etc to come forward with as wide a range of potential solutions as possible to remedy the problem; and the solutions would be evaluated as normal using the Whole System CBA, CEM or ROCBA tools. This would aid our commitment to encourage participation in the operation of the network from as many individuals and organisation as possible.

Opportunities	Benefits	Action
Visibility of network issues	Signal opportunities for solution providers, reducing solution costs	Publish network problems and accompanying data tables, updating initially bi-annually

4. Publish forecast information and insights to encourage efficient interventions

In RIIO-ED2 we will run simulations on HV and LV networks using the loading forecasts derived from the collected data and generated from the ATLAS methodology to identify the volumes and locations of potential network needs for the next 10 years. This enables stakeholders to understand the range and scale of the potential network needs in the future, based on our current forecasts and would be published in Long Term Development Statement and Network Development Plan formats.

Opportunities	Benefits	Action
Visibility of forecast network issues	Signal potential opportunities for solution providers; reducing solution costs.	Publish forecast volumes of network problems and accompanying data tables, updating initially bi-annually.

Annex 2 - Understanding and managing observability issues

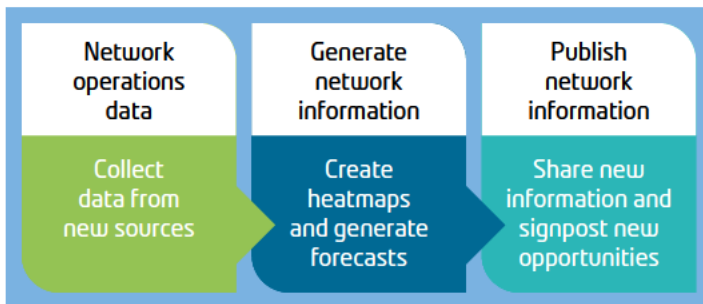
Background

In Section 5.1 we highlight that in addition to smart meter data we intend to gather measurement data from both LV and HV networks through the further installation of distributed monitoring equipment. With this significant increase in data we face numerous challenges processing and sharing it. We currently face many of these challenges, albeit at a much smaller scale, and so this section explains how we will manage those challenges in the future.

Increasing network visibility

Throughout the DSO Transition Plan Annex we have declared our commitment to openly share data and Figure 9.4 shows how we intend to collect data, how we use the data to create insightful information on the future needs of the network, and what we will do to promote this to encourage third parties to come forward and offer solutions to the network's needs.

Figure 9.4: High level process showing transformation of data into information



The combination of smart metering, third party data and new network monitoring equipment provides data on the operation of our networks, giving the opportunity to:

- Create and share heatmaps showing utilisation and available capacity at all voltage levels enhancing existing heatmap creation processes
- Generate forecast information on utilisation, capacity and potential constraints enhancing world class forecasting methodology, ATLAS
- Seek solutions from third parties to solve network constraints and promoting flex market development, and.
- Better inform operational network decision making and facilitate the utilisation of increased network automation to maximise the potential benefits of flexibility and unlock existing underutilised network capacity

Our work in RIIO-ED1: Figure 9.5 below illustrates that by the end of RIIO-ED1 we expect to have installed LV monitoring equipment on 15,000 LV feeders and as we will be targeting those distribution substations that contains the most number of customers we expect to collect data on the networks that supply electricity to around 1.024 million, or 43%, of all connected customers. At this point in time we only expect to have up to 70% of smart meters fitted and these will be randomly spread across the whole of the LV network.

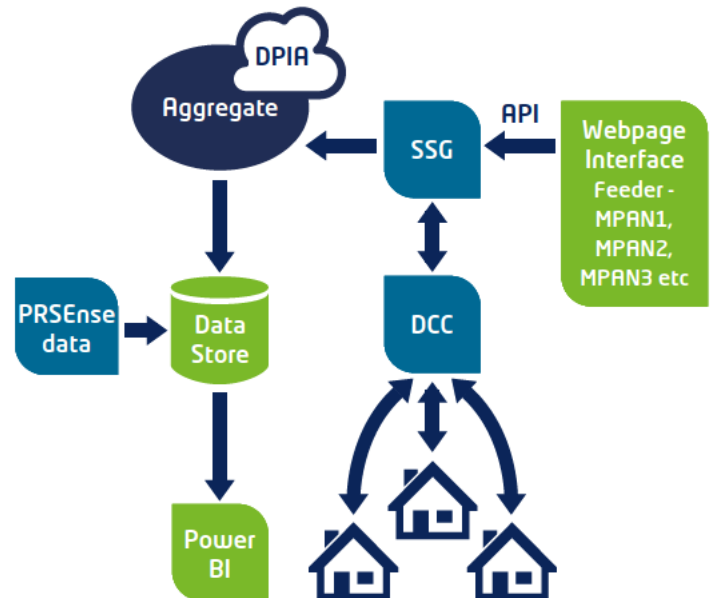
Figure 9.5: Estimated ED1 volume of customers covered by smart meters and network monitoring

	End of RIIO-ED1	Customer coverage
LV monitoring equipment	3,531 distribution substations or 15,000 LV circuits	1.024 million or 43%
Smart meters	Up to 1.68 million	Up to 1.68 million or 70%

In early 2021 Electricity North West submitted a Data Privacy Statement and were successfully granted permission to access domestic customers' smart meter consumption data in April 2021.

The smart meter data will be gathered from the Data Communications Company (DCC), as shown in Figure 9.6 Connectivity data from our internal GIS and Network Management System (NMS) systems can show all MPANs connected to an LV feeder, secondary substation and HV feeders. Network connectivity data will feed, via a web interface (API), into the Smart Service Gateway (SSG); this is our corporate system that is used to communicate with all devices in the network. The SSG will then request to extract from the DCC the consumption, export, and voltage quality data (ie, alerts for under/over-voltages) from the associated smart meters for all MPANs on the specified secondary substations / LV feeders

Figure 9.6: System architecture for the collection and combined use of smart meter and LV monitored data



As shown in Figure 9.6, before being stored in our corporate system, the smart meter consumption data will need to be anonymised and aggregated. Similarly, the voltage quality data will be processed to flag over/under-voltage issues per LV feeder / secondary substation. The anonymisation of the smart meter data will be in line with the Data Privacy Impact Assessment (DPIA) paper that has been reviewed and approved by Ofgem. The aggregated and processed half-hourly smart meter data will be held in the Data Store.

Measurements from each of the of secondary substation feeders will be also recorded and kept in the Data Store. Specifically, half-hourly averages of per LV feeder and per phase loading of active and reactive power, as well as currents and voltages, will be stored.

We will utilise existing market ready data manipulation and presentation platforms (e.g Microsoft Power BI) to not only visualise data, but importantly be the interface with planning engineers to access and process the big data. This includes the extraction of datasets in formats (eg, csv/txt files) that can feed into the working tools of engineers and analysts to assess network impacts and select targeted, cost efficient interventions.

Our proposal for RIIO-ED2: By the end of RIIO-ED2 these numbers will significantly increase as we expect to install LV monitoring equipment on a further [redacted] distribution substations, again targeting those distribution substations that contain the most number of customers. We expect to collect data on the networks that supply electricity to around 2.28 million, or 95%, of all connected customers. Alongside these monitors we estimate that there will be >95% coverage of smart meters.

Figure 9.7: Estimated RIIO-ED2 volume of customers covered by smart meters and network monitoring

	End of RIIO-ED2	Customer coverage
LV monitoring equipment	[redacted] distribution substations or [redacted] LV circuits	2.28 million or 95%
Smart meters	>2.3 million	>2.3 million or >95%

Managing and analysing the data to overcome observability issues

The increase in data that DNOs will have in the future creates a significant challenge and our ability to manage the data challenge relies on us enhancing our existing skills and developing new skills in data analytics (see Annex 27 – Workforce Resilience on how we will upskill our existing colleagues and attract new colleagues with the necessary skills). Fortunately, we are not starting from a zero base as our current processes for forecasting, planning and managing the distribution network have provided us with the knowledge and experience of how to process large quantities of data and manage data gaps when they appear either temporarily or for significant time periods.

Temporarily missing metered data: Although we expect the data from smart meters and LV monitoring equipment to keep flowing, this is the real world and there are likely to be times when there are temporary glitches in the equipment or the transmission channel resulting in missing data. Intermittent loss of data is easily managed using estimation algorithms or machine learning

techniques to replace the data with estimates. We currently use these techniques for missing data from our network monitoring equipment network managed through our SCADA interface into our Network Management System. These techniques are also applied to the loss of large quantities of data ie several months if there is a reasonable history of data recordings that can be assessed. In addition, we have significant experience of data processing involving estimation and machine learning techniques from the development of the ATLAS (Architecture of Tools for Load Scenarios) forecasting methodology, which have been steadily improved since its introduction into business as usual in 2018.

Limited or no metered data: At the start of RIIO-ED2 we expect that there will be elements of our network where no monitoring equipment is fitted and there are very few smart meters fitted; this presents a challenge as there will be no telemetered network visibility. Of course, over time as the smart meter rollout continues and we install more monitoring equipment network visibility will increase but, in the meantime, we need to develop the modelling capability and processes that enable us to infer the operation of those networks.

In the early years we will have numerous ground mounted and pole mounted substations that either have no data or limited data. This will be particularly the case where properties are fed from pole mounted substations. By targeting the installation of LV monitoring equipment on those substations with the highest number of customers, this means that the large majority of pole mounted substations will not have LV monitoring equipment fitted. To address this, we will create representative property models to estimate a demand and consumption profile for the properties. This enables us to generate aggregate LV feeder data in its entirety or plug gaps in the aggregated data, as we know that less than 100% of properties on that feeder have a smart meter installed. We will rely on smart meters to provide aggregated smart meter data and we will utilise the functionality of the DCC Gateway to identify the number of smart meters installed per feeder. Where there is missing smart meter data we will categorise the property type. Having identified information on the number and types of LCTs fitted and estimate a profile of demand and generation, based on similar representations to generate an assumed aggregated demand profile for that feeder.

