WESTERN POWER DISTRIBUTION

Serving the Midlands, South West and Wales

Our Business Plan 2023 – 2028 First draft

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Our Chief Executive, Phil Swift, sets out WPD's commitment to consumers for RIIO-ED2

The energy sector is currently undergoing a period of significant change as the UK works towards achieving a net zero carbon future. Our Business Plan for RIIO-ED2, which runs from 2023 to 2028, sets out how we will continue to deliver high standards of safety, reliability and customer service while adapting to the changing environment in which we operate.

In RIIO-ED1, we have already faced many challenges, including most recently the COVID-19 pandemic and the need to do our bit to help revive the economy. We have responded by setting up our 'In This Together - Community Matters' fund and have already awarded £1 million to support over half a million vulnerable customers who have been worst affected by the pandemic. We have also committed to investing up to £90m before the end of this price control to support the green recovery.

We expect to face many more new challenges during RIIO-ED2, including the need to ensure capacity is available for charging vehicles, powering heat pumps and allowing more connection of distributed generation and energy storage. At the same time we will continue to support vulnerable customers and deliver the class leading service that our customers expect.

We must embrace new ways of working and build upon our industry leading use of flexibility in the way that we operate the system, as well as tackling the environmental challenge of reducing our own business carbon emissions and enhancing network resilience to combat increasing cyber threats. In our Business Plan, we recognise our responsibility to respond to these challenges and to do so in a way that is as cost effective as possible.

I am extremely proud of the fact that our Business Plan is being co-created with stakeholders. We have gone further than ever before to develop a robust stakeholder engagement process which ensures that we understand and meet their needs and expectations. So far during the RIIO-ED2 business planning process, we have interacted with over 4,500 stakeholders through a multitude of events and group sessions and will continue to broaden this interaction. Each stage has enabled stakeholders to influence our decision-making processes and shape our Business Plan proposals. The input and feedback from our independent Customer Engagement Group has provided robust challenge and scrutiny at every stage of the process.

Our stakeholders have so far identified a number of high level priorities which they want to see in our plan. These include:

- Maintaining our high level of excellent customer service
- Making sure no one is left behind in the transition to a smart network, especially customers in vulnerable circumstances and in fuel poverty
- Continuing to reduce power interruptions and power cut durations
- Protecting customers' data and ensuring that our network is not affected by a cyber attack
- Enabling the government's net zero carbon initiative to be delivered before 2050
- Setting a target for our internal business carbon footprint ambition to be well ahead of 2050
- Supporting our Community Energy groups to deliver community-led renewable projects.

We are publishing this draft version of our Business Plan early so that you have the opportunity to review our proposals and further influence our Plan.

Thank you for your support,

Phil Swift - WPD Chief Executive

Foreword

Dear Stakeholder,

Achieving a net zero carbon future is sparking an exciting transformation across the energy sector. Ambition and dynamic delivery will be key to answering our customers' calls for the creation of a low carbon community, while continuing to keep the lights on and deliver excellent customer service. So we're proud to share this first draft of our Business Plan with you and to ask for your views on our vision for the future of our network.

We will be submitting our Business Plan for the price control period 2023 to 2028 to our regulator Ofgem in July 2021. Before we do, we believe it's critical that you, our stakeholders, have the opportunity to provide feedback. In fact, we think this is so important that you will be given the chance to see our draft plan **twice**, as we refine it before the first submission to Ofgem – once now and again in March 2021.

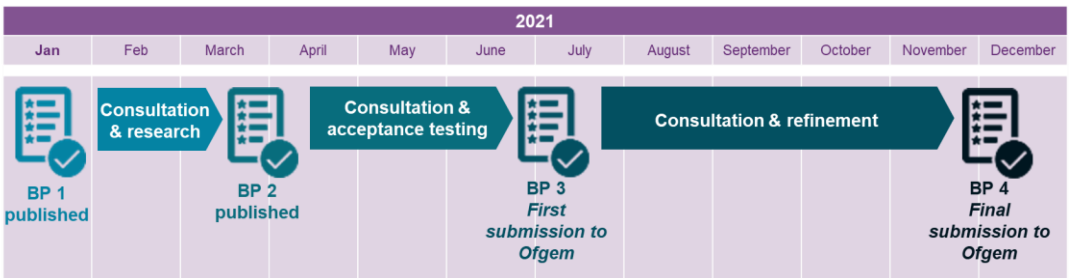
From the very beginning, this draft Business Plan has been co-created with our stakeholders, following an enhanced and robust approach to stakeholder engagement. We engage with stakeholders annually through various routes, but our workshops in February 2020 were the start of our specific engagement on the Business Plan. We have since involved more than 4,500 customers at numerous engagement sessions. We are now in a position for our stakeholders to review and corroborate our plan, as part of our ongoing engagement.

The most important goal for us is to provide the services our customers need and want. By liaising closely with stakeholders, we have built a challenging and ambitious Business Plan.

We hope you'll agree this first draft of our Business Plan captures all the key priority areas and makes commitments that accurately reflect our stakeholders' expectations and establishes a network for a low carbon future. We are sharing the plan at this early stage to hear from you if we've got it right. **Are we on the right track?**

Our plan will evolve through 2021 as further guidance from Ofgem becomes available, including the final Business Plan Guidance document, detailed financial information, specific scenarios for the take-up of low carbon technologies, and the charging methodology for connections.

However, even without the further guidance we felt it was important to share with you as much as we can at this stage and obtain your views. Hence this is the first of two consultations we will be undertaking in 2021 as outlined in the timetable below.



BP 1: January 2021 – Consultation on the First Draft Business Plan
BP 2: March 2021 – Consultation on the Second Draft Business Plan
BP 3: July 2021 – First submission to Ofgem for its Challenge Group
BP 4: December 2021 – Final submission to Ofgem

Your feedback from this consultation will be incorporated into our Second Draft Business Plan which will also include additional chapters on how we are going to finance our plan and how we will deal with uncertainty throughout RIIO-ED2.

I would like to take this opportunity to thank you for your support and your feedback, both of which are extremely important to everyone at WPD, as we plan a network for the future together.

Please see below for details on how to respond to this consultation.

Mark Shaw
RIIO-ED2 Business Plan Manager

How to respond to this consultation

Please take the time to read though our first draft Business Plan and use the accompanying stakeholder consultation document to give us your views.

Visit: yourpowerfuture.westernpower.co.uk/
https://yourpowerfuture.westernpower.co.uk

Email: yourpowerfuture@westernpower.co.uk

Write to us at:
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Western Power Distribution
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Chapter 1

A summary of our plan

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1. A summary of our plan

Who we are and what we do

1.1 Western Power Distribution (WPD) is a Distribution Network Operator (DNO) and a Distribution System Operator (DSO), responsible for distributing electricity to 7.9 million customers. We look after a network of wires, poles, pylons, cables and substations; distributing electricity to homes and businesses across the West Midlands, East Midlands, the South West and South Wales.

Figure 1.1 Geographical area map

1.2 The distribution network sits between National Grid transmission network and our customers. The drive towards a low carbon economy has led to increasing levels of generation directly connected to our distribution network along with new forms of electricity demand such as electric vehicles, heat pumps and battery storage.