Missing data – Low Carbon Technologies (LCT): Although it is the responsibility of the installer or property owner to notify us of the installation of a new LCT or contact us to modify our network prior to the installation of a new LCT; our experience tells us that installers or customers sometimes don't, and we may have gaps in our data knowledge. Figure 9.8 below illustrates examples of how to fill the potential knowledge gap by talking to installers, other industry parties or third-party data providers.

Figure 9.8: Potential initiatives for managing missing LCT installation data

Data type	Target groups	Opportunities
EV charger(s)	Installers	Cross checking work programme
	Retail suppliers	Identify through tariff data or profile data
	Third party data source providers eg ZapMap	Cross checking with our GIS database
Heat Pump	Installers	Cross checking work programme
	Retail suppliers	Identify through tariff data or profile data
Solar PV	Installers	Cross checking work programme
	Retail suppliers	Identify through tariff data or profile data
	Third party data providers eg Satellite images recognition software	Cross checking with our GIS database

We will also look to employ machine learning algorithms combined with smart meter data to infer if an LCT has been connected and does not feature within our data records. An example of this would be utilising the smart meters export metering to infer that a customer has embedded generation installed within their property. A targeted follow up with the customer will help to update our own records and help to gather data on installers who are not following national guidelines for LCT installation so that appropriate education and enforcement action can be initiated. Filling in these data gaps helps to ensure that we can forecast and plan more effectively as well as helping to ensure that customers installations are safe and in line with national guidelines.

In addition there other potential initiatives using existing engagement processes or customer touchpoints that provide the opportunities for engaging directly with customers. Examples are:

- As part of a PSR register follow up ask whether our information on LCTs installed at their location is up to date.
- As part of the planned interruption notices ask whether our information on LCTs installed at their location is up to date, providing contact information for the customer to get in touch.



9.3 Energy efficiency initiative

Key Information

Energy efficiency is essential to achieve Net Zero; it also saves customers money and makes homes warmer and healthier. Simply put, energy efficiency is a win-win for both our customers and Electricity North West. Energy efficiency can have a positive impact on the network, as average consumption is reduced and/or shifted away from the peak demand creating network capacity. Stakeholder feedback has already told us that it is sometimes unclear how individuals can contribute to Net Zero or they feel they can't afford to contribute. Even small inexpensive changes to the way we live our lives and utilise energy can result in wide scale reductions in energy usage across the system or help to reduce the burden on the network during peak demand periods.

We have also seen that through engaging with energy efficiency programs, this can be the catalyst to wider systemic changes to achieving Net Zero. For example, in thinking about the amount of energy somebody uses within their home this may lead to them thinking about changing their energy tariff to a time of use tariff, installing solar panels, replacing old energy intensive appliances, buying an electric vehicle, changing their diet to a less carbon intensive equivalent, engaging more with workplace energy efficiency programs, and sharing the message with others they come into contact with.

In RIIO-ED2 we will promote energy efficiency in general for all customers, using targeted customer engagement for key user groups (e.g. to alleviate fuel poverty or assist customers in vulnerable circumstances) and we will seek to deliver targeted energy efficiency programmes within defined geographic boundaries to reduce network utilisation instead of reinforcing the network. Our goal is to deliver a minimum of three energy efficiency programmes within RIIO-ED2 to release network capacity, without building network assets.

Background

Within Electricity North West, we aim to promote energy efficiency in several ways:

- We will continue to widely promote energy efficiency¹ in general, to deliver sustained energy savings for customers that goes beyond the RIIO-ED2 period,
- We will target specific groups. Further information on how we will do this can be found in other sections of our ED2 business plan:
 - Our 'Electricity users in vulnerable situations'² strategy provides information on how we will support electricity users in vulnerable circumstance to alleviate fuel poverty
 - Our Community and Local Energy strategy³ provides information on how we support these groups to help their members and communities with energy efficiency
 - We will provide advice for businesses to reduce their carbon footprint on their journey to Net Zero, in the business plan
 - Promote installation of smart meters and customers understanding their overall energy consumption and times of use is detailed here⁴
 - Provide easy to understand information on the use of the network so that customers can make rational economic decisions, is detailed here^{5,6}
- Within our DSO related operations, we will utilise energy efficiency as an alternative to network reinforcement, this is detailed below.

Energy efficiency as an alternative to network reinforcement

Several bodies associated with the delivery of the Net Zero carbon emissions target by 2050 have publicly stated that energy efficiency is essential for meeting Net Zero, including the Committee on Climate Change. Here in the North West there is still huge potential for energy efficiency measures to assist homes and businesses. Experience to date indicates that energy efficiency measures are hard to get households and businesses to adopt and can have long lead times. Feedback from our customers is they want us to encourage them to be more flexible with their electricity use rather than build more network. Our Leading the North West to Net Zero document published in 2019 aimed to address this by building on our position as a trusted intermediary. In our Transition Plan we will deliver simple energy efficiency advice, as part of wider help for our customers, as set out in the business plan. For example we will provide advice through our online Net Zero Portal, for homes and businesses by identifying the top 5 things to do for key industrial sectors and domestic customers.

1 <https://www.enwl.co.uk/go-net-zero/you-and-your-business/your-home/>

2 Please see our Annex 8 Electricity users in vulnerable situations

3 Please see our Annex 5 Community and Local Energy strategy

4 <https://www.enwl.co.uk/go-net-zero/innovation/smaller-projects/other-projects/smart-meters/>

5 <https://www.enwl.co.uk/go-net-zero/ways-to-go-net-zero/energy-efficiency-for-business/>

6 <https://www.enwl.co.uk/about-us/regulatory-information/use-of-system-charges/demand-side-management/>

Examples of simple energy saving measures, already accessible to the majority of stakeholders with a low cost to implement coupled with a good level of increase in energy efficiency

Lagging of hot water tanks, installation of sufficient levels of loft insulation, fitting of draft excluders on windows and doors, use grants to fit double/triple glazing or cavity wall insulation, enabling eco-mode on boilers and appliances which have this functionality, reducing heating temperature by 1°C (where it is safe to do so), fitting thermostatic radiator valves, and replacing light bulbs with low energy equivalents.

There is already strong evidence that demonstrates promoting energy efficiency as an alternative to network reinforcement could be made to work. We can have confidence that there is already a mature market with existing providers, which has been created by existing mechanisms such as the ECO obligation.

Through our own community and local energy initiatives we have developed relationships with local housing associations and community-based organisations that have been stimulating demand for and servicing a small (but growing) demand for whole house retrofits or zero carbon make overs. This has given us a source of evidence for how community level intermediaries could potentially act as an intermediary or aggregator.

Our engagement with stakeholders has shown us that there are various funding sources available for tackling energy efficiency, and we are starting to form relationships with funding providers to develop a holistic approach to energy efficiency. As part of our ongoing stakeholder engagement activities we have briefed the local authority partners within our region on our proposed approach to supporting energy efficiency measures instead of network reinforcement and we are planning future surgeries to identify other potential funding streams. This ensures that activities can be co-ordinated, and that funding can be combined to deliver multiple co-benefits across numerous parties.

It is important that when an area is targeted for energy efficiency measures that these are available to all. Where funding is made available there will be a need to ensure that those who will most benefit from it will be offered these opportunities first. We will utilise our stakeholder advisory panels to ensure that funding is assigned appropriately.

Some typical examples of the type of energy efficiency measures which could be considered are (not exhaustive):

- Training programs and marketing campaigns relating to how simple life changes can reduce energy usage
- Fitting of solar panels to buildings
- Improvements in building insulation
- Replacement of high energy appliances with lower energy equivalents

- Replacement or upgrading of inefficient heating systems with modern equivalents e.g. heat pumps.
- Promotion of time of use tariffs and training on how to benefit from these tariffs by moving energy usage to cheaper off-peak periods
- Storage of energy within the building during off peak periods and utilisation of this energy during peak demand periods rather than importing it from the grid. This is particularly relevant for owners of renewable generation who have excess output or those with high demand appliances e.g. Electric vehicles
- Encouraging co-location of demand and generation e.g. solar charging canopies for EV charging.

A level playing field for energy efficiency in RIIO-ED2

We recognise that delivering a programme of energy efficiency measures within a geographic area is a multi-dimensional task which takes time and effort to plan and implement. To ensure there is a level playing field for energy efficiency programmes to be considered alongside other solutions we are already in the process of amending the following processes:

Early signposting of opportunities: As the lead times to deliver energy efficiency programmes are at least a year, we have already published our forecast RIIO-ED2 requirements and will publish our detailed local network requirements at least two years in advance. Our aim is to use our network planning forecast simulations to identify the areas that have a high probability of requiring network reinforcement well ahead of need, and thus where there is opportunity for energy efficiency to release network capacity.

Engagement activities: Energy efficiency programme opportunities will be tendered in the same way as flexibility services except there will be longer stage gates for proposing and planning of an energy efficiency programme. We will offer a dialogue phase including surgeries to provide assistance to potential providers to discuss their proposals and we will consider whether to make available a small fund for potential providers to access whilst developing a compliant energy efficiency programme.

Coordination of funding: Our experience of trialling an energy efficiency programme in RIIO-ED1 is that they tend to be relatively expensive for a network operator to fund alone, but individual programmes can still stack up financially. Where we signpost potential areas for energy efficiency we will work with regional and national stakeholders, like the Local Authorities, Local Enterprise Partnerships, National Energy Action etc to identify other sources of funding that can be combined with our load related investment funding for delivering an energy efficiency programme. For example, we are aware that there are sources of funding available like the BEIS funding for energy intensive businesses. These sources of funding are ever changing so it remains important that we keep up to date with what is available, so we can offer advice to our stakeholders.

Energy efficiency programs can result in benefits from a whole energy system perspective, so we will work with other energy vectors (e.g. Gas) to promote whole energy system efficiency savings. This maximises the funding available and ensures that the solutions developed provide the optimal benefits vs costs, as well as reducing the risk of causing unintended consequences.