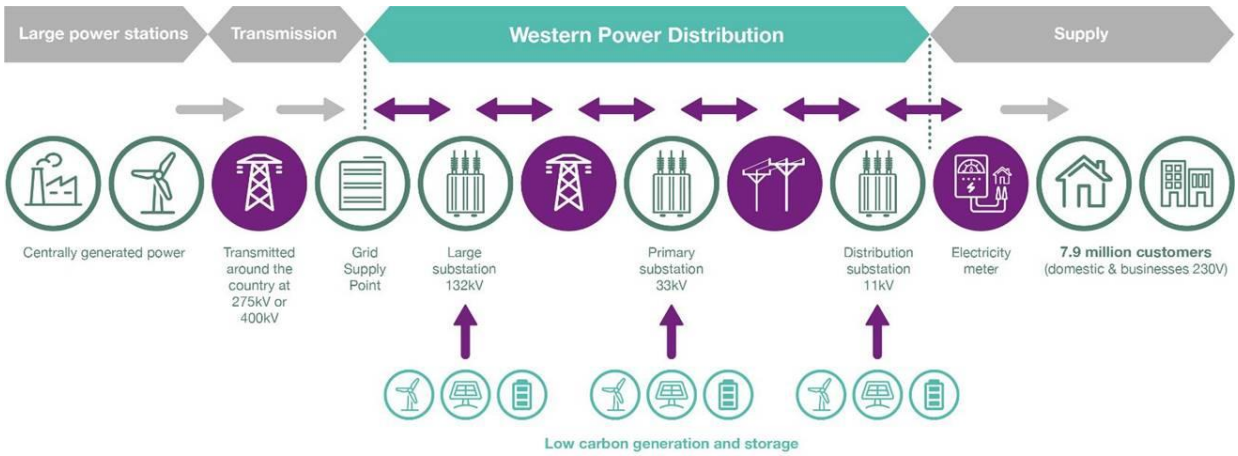

Figure 1.2 Electricity network system

1.3 Our main responsibilities to our customers are illustrated below:

Figure 1.3 Main responsibilities to our customers

1.4 The energy system is undergoing a huge transition because of the changes to electricity generation and use, including the growth of distributed generation and the increasing popularity of electric vehicles and heat pumps. These changes and the associated increases in demand have required us to develop new processes and systems, such as adopting flexible solutions to manage different power flows on the network. To continue to operate a smarter, more efficient energy system, we are carrying out the functions of a Distribution System Operator.

1.5 Our costs typically make up around 17% of an average domestic customer's yearly electricity bill, (as shown in Figure 1.4 below) charged by suppliers. This is the equivalent of £96 per year on the bill.