Evaluating energy efficiency: In 2020 the Open Networks Project devised and developed Common Evaluation Methodology and Tool within Workstream 1A. This has the functionality to evaluate energy efficiency alongside other solutions. We intend to use this tool for evaluating energy efficiency when the programme is funded solely by Electricity North West. Alternatively, we will use the more sophisticated Whole System CBA, also developed in 2020, under Workstream 4 of the Open Networks Project when there are multiple parties providing funding, and multiple parties benefiting from the programme.

Summary

We know that energy efficiency is able to deliver long term, sustained savings for our customers, as well as reducing the demand on the network. The Committee on Climate Change has recognised the importance energy efficiency can play in the journey to Net Zero and there is huge potential for energy efficiency from homes and businesses across the North West. Our project, [Power Saver Challenge](#), showed that we could deliver an energy efficiency programme to release network capacity, albeit relatively expensively. It also showed there is an existing market that we can access for delivering energy efficiency for fulfilling our DSO obligation and new licence condition. To ensure there is a level playing field for energy efficiency we are proposing to adapt the signposting and evaluation processes and introduce a new engagement and coordination process. Our goal is to deliver three energy efficiency programmes with RII0-ED2, instead of developing new assets. We expect to see our drive for energy efficiency to have a positive effect on the take up of low carbon technologies, as customers start to engage with the low carbon and Net Zero agenda.



9.4 High Level Transition Plan

Key Information

This section contains the delivery milestones and timings of the baseline expectations in the DSO Transition Plan, shown per role.

Area		Activity	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	
Planning and network development	Forecasting	Enhance EHV forecasting techniques (i.e. ATLAS)	Development	Implementation into business as usual	Continuous improvement/optimising	Continuous improvement/optimising	Continuous improvement/optimising	Continuous improvement/optimising	Continuous improvement/optimising	Continuous improvement/optimising	Continuous improvement/optimising	Continuous improvement/optimising	Continuous improvement/optimising	Continuous improvement/optimising	
		Develop and embed new HV/LV forecasting techniques					Development	Development	Development	Development	Implementation into business as usual				
		Install LV network monitoring equipment (Pre-sense)					Implementation into business as usual	Implementation into business as usual	Implementation into business as usual	Implementation into business as usual					
	Modelling/planning	Create heatmaps for the HV and LV networks								Implementation into business as usual					
		Begin enhanced modelling the HV & LV networks to forecast the future requirements for interventions utilising new network monitoring data								Implementation into business as usual					
		Signal the potential need for energy efficiency measures to be employed								Implementation into business as usual					
		Generate reactive power (MVar) forecasts for the HV network						Implementation into business as usual							
		Assess the requirements for the use of flexible services within the HV & LV networks								Implementation into business as usual					
	Data	Provide a data repository, on the website, allowing access to the data in machine readable formats (e.g. APIs)								Implementation into business as usual					
		Provide a data repository, on the website, allowing access to data in the format of human readable visualisations.						Development	Development	Development	Implementation into business as usual				
		Develop the processes required to deliver an annual digitalisation strategy refresh, and update the action plan bi-annually						Implementation into business as usual							
	Network planning	Upgrade or replace the existing network planning tool to facilitate enhanced DSO forecasting and data exchange processes (i.e with CIM capabilities)						Development	Development	Development	Implementation into business as usual				
		Develop the processes required to produce and publish DFES EHV forecasts annually	Development	Implementation into business as usual											
		Develop the processes required to produce and publish DFES HV forecasts annually							Development	Implementation into business as usual					
		Develop the processes required to produce and publish DFES LV forecasts annually							Development	Implementation into business as usual					
		Develop the processes required to refresh the network planning document (NPD) annually						Development	Implementation into business as usual						
	Identify solution options	Publish a methodology statement for the identification of solution options						Implementation into business as usual							
		Develop and integrate the processes required to identify energy efficiency programmes to defer/avoid conventional network reinforcement								Implementation into business as usual					
	Flexibility	Increase opportunities for flexibility by incorporating LV monitoring data into network modelling to build a more granular picture of the LV and HV networks.							Implementation into business as usual						
		Remove materiality threshold for flexible services procurement								Implementation into business as usual					
Evaluation of options	Enhance the ROCBA tool to include: micro scenarios, full carbon impact assessment, asset management interventions alongside reinforcement needs, quantification or qualitative assessment of whole system outcome.								Continuous improvement/optimising	Continuous improvement/optimising					
	Further enhance the Common Evaluation Methodology (CEM) tool							Continuous improvement/optimising	Continuous improvement/optimising						
Transparency in decision-making	Introduce a standstill period within the decision making process for selection of options, to promote stakeholder challenge of the preferred solution choice.								Implementation into business as usual						
	Introduce a decisions review process to incorporate the DSO stakeholder panels input.								Implementation into business as usual						

■ Development
 ■ Implementation into business as usual
 ■ Continuous improvement/optimising

		2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Network operation	MOM	Introduce the Merit Order Management system (MOM)				■	■	■	■				
		Develop the processes required to share the merit order list/stack with other stakeholder groups					■	■					
		Introduce the trading of curtailment liability					■	■	■	■			
		Review if MOM system should be managed by a third party organisation									■		
	Data	Develop the processes required to extract data from the corporate IT systems and convert this into a CIM format					■	■	■				
		Develop ICCP links between our control room and those of other adjacent licensees (DNOs, IDNOs, ESO, TO)						■	■	■			
	Curtailment index	Implement the processes to regularly publish the actual curtailment values for individual customers		■									
		Develop the processes required to give access to network users to view curtailment stacks in near real time						■					
	ANM	Implement Active Network Management (ANM) into business as usual				■	■	■	■	■			
		Publish the methodology for generation of curtailment stacks					■	■					
		Publish ANM zones and potential constraint info						■					
		Develop flexible services dispatch utilising an API					■						
	Curtailment liability trading	Procure a platform-based marketplace					■	■	■	■	■	■	■
		Facilitate a process to allow network users behind a constraint to opt-into participating in flexibility trading						■					
		Develop the processes required to carry out the data exchange of curtailment information via ICCP to other system and network licensees								■	■		
	Flexibility services	Integrate the Flexible Power platform into business as usual				■	■						
		Transition to the short term forecasting for the procurement and dispatch flexible services								■	■		
		Develop the processes required to procure flexible services close to real time								■	■		
	Facilitating secondary trading	Define and publish market parameters within which parties can trade							■	■			
	Industry standardisation	Engagement and coordination with other system and network licensees	■	■	■	■	■	■	■	■	■	■	■
Continuous improvement through stakeholder engagement	Begin to publish an annual report on our progress towards DSO transition targeted at our stakeholders; show how we are delivering against our commitments						■						
	Engage with stakeholders to ensure that our DSO transition is focused on their needs.	■	■	■	■	■	■	■	■	■	■	■	

		2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Market development	Standardisation	Work with other system and network licensees to standardise flexible services products and agreements		■	■	■	■	■	■	■	■	■	■
		Adopt agreed products, processes, and methodologies into business as usual				■							
		Enhance and adopt standardised flexible services contracts into business as usual				■	■	■					
	Open governance	Embed flexible services products and contracts into electricity network codes				■	■	■					
	Flexibility products	Procure short term flexibility for both planned and unplanned outages						■	■				
		Procure flexibility for connections driven reinforcement						■	■				
	Flexibility services	Develop the processes required to sign post future flexibility needs with the use of heat maps					■	■					
		Remove materiality threshold for flexible services procurement							■				
		Adopt the bi-annual flexibility requirements publication			■	■	■						
		Introduce a pseudo DAG process for sign off of procured solutions					■	■	■				
		Develop the processes required to publish DFS procurement statement annually					■	■	■				
		Adopt dynamic procurement				■							
		Develop the processes required to publish DFS procurement report annually						■					
	Marketplace platforms	Begin to procure the provision of a marketplace platform				■							
		Seek to implement a fixed fee payment structure for marketplace platform utilisation cost.						■					
		Begin to utilise platforms pre-qualification and credit checking services				■							
		Align procurement protocols and arrangements with those utilised by the ESO					■						
	Flexibility service evaluation	Begin to utilise the CEM tool to specify optimum contract length					■						
		Publish a methodology for defining short or long-term contracts					■						
		Enhance the ROCBA tool to include: micro scenarios, full carbon impact assessment, asset management interventions alongside reinforcement needs, quantification or qualitative assessment of whole system outcome					■						
		Begin to publish tender outcomes			■								
	Flexible connections	Develop and adopt standard products with those used by other licensees		■	■	■	■						
	Flexible power	Integrate the tools to dispatch flexible services using standard APIs					■						
		Integrate the tools to settle flexible services contract utilisation following industry best practise					■						
	Secondary trading	Develop/integrate a secure marketplace platform for secondary trading						■	■	■	■	■	■
		Utilise the platform functionality to facilitate secondary trading										■	
	Stakeholder engagement	Establish a DSO stakeholder panel						■					
		Empower panel to guide data best practise						■					
Empower panel to review decisions							■						
Empower panel to review methodologies							■						
Managing conflict of interests	Employ DSO compliance officer						■						
	Start to produce and publish a compliance report annually							■					

9.5 Baseline Expectation Mapping

Key Information

This section maps the actions contained within the DSO Transition Plan that deliver the baseline expectations.

Baseline Expectation description	Document ref	Business plan actions
<p>1.1.1 DNOs to define and develop enhanced forecasting, simulation and network modelling capabilities, with processes in place to drive continual improvement to meet network and user needs.</p> <ul style="list-style-type: none"> We expect increased monitoring equipment to be rolled out across their network where it has demonstrable net value. We expect demonstrable value to include a rigorous presentation and analysis of needs and use of data for networks and non-networks parties, well established functional and technical specifications, and cost-effectiveness analysis. DNOs should also explore all reasonable options to use data from third parties, including harnessing smart meter data subject to data sharing agreements, to improve their simulated forecasting. 	<p>Section 5.1: Forecasting</p>	<ul style="list-style-type: none"> Development of ATLAS methodology to forecast kW & kVAR at all network voltages by 2023. Integration of smart metering and PreSense data and data from other sources eg IDNOs into ATLAS models by 2025. ED1: Installation of 3,531 LV monitors at the most populous ground-mounted substations by end of RIIO-ED1. ED2: Installation of [REDACTED] LV monitors at distribution substations, and [REDACTED] additional monitors on HV circuits by end of RIIO-ED2. Create LV heatmaps by 2025 and enhanced HV heatmaps by end of RIIO-ED1. Model LV and HV networks using ATLAS forecasts and signal the potential need for energy efficiency and/or flexibility from local communities from 2023.
	<p>Section 5.1: Data and data-sharing</p>	<ul style="list-style-type: none"> Progressively collect and share regularly the following datasets as defined in the ENA data catalogue; start sharing in 2023. Share reactive power (kVAR) forecasts with the ESO, by the end of RIIO-ED1.
	<p>Section 5.1: Increasing solution options</p>	<ul style="list-style-type: none"> Ensure the widest range of solution options for evaluation, through signposting and engagement with providers, and adopt the most efficient whole life cost solution; initially in 2023, enhancing throughout RIIO-ED2.
	<p>Section 5.1: Assessing options</p>	<ul style="list-style-type: none"> Utilisation of the CEM tool and/or ROCBA, where it facilitates the comparison of additional parameters or provides greater granularity, started in 2021 with new functionality added in RIIO-ED2.
<p>1.1.2 We expect DNOs to submit a network visibility strategy and this should cover the use of all sources of network data including direct measurement from monitoring roll-out, smart meter data, data analysis and modelling, and any other third party data sources. The strategy should explain how network monitoring for planning purposes will inform planning decisions, including the use of flexibility; clear justifications for where and when monitoring is rolled-out, including explanations of any targeting for equipment deployment; and the specifications of equipment, including detail on the data captured, frequency of polling, and the mode of communicating data. Note, companies may wish to combine this strategy with network monitoring and visibility for network operations under role 2.</p>	<p>Network Visibility Strategy - Annex 4 and</p> <p>Section 9.2: Network Monitoring Initiative</p>	<ul style="list-style-type: none"> Our network visibility strategy is to deliver 100% network coverage by the end of ED2, using a mix of aggregated smart meter data, third party data and data from the target deployment of LV and HV network monitoring. This data will be used to develop LV heatmaps by 2025 and enhance HV heatmaps by end of RIIO-ED1 showing available capacity and constraints. This data will be used in forecasting to develop granular forecasts, and when used in network simulations can provide forecast constraint data which will be used in our flexibility needs signposting and tendering processes starting 2023.

Baseline Expectation description	Document ref	Business plan actions
<p>1.1.3 DNOs to have in place standard and effective processes for sharing network planning information with other network licensees, including the ESO, network users and other interested parties, for example to enable innovation and support the development of local government plans for decarbonisation.</p> <ul style="list-style-type: none"> • As part of this, we expect DNOs to liaise with their network users to collate and share data, to publish comprehensive and comparable heat maps that provide network users high value information about where to connect, and to inform their operations. • These geographic information system datasets should be available for download or for access independently of DNO websites (for example, via Web Map Service server connections). Ofgem-led reforms to the LTDS will seek to licence minimum standards against these improvements. 	<p>Section 5.1: Data and data-sharing</p>	<ul style="list-style-type: none"> • Provide data in a range of formats, accessible to different stakeholder requirements: e.g APIs, CSV, MS Excel, visualisations, interoperable data formats section; starting in 2023 and enhancing throughout RIIO-ED2. • Produce heatmaps for all network voltage levels by 2025. • Align data and data-sharing approach to Energy Data Task Force as we adopt a presumed open approach, unless confidential or commercially sensitive by 2024. • Implement modification proposals in Grid Code, Distribution Code and DCUSA for standardised data sharing between multiple licensees or between licensees and stakeholders as defined by modification process. • Progressively collect and share regularly the following datasets as defined in the ENA data catalogue, with each decision being guided by the DSO Stakeholder Panel, starting 2023. • Establish an ICCP (Inter-control Centre Communications Protocol) link with the ESO to facilitate bilateral exchange of real-time data, as agreed by ESO.
	<p>Section 5.1: Network planning</p>	<ul style="list-style-type: none"> • Upgrade network planning tools to share network model(s) with electrical characteristics and parameters, via IEC Common Information Model (CIM) protocol, to network/system licensees through their chosen medium by 2024.

Baseline Expectation description	Document ref	Business plan actions
<p>1.1.4 DNOs to have in place transparent and robust processes for identifying and assessing options to resolve network needs, using competition where efficient.</p> <ul style="list-style-type: none"> • This should include demonstrable cross-sector engagement, optioneering, and planning with sectors or vectors other than their own. • DNOs should consider flexibility and promoting energy efficiency in addition to innovative use of existing network assets and traditional reinforcement. The process of identifying options should include engaging with other network licence holders and current and prospective network users. Options must be fairly compared against one another, with flexibility used where it is economic and efficient compared to investing in traditional reinforcement or technological solutions. We expect a consistent approach for valuing flexibility, taking into account the option value it provides in the context of uncertainty. DNOs must ensure transparency in their approach to allow scrutiny of decision-making. 	<p>Section 5.1: Network planning</p>	<ul style="list-style-type: none"> • Publish planning methodology statement that explains the end-to-end process from forecast to decision-making to provide clarity and transparency on how our networks are planned in 2023. • This planning methodology statement defines the analysis methodology and process in compliance with the licence obligation and national standard, EREC P2.
	<p>Section 4.5: Delivering Whole System outcomes</p>	<ul style="list-style-type: none"> • Refresh Decarbonisation Pathways report for each region every two years, starting 2021. • Support the Local Authorities deliver their Local Area Energy Plans, starting 2021 with increased capability from 2023. • Work with and support the regional and local transport agencies to connect EV charging infrastructure, starting 2021 with increased capability from 2023. <p>Work with and support the LAs, county councils and combined authority to plan for and connect heat pumps, starting 2021 with increased capability from 2023.</p>
	<p>Section 5.1: Identifying network needs</p>	<ul style="list-style-type: none"> • Publish a methodology statement describing the processes we follow for identifying network needs in 2023. • Publish annual DFES forecasts and update heatmaps at all voltage levels quarterly from 2025. <p>Signpost regularly information on where there is either a potential network constraint or available capacity from 2023.</p>
	<p>Section 5.1: Increasing solution options</p>	<ul style="list-style-type: none"> • Positively engaging with as many solution providers as possible in all our decisions is key to our strategy of delivering efficiencies for customers. We will engage the help of others to find new solutions to our network issues, thus ensuring that we have the widest range of options possible for evaluation and adopt the most suitable economic approaches, started in 2020 and with increased capability from 2023. • Publish information on all current and forecast network constraints to encourage potential solutions from flexibility providers, customers, ESO, TOs, other DSOs and IDNOs, and local or community energy groups, starting 2021 with increased capability from 2023. <p>Working with other energy vectors and local authorities will be a key part of developing and embedding whole system outcomes through the planning process, started in 2020 and with increased capability from 2023.</p>
	<p>Section 4.4: Flexibility First</p>	<ul style="list-style-type: none"> • Adopt a 'flexibility first' approach seeking flexibility services for every network reinforcement project, except those constraints that cannot be resolved by flexibility started in 2020.
	<p>Section 5.1: Assessing options</p>	<ul style="list-style-type: none"> • Utilisation of the CEM tool and/or ROCBA, where it facilitates the comparison of additional parameters or provides greater granularity, started in 2021 with new functionality added in RIIO-ED2. • Evaluation tools enhanced in 2023 to take into consideration option value, when the future demand on the network is uncertain.
	<p>Section 5.1: Stakeholder involvement</p>	<ul style="list-style-type: none"> • DSO Stakeholder Panel to provide guidance on what data, including third-party data, we use in our forecasting and simulation modelling and what data we share, starting in 2023. • Publish all evaluation models alongside our decisions for information, review or challenge, started in 2021 and enhance throughout RIIO-ED2 guided by feedback. • Introduce in 2023 two additional checks for our customers and stakeholders to challenge our proposed decisions: <ul style="list-style-type: none"> • A 10 day standstill period after publication of decisions for scrutiny and challenge of our proposed decision, and <ul style="list-style-type: none"> • A decisions review process to ensure that any decisions that are challenged are independently reviewed by our DSO Stakeholder Panel. • These transparent processes and the oversight by the DSO stakeholder panel provide the opportunity for any party to scrutinise our decisions and/or methodologies.