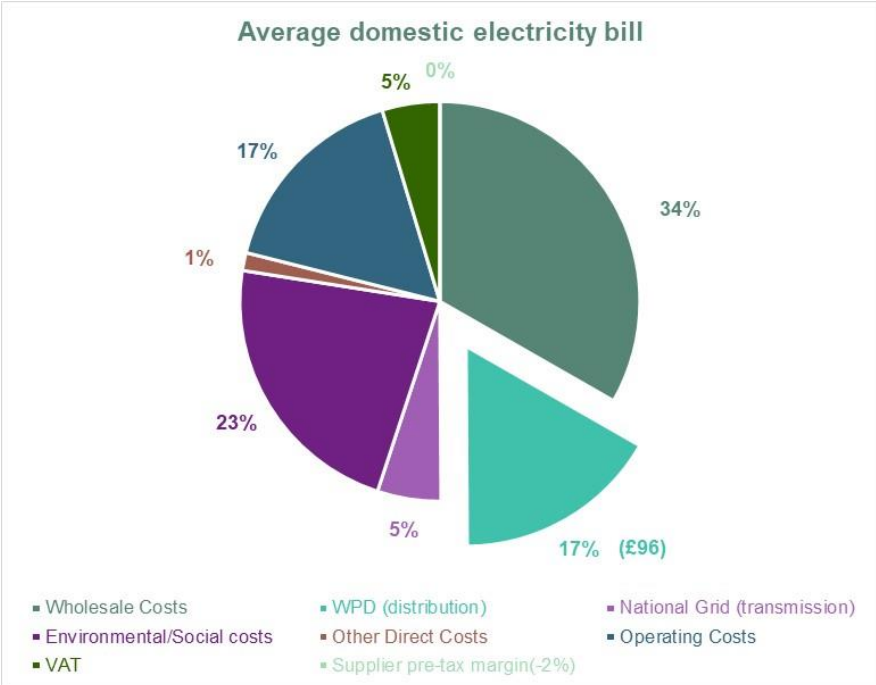

Figure 1.4 Average domestic electricity bill

What are we delivering in RIIO-ED1

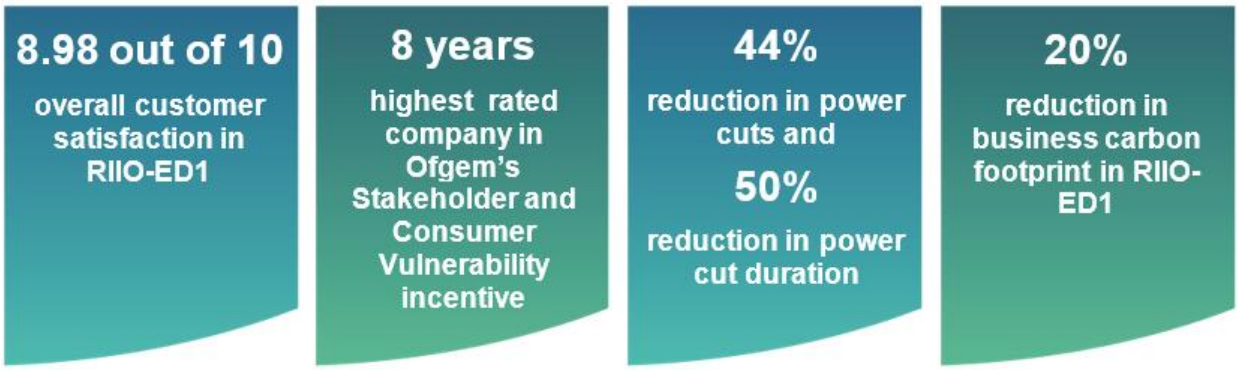

Figure 1.5 Summary of our RIIO-ED1 performance areas

1.6 We operate an efficient business model, with a flat organisational structure that enables us to deliver excellent performance levels for our customers at a low cost. We are on track to meet or exceed the commitments that we made to customers for RIIO-ED1.

1.7 We pride ourselves on delivering excellent customer service and are the top-performing DNO for overall customer satisfaction with an average score of 8.98 out of 10. We continued to deliver fast telephone response times of 1.91 seconds in 2019/20, along with quick complaint resolution and effective mechanisms for communication with our customers. The number of customers signed up to our Priority Services Register (PSR) has increased from 1.3 million in 2016 to 1.9 million in 2020.

1.8 We have a vital part to play in supporting our vulnerable customers and, during the course of RIIO-ED1 we have worked with partner organisations, to enable 70,000 customers to save over £27 million on their bills. We have consistently been the highest scoring DNO for Ofgem's Stakeholder Engagement and Consumer Vulnerability incentive and are in a strong position to ensure that vulnerable customers are not left behind in a smart future, thanks to a range of successful initiatives.

1.9 We are committed to keeping the power on and restoring it quickly when it goes off. We continue to improve our performance by reducing fault response times, for instance, by using technology to produce a 3D imagery of tree proximity to overhead lines and undertaking post-fault helicopter inspections of our circuits.

1.10 We have achieved a 20% reduction in our business carbon footprint during RIIO-ED1, significantly exceeding our original target of 5%. We also intend to replace 643 diesel vehicles with electric vehicles by 2023 which will lead to further reductions.

1.11 We have seen significant changes in the way electricity is generated and consumed, largely as a result of the growth in electric vehicles and the use of heat pumps for domestic heating. We were the first DNO to publish a Distribution System Operator plan as well as a Distribution Future Energy Scenarios document. We are also the first to commit to a six monthly procurement cycle for flexibility services. To date, the Flexible Power brand has been utilised to contract flexibility services totalling 440MW, the highest level in the industry. The use of flexibility defers the need to undertake conventional reinforcement on our network and as a result delays the need to invest.

1.12 In Chapter 2 – "We deliver on our commitments" we provide full details of what we are delivering in RIIO-ED1.

What is RIIO-ED2?

1.13 The Office of Gas and Electricity Markets (Ofgem) regulates how much revenue we can earn and what we must deliver under the RIIO-ED2 model. RIIO-ED2 stands for Revenues = Incentives + Innovation + Outputs in Electricity Distribution. It is the second price control under this model.

1.14 The RIIO framework:

- Incentivises companies to deliver leading performance in areas of customer service, network performance, environment, connections and efficiency
- Requires innovation which includes funding available for projects under central funding mechanisms
- Requires companies to deliver a set of outputs

1.15 This Business Plan outlines the network investment we propose to deliver for the period from April 2023 to March 2028, how much it will cost and the benefits to customers and stakeholders.