Baseline Expectation description	Document ref	Business plan actions
<p>2.1.1 DNOs to improve network visibility and identification and sharing of operability constraints, including publishing this data to help avoid conflicting actions being taken by other network and system operators. DNOs must take reasonable steps to access and subsequently share, including by publishing, data and operability constraint information in a timely manner.</p>	<p>Section 5.2: Visibility of network utilisation</p>	<ul style="list-style-type: none"> • Produce heatmaps at all network voltages by 2025.
	<p>Section 5.2: Active network management</p>	<ul style="list-style-type: none"> • Publish a methodology statement describing how the ANM system executes the merit order, dictated by the merit order management (MOM) system in 2023. • Review this statement annually with stakeholders and updated as required, starting in 2023.
	<p>Section 5.2: Flexible connections and curtailment index</p>	<ul style="list-style-type: none"> • Publish a curtailment index per voltage level which is presented as the percentage of time that the network is unavailable, started in 2020. <p>Issue an annual review letter of providing the curtailment experienced over the previous year, started in 2020 and enhance throughout RIIO-ED2 guided by feedback.</p>
	<p>Section 5.2: Sharing network data</p>	<ul style="list-style-type: none"> • Share network topology, configuration information, and loading information in a standard interoperable format based on the CIM from 2023. • Develop capability in RIIO-ED1 to extract network data from our core IT systems and convert it to CIM format for use internally and sharing externally. • Develop the CIM standard, with other DNOs, into a standard suitable for all distribution networks, including the low voltage level and make datasets available, starting in 2023. • Share short term capacity headroom at boundaries to adjacent DNO or embedded IDNO networks to promote efficient use of network and decision making and seek reciprocal information, starting in 2023.
	<p>Section 5.2: Sharing curtailment information</p>	<ul style="list-style-type: none"> • Publish the merit orders by which our ANM system will dispatch flexible resources for each constraint from 2023.
	<p>Section 5.2: Sharing a user's curtailment information</p>	<ul style="list-style-type: none"> • With input from network users develop an information sharing screen and made available to each DER owner connected to the ANM system by 2023. • Allow each DER site will be able to access this data via a password protected interface which will show only data which is relevant to their site from 2023.
	<p>Section 5.2: Sharing a user's curtailment information</p>	<ul style="list-style-type: none"> • Publish the individual merit order lists for each ANM zone from 2023.
	<p>Section 5.2: Facilitating curtailment trading</p>	<ul style="list-style-type: none"> • Share merit order information with each flexible connectee is to help them identify their curtailment risk in advance, so that they can evaluate the impact on other contractual obligations from 2023.
	<p>Section 5.2: Managing curtailment and distribution flexibility services together</p>	<ul style="list-style-type: none"> • Share information with each network user behind a constraint to allow them to see their position in the stack relative to other network users from 2023.

Baseline Expectation description	Document ref	Business plan actions
<p>2.1.2 We expect DNOs to submit a network visibility strategy and this should cover the use of all sources of network data including direct measurement from monitoring roll-out, smart meter data, data analysis and modelling, and any other third party data sources. The strategy should explain how network monitoring for operational purposes will inform operational decisions, including enabling the management and delivery of flexibility services; clear justifications for where and when monitoring is rolled-out, including explanations of any targeting for equipment deployment; and the specifications of equipment, including detail on the data captured, frequency of polling, and the mode of communicating data. Note, companies may wish to combine this strategy with network monitoring and visibility for network planning under role 1.</p>	<p>Section 3: Our vision to address our customers' needs</p>	<ul style="list-style-type: none"> • Further enhance our world leading forecasting and evaluation tools and produce granular forecast and heatmaps for all voltage levels from smart meter data and LV and HV monitoring equipment by 2025.
	<p>Section 5.1: Forecasting</p>	<ul style="list-style-type: none"> • Incorporate data from other sources into forecasting and modelling tools, for example IDNOs by 2024.
	<p>Section 9.2: Network monitoring initiative</p>	<ul style="list-style-type: none"> • Install LV monitoring on 13,250 of the most populous ground mounted substations, with LV monitoring covering 95% of our connected customers by the end of RIIO-ED2. • Install HV monitoring on 600 circuits with these being predominantly focused on the overhead network, where the network loading is uncertain and highly variable by the end of RIIO-ED2. • Use aggregated smart meter data to monitor the loading on the network as well as disaggregated off supply notifications, and voltage data to monitor the networks real time condition, started in 2021 and enhanced throughout RIIO-ED1 & ED2. • Will further enhance our world leading forecasting and evaluation tools and produce granular forecast and heatmaps for all voltage levels from smart meter data supplemented with the granular data created by the installation of new LV and HV monitoring equipment in ED2 by 2025.
	<p>Network Visibility Strategy - Annex 4</p>	<ul style="list-style-type: none"> • The network visibility strategy is to deliver 100% network coverage by the end of ED2, using a mix of aggregated smart meter data, third party data and data from the target deployment of LV and HV network monitoring. • The data will be used to develop LV heatmaps by 2025 and enhance HV heatmaps by the end of RIIO-ED2 showing available capacity and constraints, informing operational decisions on use of flexibility services.
<p>2.1.3 DNOs to provide the ESO with information across timescales about the DER it is planning to instruct to dispatch. Data should include contracted parties, availability and information on scheduled and unscheduled utilisation. Sharing this information in a timely manner should enable the ESO to identify which DER are available for its own needs and improve the ability of DER to stack value across markets.</p>	<p>Section 5.2: Sharing network data</p>	<ul style="list-style-type: none"> • Share network topology, configuration information, and loading information in a standard interoperable format based on the CIM in 2023. • Develop our capability in ED1 to extract network data from our core IT systems and convert it to CIM format for use internally and sharing externally. • Develop the CIM standard with the other DNOs, into a standard suitable for distribution networks, including low voltage and make these datasets available, starting in 2023. • Share short term capacity headroom at boundaries to adjacent/embedded network operators to promote efficient network use and seek reciprocal information starting in 2023.
	<p>Section 5.2: Sharing curtailment information</p>	<ul style="list-style-type: none"> • Publish the merit orders by which our ANM system will dispatch flexible resources for each constraint from 2023.
	<p>Section 5.2: Publishing constraint information</p>	<ul style="list-style-type: none"> • Publish the individual merit order lists for each ANM zone from 2023.
	<p>Section 5.2: Managing curtailment and distribution flexibility services together</p>	<ul style="list-style-type: none"> • Provide a merit order list to all network users and other system or network licensees, this enables coordinated actions to be managed and facilitates secondary trading from 2025. • Utilise data transfer links, e.g. ICCP links, to share near real-time operational data between control rooms and their supporting systems with timelines agreed with each party.

Baseline Expectation description	Document ref	Business plan actions
<p>2.1.4 DNOs to gather sufficient information on DER characteristics and parameters to provide information and inform decisions to secure against events that could lead to disconnection of DER.</p>	<p>Section 5.2: DER information and unavailability</p>	<ul style="list-style-type: none"> • Require all flexible services providers to signal unavailability for any services they are contracted to provide, started in 2020. • Determine the impact of a flexible service failure and utilise the ROCBA model/CEM tool to choose how much we choose to procure to manage the risk, started in RIIO-ED1 and enhanced throughout RIIO-ED2.
<p>2.1.5 DNOs to make available operational data that supports network users and other relevant stakeholders to make better decisions about how to use the network. Data should be readily available in agreed and common data formats. This could include, but is not limited to:</p> <ul style="list-style-type: none"> • Working network configuration data • losses recorded at substation level • outages both planned and unplanned • as recorded historic Feeder MW/MVA Utilisation and calculated headroom/footroom • utilisation and curtailment of areas under the control of capacity management systems such as Active Network Management systems. 	<p>Section 5.2: Managing curtailment and distribution flexibility services together</p>	<ul style="list-style-type: none"> • Utilise data transfer links, e.g. ICCP links, to share near real-time operational data between control rooms and their supporting systems with timelines agreed with each party.
	<p>Section 5.2: Sharing network data</p>	<ul style="list-style-type: none"> • Share network topology, configuration information, and loading information in a standard interoperable format based on the CIM from 2023. • Develop the CIM standard with the other DNOs, into a standard suitable for distribution networks, including low voltage and make these datasets available, starting in 2023. • Share operational data with the ESO and other licensees as agreed with each party.
	<p>Section 5.2: Data and data-sharing</p>	<ul style="list-style-type: none"> • Provide a data portal, accessible via our website that enables customers, stakeholders and other interested third parties access to download our published data, or where practical visualise it, using a visualisation tool for greater insights starting in 2022 and enhanced throughout RIIO-ED2. • Offer APIs to allow data-sharing services/platforms to retrieve and host Electricity North West published data, starting in 2023 and enhanced throughout RIIO-ED2. • Continue support for the development of the Flexr data-sharing service, created by ElectraLink. • Continue support of modification proposals in Grid Code, Distribution Code and DCUSA for data sharing between multiple licensees or between licensees and stakeholders with implementation as defined by modification process. • Establish an ICCP (Inter-control Centre Communications Protocol) link with the ESO to facilitate bilateral exchange of real-time data. • Communicate with the ESO the operating state of our ANM system, along with real-time limitations and flexibility dispatch criteria from our MOM system as agreed with ESO. • Utilise information received from the ESO through the data sharing channels as inputs to our network management and ANM systems, in timescales agreed with ESO. • Share reactive power forecasts with the ESO to facilitate them making informed investment and control decisions, started in 2020 and enhanced throughout RIIO-ED2. • Triage data and share in CIM formats utilising dedicated communications links, in timescales agreed with ESO.

Baseline Expectation description	Document ref	Business plan actions
<p>2.2.1 DNOs to have and regularly review a decision-making framework for when DER are instructed to dispatch in real-time. The decision-making process, including alternatives considered, should be transparent. This should promote coordination across services (including curtailment as part of non-firm connection agreements and ESO flexibility services), maximise liquidity, avoid market fragmentation and ensure dispatch results in the best outcome for the whole system; this includes service provision to the ESO and other distribution networks. As part of this decision-making framework, there must be rules in place for coordinating dispatch instructions for DSO and ESO flexibility services. This could be through primacy rules or more comprehensive optimisation processes that better enable stacking of revenues for DER. The rules should be transparent, objective, and promote whole system efficiencies.</p>	<p>Section 5.2: Transparent decision-making</p>	<ul style="list-style-type: none"> • Create curtailment lists/stacks and merit order lists, where network users are stacked in order of likely curtailment i.e. those at the top of the stack face greater probability of curtailment in 2023. • For each potential constraint identified within an ANM zone, the MOM system will create a stack in 2023. • Reprioritise the merit order list following an event where a DER is curtailed, to ensure the correct DER asset is selected for any subsequent event, starting in 2023.
	<p>Section 5.2: Merit order management</p>	<ul style="list-style-type: none"> • Combine flexible services and flexible connections into a single merit order list and rank them in the best order, to allow for the unbiased deployment of flexibility solutions in 2023. • Utilise stakeholder feedback to define the pseudo price of curtailment, to rank curtailment fairly against procured flexible services in 2023.
	<p>Section 5.2: Sharing a user's curtailment information</p>	<ul style="list-style-type: none"> • With input from network users, an information-sharing screen will be developed and made available to each DER owner connected to the ANM system in 2023. <ul style="list-style-type: none"> o Each DER site will be able to access this data via a password protected interface which will show only data which is relevant to their site. o This facility will graphically represent a view of the likelihood of the site being constrained and by what magnitude during the upcoming period. o The data presented is based upon historical data of network demands, predicted generation outputs, weather data, site position in the merit order stack, existing flexible services contracts and known planned network switching events.
	<p>Section 5.2: Managing curtailment and distribution flexibility services together</p>	<ul style="list-style-type: none"> • Develop the ANM system to utilise all resources which are available to it to resolve network constraints in the sequential order of the merit order list, starting in 2023 with enhancements planned by 2026.
	<p>Section 5.2: Facilitating trading of distribution flexibility services</p>	<ul style="list-style-type: none"> • Extend the provision of merit order and constraint information to all network users to facilitate the trading of curtailment risk and other Distribution Flexibility Services in 2025. • Providing a merit order list to all network users and other system or network licensees to enable coordinated actions to be managed and facilitate secondary trading in 2025. • Regularly review our approach and provision of information; utilising the DSO Stakeholder Panel to assist with defining the data shared with stakeholder groups.

Baseline Expectation description	Document ref	Business plan actions
<p>2.2.2 DNOs shall facilitate secondary trading of distribution flexibility services and curtailment obligations. In this context, facilitating means providing the relevant operational data, ensuring the DNO has processes in place to collect the relevant data about the trade, and making the operational parameters clear (and justified in the context of network reliability and efficiency).</p>	<p><u>Section 5.2:</u> Sharing a user's curtailment information</p>	<ul style="list-style-type: none"> • With input from network users, an information-sharing screen will be developed and made available to each DER owner connected to the ANM system in 2023. <ul style="list-style-type: none"> o Each DER site will be able to access this data via a password protected interface which will show only data which is relevant to their site. o This facility will graphically represent a view of the likelihood of the site being constrained and by what magnitude during the upcoming period. o The data presented is based upon historical data of network demands, predicted generation outputs, weather data, site position in the merit order stack, existing flexible services contracts and known planned network switching events.
	<p><u>Section 5.2:</u> Facilitating trading of distribution flexibility services</p>	<ul style="list-style-type: none"> • Extend the provision of merit order and constraint information to all network users to facilitate the trading of curtailment risk and other Distribution Flexibility Services in 2025. • Providing a merit order list to all network users and other system or network licensees to enable coordinated actions to be managed and facilitate secondary trading in 2025. • Regularly review our approach and provision of information; utilising the DSO Stakeholder Panel to assist with defining the data shared with stakeholder groups.
	<p><u>Section 5.2:</u> Facilitating curtailment trading</p>	<ul style="list-style-type: none"> • Facilitate connected parties to trade away their curtailment liability with others in the stack or trade to accept additional curtailment risk in return for financial reward starting in 2023. • Move to a platform-based marketplace to facilitate direct bilateral trading of curtailment risk when functionality is available, but by 2025. • Offer to share the merit order information with all network users behind each constraint via an opt-in process to increase the volume of potential trading parties in 2023. • Combine curtailment trading with our flexibility services marketplace requirements and tender at the same time starting in 2023. • Provide access to real-time data, on request, via ICCP, where appropriate, with a sufficient level of granularity to allow the user to cross-reference against their own procured services, offering in 2023 but implementation timescales agreed with each party. • Sharing data to a level of granularity so that other relevant licensees can satisfy themselves that co-ordinated conflict management or primacy rules are not necessary, and distributed energy resources will be able to stack revenues for their flexibility services, offering in 2023 but implementation timescales agreed with each party.

Baseline Expectation description	Document ref	Business plan actions
<p>2.2.3 DNOs to introduce clear processes for the design, development, and communication of the decision-making framework. These should include transparent and participatory processes for stakeholder input.</p>	<p>Section 5.2: Transparent decision-making</p>	<ul style="list-style-type: none"> • Create curtailment lists/stacks and merit order lists, where network users are stacked in order of likely curtailment in 2023. • For each potential constraint identified within an ANM zone, the MOM system will create a stack in 2023. • Reprioritise the merit order list following an event where a DER is curtailed, to ensure the correct DER asset is selected for the subsequent event starting in 2023.
	<p>Section 5.2: Merit order management</p>	<ul style="list-style-type: none"> • Combine flexible services and flexible connections into a single merit order list and rank them in the best order, to allow for the unbiased deployment of flexibility solutions in 2023. • Utilise stakeholder feedback to define the pseudo price of curtailment, to rank curtailment fairly against procured flexible services in 2023.
	<p>Section 5.2: Sharing a user's curtailment information</p>	<ul style="list-style-type: none"> • With input from network users, an information-sharing screen will be developed and made available to each DER owner connected to the ANM system in 2023. <ul style="list-style-type: none"> o Each DER site will be able to access this data via a password protected interface which will show only data which is relevant to their site. o This facility will graphically represent a view of the likelihood of the site being constrained and by what magnitude during the upcoming period. o The data presented is based upon historical data of network demands, predicted generation outputs, weather data, site position in the merit order stack, existing flexible services contracts and known planned network switching events.
	<p>Section 5.2: Managing curtailment and distribution flexibility services together</p>	<ul style="list-style-type: none"> • Develop the ANM system to utilise all resources which are available to it to resolve network constraints in the sequential order of the merit order list in 2023.
	<p>Section 5.2: Facilitating trading of distribution flexibility services</p>	<ul style="list-style-type: none"> • Extend the provision of merit order and constraint information to all network users to facilitate the trading of curtailment risk and other Distribution Flexibility Services in 2025. • Providing a merit order list to all network users and other system or network licensees to enable coordinated actions to be managed and facilitate secondary trading in 2025. • Regularly review our approach and provision of information; utilising the DSO Stakeholder Panel to assist with defining the data shared with stakeholder groups.
	<p>Section 4.1: Stakeholder involvement in DSO transition</p>	<ul style="list-style-type: none"> • Form the DSO Stakeholder Panel include: to provide confidence to stakeholders and customers that we have published robust decision-making processes and that we are following them in 2023.

Baseline Expectation description	Document ref	Business plan actions
<p>2.2.4 DNOs to develop efficient, scalable dispatch instruction infrastructure and avoid proprietary systems. We expect clear definitions of different types of dispatch instruction for distribution flexibility services and transparent rules about when and in which markets they should be used. Circumstances for different dispatch instructions should be well-justified. Definitions of these circumstances should be developed with input and cooperation from network users. The application of hard dispatch controls shall be for the improved reliance on market-based mechanisms, not to the detriment of their development. Capabilities in network operations, for example in dispatch instructions and associated system architectures shall not be hard coded to the DNO. These must be developed so that they can be cost effectively assigned to another party in future if this is needed.</p>	<p>Section 5.2: Dispatch</p>	<ul style="list-style-type: none"> • Facilitate the dispatch of flexible services using APIs starting in 2022. • Offer the option of flexible services being dispatched via a company owned RTU, where the customer would prefer this option, started in 2020.
<p>3.1.1 DNOs collate and publish as much relevant data and information as reasonable that will help market participants identify and value opportunities to provide network services to DNOs and take market actions that support efficient whole system outcomes. Relevant data and information include planning and operational data (such as that set out in Activity 1.1 and 2.1). This should be provided with sufficient lead times to enable wider participation in distribution flexibility services markets. It also includes information on historic and future distribution flexibility services market actions. This should include tender results, prices bid and paid, the carbon content of aggregated units, how often DER is dispatched (and volumes) and other actions taken by the DNO (with anonymisation as required), including curtailment as part of non-firm connection agreements. The information should include all requirements set out in licence conditions to support DER to identify revenue opportunities. This increases the accessibility of tendering for distribution flexibility services for flexibility providers (while also taking account of DNOs flexibility needs).</p>	<p>Section 5.3: Dispatch, baselining and settlement</p>	<ul style="list-style-type: none"> • Dispatch is aligned with the standard protocols i.e. we will utilise the standard API interface to engage with flex providers for dispatch and settlement purposes in 2023.
<p>3.1.2 DNOs should, with stakeholder input, develop robust strategies for how they will collate and publish more helpful information, wherever possible consistently and in coordination with other network licence holders, and communicate this clearly.</p>	<p>Section 5.3: Comprehensive market information</p>	<ul style="list-style-type: none"> • Develop and consult on a stakeholder engagement strategy and plan for distribution flexibility services and the sharing of market information in 2023. • Implement multiple communication methods for stakeholder engagement, starting in 2022 and enhance throughout RIIO-ED2 guided by feedback. • Publish key market information starting in 2022.
<p>3.1.2 DNOs should, with stakeholder input, develop robust strategies for how they will collate and publish more helpful information, wherever possible consistently and in coordination with other network licence holders, and communicate this clearly.</p>	<p>Section 5.3: Reporting requirements and publicising tender outcomes</p>	<ul style="list-style-type: none"> • Comply with SLC 31E requirements and publish the results of any tender outcomes started in 2021.
<p>3.1.2 DNOs should, with stakeholder input, develop robust strategies for how they will collate and publish more helpful information, wherever possible consistently and in coordination with other network licence holders, and communicate this clearly.</p>	<p>Section 5.3: Comprehensive market information</p>	<ul style="list-style-type: none"> • Develop and consult on a stakeholder engagement strategy, plan for distribution flexibility services and energy efficiency and the sharing of market information in 2023. • Publish information to maximise the opportunities to provide flexibility services to Electricity North West and to any other party, started in 2021 and enhance in RIIO-ED2.