1.16 The commitments fall into three output categories, which are:

- Meeting the needs of consumers and network users
- Maintaining a safe and resilient network
- Delivering an environmentally sustainable network

Our Business Plan is co-created with stakeholders

1.17 It is important that we provide the services that our customers require. We have listened to stakeholder feedback and incorporated challenging and ambitious commitments into our Business Plan that go beyond our targets for RIIO-ED1. These commitments are based on priorities identified by our stakeholders during our extensive engagement programme.

1.18 We have followed an enhanced and expanded approach to stakeholder engagement in order to co-create the Business Plan. Beginning with a blank sheet of paper, the process involved not only a greater number of engagement activities but also increased opportunities for stakeholders to review and collaborate on the draft plans. We have engaged with over 4,500 customers so far - more than ever before - through strategic stakeholder workshops, topic-specific workshops and ‘surgeries’ for local authorities. Customers have shaped the outcomes themselves, leading to the identification of 67 core commitments which can be used to measure our performance throughout RIIO-ED2.

1.19 Throughout the engagement process, we have held regular meetings with our Customer Engagement Group (CEG). The broad range of expertise of our CEG members has proved an excellent source to challenge us throughout the production of the Business Plan. The CEG was instrumental in the design of our engagement plan, encouraging us to be ambitious and industry-leading in our approach.

Principles of our RIIO-ED2 Business Plan

1.20 Our RIIO-ED2 Business Plan has been built on key principles. These require that it is:

- Co-created with our stakeholders and supported by them.
- Our Plan – ‘prepared with our stakeholders for delivery by us’
- Aligned with WPD’s purpose and values.
- Affordable for all of our customers.
- Sustainable and will enable net zero before 2050

A summary of what we will deliver during RIIO-ED2

1.21 Our RIIO-ED2 Business Plan will ensure that we continue to provide excellent levels of network performance and industry-leading customer service, maintaining efficient costs while ensuring that the network is equipped to support the government's net zero carbon initiative.

Figure 1.6 RIIO-ED2 key core commitments

Creating a Sustainable Future

1.22 Our RIIO-ED2 Business Plan recognises that we will play a critical role in supporting the UK to move to a low carbon future. Network investment requirements are informed by our Distribution Future Energy Scenarios which provide a forecast of future electricity, based upon national scenarios and regional low carbon plans. We will need to spend more on providing the network capacity required, but we are incorporating the use of lower cost alternatives such as using flexibility services instead of conventional reinforcement.

1.23 Our plans take into account the need to work closely with other electricity distribution and transmission companies as well as other utilities and stakeholders. This whole system collaboration is essential to identify solutions in order to make informed investment decisions, tackle the limitations of the network and ensure that data from the network is available to those who need it.

Chapter 2

We deliver on our commitments

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2. We deliver on our commitments

Summary

2.1 It really matters to us that we build on our successes during RIIO-ED1 to deliver even more for our customers in RIIO-ED2. By delivering on our current commitments, we continue to demonstrate to stakeholders our determination to achieve the goals we set ourselves. We have learnt from our achievements and as we approach RIIO-ED2 and the challenges of a rapidly-changing energy landscape, we are more determined than ever to be ambitious, to exceed our customers' expectations and to deliver on our latest commitments.

2.2 WPD has been recognised for delivering commitments for some time. For RIIO-ED1, we were the only Distribution Network Operator to be fast-tracked by the regulator. This means that our Business Plan covering all four licence areas was judged to be of a sufficiently high standard and well justified to be accepted in full. Ofgem recognised WPD as the leading company for customer service and for our ability to reduce costs and operate efficiently. During RIIO-ED1 we have continued to focus on delivering our commitments and we on track to deliver what we promised, and more.

2.3 We have a strong belief that utilising in-house regional resources is key to cost effective and efficient delivery which is why we use local teams to serve each local area. Our staff are part of these communities. They therefore know the area, network and many of our customers, enabling us to provide efficient, high quality customer service.

2.4 This section explains not only why we are ahead of our targets for RIIO-ED1 but how we will go even further before the end of this period. In RIIO-ED1, WPD is the top DNO for customer satisfaction with an average score of 8.98 out of 10. Also we have achieved many other successes such as significantly improving our network reliability and reducing our business carbon footprint.