Baseline Expectation description	Document ref	Business plan actions
<p>3.1.3 DNOs should regularly and actively engage with market participants to understand what data and information is helpful to support market development. While there will be minimum legal requirements set out in licences, we expect DNOs to use their stakeholder engagement to consider the most effective format and frequency of publishing that data to ensure it is user-friendly. The information must be easily accessible and navigable. We expect this includes publishing data in machine-readable formats.</p>	<p>Section 5.3: Comprehensive market information</p>	<ul style="list-style-type: none"> • Work with flexibility providers to understand and produce the information they need to assess our tenders, started in 2020 and update following feedback. • Hold bi-annual workshops with flexibility stakeholders when new flexibility services requirements are issued. Gain feedback on the usefulness of the information and adapt information to encourage flexibility provision from domestic customers, starting in 2022. • DSO Stakeholder Panel to guide us to adopt best practice from other industries, starting in 2023. • DSO Stakeholder Panel to guide our approach to data for electricity users in vulnerable circumstances, starting in 2023. • Collaborate with other system and network licensees to avoid stakeholder fatigue, starting in 2023.
<p>3.1.4 DNOs should, where reasonable, tailor both their information provision and engagement approaches to reflect different needs of potential market participants, including groups in vulnerable situations. In many instances, collaboration across DNOs in engagement is expected to reduce duplication, make it easier for stakeholders to engage and avoid stakeholder fatigue.</p>	<p>Section 5.1: Data and data-sharing</p> <p>Section 5.3: Comprehensive market information</p>	<ul style="list-style-type: none"> • Provide a data portal on our website in 2022 and enhance in RIIO-ED2 to: <ul style="list-style-type: none"> ◦ Download our published data ◦ Visualise it using a visualisation tool • APIs will allow data-sharing services/platforms to retrieve and host Electricity North West published data, starting in 2023 and enhanced throughout RIIO-ED2. • Develop and consult on a stakeholder engagement strategy, plan for distribution flexibility services and energy efficiency and the sharing of market information in 2023. • DSO Stakeholder Panel to guide us to adopt best practice from other industries starting in 2023. • Publish information to maximise the opportunities to provide flexibility services to Electricity North West and to any other party, started in 2021 and enhance in RIIO-ED2. • Work with flexibility providers to understand and produce the information they need to assess our tenders, started in 2020 and will update following feedback. • Hold bi-annual workshops with flexibility stakeholders when new flexibility services requirements are issued. Gain feedback on the usefulness of the information and adapt information to encourage flexibility provision from domestic customers; starting in 2022. • Collaborate with other system and network licensees to avoid stakeholder fatigue starting in 2023.
<p>3.1.5 DNOs should seek to ensure the information they publish is as accurate and unbiased as reasonable (ie correct at time of publication, as close as possible to the actual value and not skewed in any direction).</p>	<p>Section 4.1: Stakeholder involvement in DSO transition</p>	<ul style="list-style-type: none"> • DSO Stakeholder Panel to oversee the data access starting in 2023. • New DSO Compliance Officer to report on compliance, including provision of data, starting in 2023.

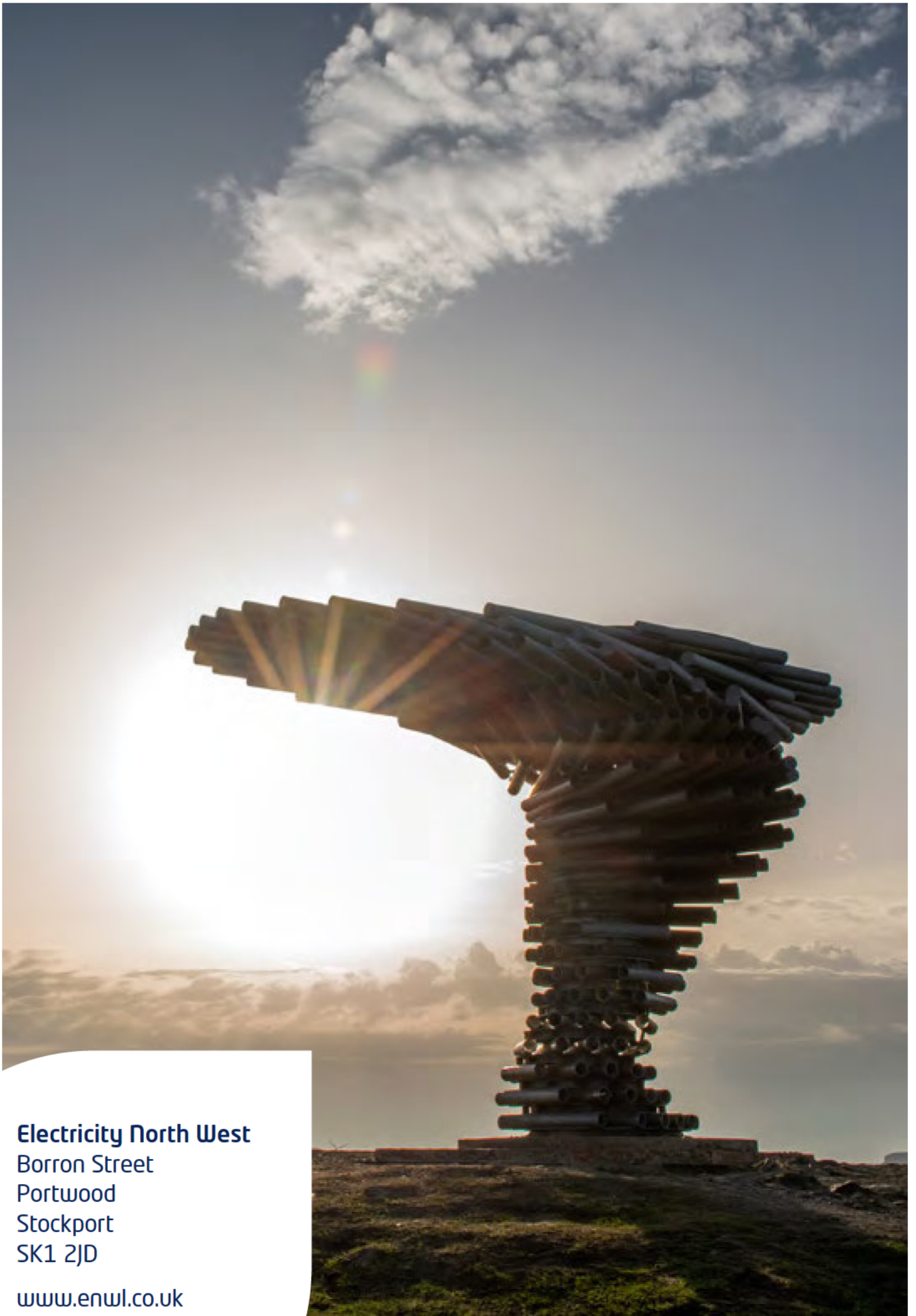
Baseline Expectation description	Document ref	Business plan actions
<p>3.2.1 DNOs to have clear processes in place for developing and amending distribution flexibility services products, contracts, and qualification criteria, that are, wherever possible, standardised. The processes should be transparent and participatory, involving other DNOs, the ESO, and current and potential distribution flexibility service providers.</p> <ul style="list-style-type: none"> • DNOs should also coordinate and engage with third party platform providers, who can offer system value by providing new routes to market and driving whole system outcomes. DNOs should not prevent the emergence of this sector and should enable third party platforms to ‘plug-in’ to DNOs’ flexibility procurement processes. Products and contracts should be adaptive to reflect prevailing system needs, type, and availability of flexible resources. The objective of these processes is to enable as wide participation in distribution flexibility services markets as possible. 	<p>Section 5.3: Flexibility services products</p> <p>Section 5.3: Flexibility services contract</p> <p>Section 5.3: Future governance</p> <p>Section 5.3: Publishing flexibility requirements</p> <p>Section 5.3: Marketplace platforms</p>	<ul style="list-style-type: none"> • Review the flexibility products that we tender for ensuring they meet the network and flexibility provider’s needs, started in 2021, now annual review. • Ensure new products are developed in collaboration with other licensees and stakeholders following the same parameters and terminology as previously defined, started in 2021. • Continue with the commitment to standardisation and simplification of information to help reduce barriers to participation and aid market liquidity; started in 2020. • Work with stakeholders and other licensees to establish open governance arrangements for the standard flexibility products and common contracts, started in 2020. • Ensure ancillary and flexibility service products and associated contracts be defined in a future electricity network code with views shared from 2020. • Remove the current materiality threshold to give greater granularity on the utilisation of HV and LV network at the end of RII0-ED1. • Use monitoring and aggregated smart meter data to share known hotspots of network issues from HV and LV heatmap data, starting 2023. • Introduce competition in the provision of marketplace platform services by tendering for these marketplace services at least annually, starting in 2023. • Look for new and innovative ways to encourage new providers to the marketplace by developing new access routes for network users, starting in 2023.
<p>3.2.2 DNOs should identify the optimum combination of longer and shorter term lengths of markets and contract lengths reflecting the network need. Needs should be neutrally defined, to allow for a range of flexibility providers to participate. This will help improve market liquidity and the opportunities for innovation and dynamic competition. Individual decisions and frameworks for deciding market timeframes and contract lengths should be transparent, informed by stakeholders and justified as being the most economic and efficient solution. Notwithstanding, deviations from the standard should be justified with clear governance processes for managing change that should be clearly communicated.</p> <ul style="list-style-type: none"> • DNOs should have clear, comprehensive and transparent mechanisms and associated commercial structures for coordinating distribution flexibility services and ESO flexibility services procurement. DNOs shall not act as the commercial route for DER accessing ESO flexibility services. Transparent (and possibly tripartite) commercial agreements may be required to reflect the potential effects of DER dispatch on distribution system operability and the role of DNOs in setting dispatch parameters (as set out in Activity 2.1 and 2.2). These agreements should remove exclusivity clauses as far as possible, including with regard to non-firm connections. Coordination on dispatch parameters should enable a closer to real-time understanding of what DER needs to be armed and available for a particular service, and what can be available to provide other services. • DNOs should consider arrangements to support DERs to provide services that meet both DNO and ESO needs. 	<p>Section 5.3: Flexibility contract lengths</p>	<ul style="list-style-type: none"> • Use the Common Evaluation Methodology tool to evaluate the provision of flexibility, and the optimum contract length in terms of cost-effective investment, started in 2021. • Continue stakeholder engagement to gauge stakeholder feedback on the optimum length of contracts, started in 2020. • If there is little, or no competition we will use contracts for more than one year but only after reviewing the availability and capability of potential providers. We will not renew a contract more than four times, started in 2021. • Review flexibility contracts annually and where new opportunities for flexibility arise such as for connections-driven reinforcement, longer-term contracts will be trialled, while maintaining market stimulation in the area to provide liquidity and longer-term network security, starting in 2023. • Shorter-term contracts will also be utilised for network resilience issues such as disruptive failures and storm resilience, helping to reduce reliance on carbon intense mobile generation, started in 2021.

Baseline Expectation description	Document ref	Business plan actions
<p>3.2.3 DNOs should make available the necessary data to enable secondary trading, for example capacity and other peer-to-peer trading. Enabling includes defining, communicating and justifying the parameters in which these trades can take place for operability purposes.</p>	<p>Section 5.3: Secondary trading</p>	<ul style="list-style-type: none"> • Facilitate the trading of capacity between parties, acting as a neutral market facilitator, whilst maintaining network continuity, ensuring trades are fair and don't compromise network security, starting in 2022. • In the tender for marketplace platform services seek solutions that facilitate secondary trading to encourage providers to come forward with options, starting in 2023. • Work with the other network operators to establish a range of fair and transparent market rules to facilitate peer to peer trading, started in 2020 with TEF projects. • Ensuring that the virtual trading of capacity is fair and that neither party is involved in disreputable trading, starting in 2024.
<p>3.2.4 Market support services, such as pre-qualification, credit-checking and settlement must enable simple and cost-efficient participation in markets. DNOs should enable, and never prevent, the opportunity for third parties to provide these services where they could do so more efficiently.</p>	<p>Section 5.3: Marketplace platforms</p>	<ul style="list-style-type: none"> • Introduce competition for marketplace platform services by tendering for these services at least annually, starting in 2023.
<p>3.2.5 DNOs to introduce other proportionate measures, developed with robust stakeholder engagement, to identify and address actual and perceived conflicts between its DSO and network ownership roles or other business interests. The introduction of such measures should enable DNOs to efficiently plan, develop and use their network, taking into account and using flexible alternatives to network reinforcement where efficient for the system, in a visibly neutral way. At a minimum, this should include demonstrable executive-level accountability and board-level visibility of key DSO decisions across the planning, operation and market facilitation functions. This should also include clear and separate decision-making frameworks, supported by independent oversight, such as external auditing, to promote transparency and enable scrutiny. Additionally, to support the justification of DNOs' proposals as proportionate, we expect DNOs to set out conflict mitigation options that were considered but not proposed, including legal separation if this is not part of the DNO's suite of proposals. As part of their justification, DNOs should include the available supporting information on the likely costs, timings and implications of these alternative options or a narration of initial views.</p>	<p>Section 4.2: Our proposals for stakeholder involvement in ED2</p> <p>Section 9.1: DSO Stakeholder Panel Terms of Reference</p> <p>Section 4.3: Separation of DSO responsibilities and managing conflicts of interest</p> <p>Section 5.3: Marketplace platforms</p>	<ul style="list-style-type: none"> • Establish an independent DSO Stakeholder Panel in 2023, with responsibilities in the five areas of data, stakeholder engagement, decisions review, methodology review and performance evaluation. • Draft terms of reference for the DSO Stakeholder Panel, detailing independence and responsibilities; initial draft completed in 2021. • Form a new DSO directorate in 2021, led by a new DSO Director responsible to the ENWL CEO and Board, to separate DNO and DSO activities and enable the DSO to focus on the efficient and transparent provision of network capacity. • Use ENWL's Table of Accountabilities approach to define the roles and responsibilities for DNO and DSO activities, starting in 2021 and updated as required. • Share the formal separation details the DSO Stakeholder Panel so that they can assure themselves that there is full separation of DSO activities by 2023. • Appoint an independent DSO Compliance Officer in 2023 to ensure an appropriate separation of responsibilities and to manage actual or perceived conflicts of interest. • The DSO Compliance Officer will be responsible for monitoring and reporting compliance with an annual compliance report shared with the ENWL Board and DSO Stakeholder Panel, starting in 2023. • Introduce competition for marketplace services by tendering for marketplace platform services, starting in 2023.

9.6 Glossary

A&FLC SCR	Access and Forward Looking Charges Significant Code Review - the Ofgem led review of the distribution connection and use of charging arrangements	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
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	DNO	Distribution network operator - company licensed to distribute electricity in Great Britain by the Office of Gas and Electricity Markets (Ofgem)
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	DSO	Distribution system operation
ATLAS	Architecture of Tools for Load Scenarios project which developed methodologies, prototype tools and specifications to develop detailed loading scenarios	Dynamic	A post-fault flexibility service that keeps the power flowing during an unplanned network event
Black Start	The name given to the re-energisation and operation of the whole GB electrical system after partial or whole system shutdown	EDTF	EDTF, Energy Data Task Force has developed a set of recommendations for how industry and the public sector can work together to facilitate greater competition, innovation and markets in the energy sector through improving data availability and transparency
BEIS	BEIS Department for Business, Energy & Industrial Strategy	ENA	ENA, Energy Networks Association – industry body which represents transmission and distribution network operators for gas and electricity in the UK and Ireland
CEM and Tool	The common evaluation methodology developed in the 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 ED1	Flexible asset	An asset on the distribution network that can be controlled in real-time for actively managing the operation of the distribution network
CIM	Common Information Model – a protocol for sharing electrical network data between parties	Flexible connection	A connection to the distribution network that has agreed flexible arrangements, generally the curtailment of import or export capabilities at given conditions
CLASS	The innovation project, Customer Load Active System Services, that proved that the demand on the network can be varied by actively managing the network voltage; and the reduction in demand can be used by system and network operators	Flexible/ flexibility services	Distributed energy resources connected to our networks can increase exports (generate more) or reduce imports (consume less) when instructed by the network and receive payment in return
Connect & Manage	The approach, devised through an innovation trial, to allow a defined number of new Low Carbon Technologies to connect to the distribution network, without reinforcement. Once the defined number is achieved monitoring equipment is installed to provide accurate information on the operation of the network	Flexible Power	A cloud based platform for the scheduling and dispatch of distribution flexibility services
Data Best Practice guidance	Developed as part of the Modernising the Energy Data agenda this publication by Ofgem and BEIS defines their overarching expectations for how access to and the exchange of energy data between organisations is undertaken and how energy data is best used	Flexr	A proposed data sharing service being developed by ElectraLink
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	FLISR	A fault restoration application implemented as part of the new Network Management System by Schneider Electric. The algorithm within the application was developed jointly between Schneider Electric and EWNL
		HH	Half hour
		HV	High voltage
		ICCP	Inter Control room Communication Protocol
		IDNO	Independent distribution network operator
		IFI	IFI Innovation Funding Incentive - funding allowance replaced by NIA in 2015
		IPSA	A software system planning package used for HV & EHV network modelling
		Key enablers	The technology, data and engineering competencies and capabilities needed to deliver DSO functions

LCN Fund	Low Carbon Networks Fund - funding provided to DNOs from Ofgem for innovation research projects during the previous price control period	Restore	A post-fault flexibility service that enables network restoration (ie gets the lights back on) following an unplanned network event
LCT	Low carbon technology such as electric vehicles, electric heat pumps, solar and wind energy	RiIO-ED2	Electricity distribution price control period, 2023-2028
LFDD	Low Frequency Demand Disconnection	ROCBA	Real Options Cost Benefit Analysis – a tool for the financial evaluation of a set of intervention options, including the counterfactual of traditional reinforcement
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 licence condition 25 and the Form of Statement	Transmission Operator (TO)	TOs own, operate and maintain the transmission networks. There are three licensed TOs in Britain, and each is responsible for a regional transmission services area
LV	Low voltage	Secure	A pre-fault flexibility service that provides a scheduled response to manage network loading
MOM	Merit Order Management – ENWL's system that derives the merit order or curtailment stack, using the curtailment index, which is shared with the ANM system for delivery	Smart Street	The innovation project, Smart Street, that proved that capacity can be released in the LV network by actively managing the network configuration and the network voltage. The lowering and active stabilisation of the LV network voltage reduced the customers' demand resulting in energy savings for all connected customers
National Grid ESO	National Grid Electricity System Operator	Sustain	A schedule flexibility services that provides a scheduled response to prevent network constraints
Net Zero carbon/Zero carbon	The achievement of balancing carbon dioxide emissions with carbon removal or eliminating carbon dioxide emissions altogether	UKERC	UK Energy Research Centre
Neutral Market Facilitator (NMF)	A transparent, neutral market for flexible services, providing attractive opportunities for customers of all scales to respond to requests for flexibility, allowing existing and new renewables to be fully utilised		
NGET	National Grid Electricity Transmission – electricity transmission network in England and Wales		
NGFES	National Grid's Future Energy Scenarios		
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 – a electricity network control system		
Ofgem	Office of Gas and Electricity Markets – the government regulator for gas and electricity markets in Great Britain		
Ofgem DSO functions	A list of 19 key distribution system operation functions published by Ofgem designed to describe the activities performed by a DNO in distribution system operation		
Open Networks Project (ONP)	Open Networks Project - a key industry initiative to deliver government policy that will transform the way our energy networks work and help deliver the 'smart grid'		
Prosumer	A person who both consumes and produces a product, in this case electricity RiIO-ED1 Current electricity industry price control period, 2015-2023		
QUEST	The innovation project, QUEST, initiated in 2020 is aiming to prove that the holistic management of the network voltage across all network levels releases additional network capacity and reduces network losses		



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