2.5 We also have gone beyond commitments we made at the start of the price control period. We were the first DNO to set up a Distribution System Operator operation which has helped to accelerate the move to local generation and flexible services. We have also supported local community projects through a £1m "In This Together Community Matters" fund" during the COVID pandemic and committed up to £90 million to the 'green recovery'.

2.6 We have achieved these outcomes by utilising the allowances that we have been provided in RIIO-ED1, ensuring that customers receive service improvements and value for money.

Our performance in RIIO-ED1

2.7 We have a strong track record of delivering excellent levels of performance for customers and are confident we can build on the successes of RIIO-ED1 to deliver our RIIO-ED2 plan.

2.8 The customer service experience and the safety of our customers, contractors and staff are our top priorities. We are on track to deliver or exceed our original RIIO-ED1 targets and, as we continue to respond to the changing needs and expectations of our customers, our focus will be to go on outperforming these targets.

RIIO-ED1 Output Performance

Safety

- ✓ Complying with health and safety law
- ✓ Reducing accidents
- ✓ Enhancing substation security
- ✓ Educating the public

Reliability

- ✓ Improving network performance
- ✓ Meeting our Guaranteed Standards of Performance
- ✓ Reducing the number of Worst Served Customers
- ✓ Making our network more resilient

Environment

- ✓ Making it possible for more people to use low carbon technologies
- ✓ Reducing network losses
- ✓ Reducing the carbon footprint of the business
- ✓ Reducing the environmental risk of leaks from equipment
- ✓ Improving the appearance in National Parks and Areas of Outstanding Natiral Beauty

Connections

- ✓ Providing a faster and more efficient connections service
- ✓ Improving communications with customers
- ✓ Enhancing engagement with major customers
- ✓ Meeting our Guaranteed Standards of Performance
- ✓ Further developing a competitive market

Customer Satisfaction

- ✓ Improving customer service
- ✓ Improving our telephone response times
- ✓ Enhancing our communication with customers
- ✓ Involving stakeholders
- ✓ Reducing complaints
- ✓ Promoting Guaranteed Standards of Performance awareness

Social Obligations

- ✓ Improving understanding of vulnerability
- ✓ Improving the data held on the Priority Services Register
- ✓ Improving the services provided for customers in vulnerable situations
- ✓ Reducing fuel poverty by supporting customers to access help

Figure 2.1 RIIO-ED1 Output Performance

Proven delivery of excellent customer service

2.9 We understand how important excellent customer service is for our 7.9 million customers and are determined to be industry-leading in this area.

2.10 We have consistently been the top performer with a five year average result for customer satisfaction of 8.98 out of 10 during RIIO-ED1.

2.11 Customers are at the heart of everything we do. Our staff and contractors are customers too, so we ask them 'to treat customers as you want to be treated' which we call the golden rule.

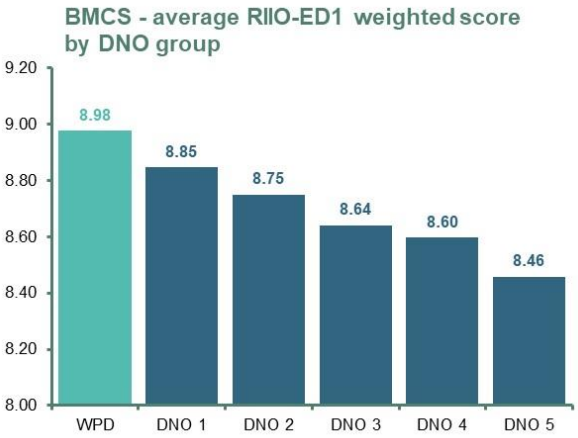

Figure 2.2 Broad Measure of Customer Satisfaction

An external view on our performance ……..

2020 ENGAGE AWARDS WINNER

Gold - *Best Customer Service Team*

2020 ENGAGE AWARDS WINNER

Gold - *Best Customer Contact Strategy in a Crisis*

2020 ENGAGE AWARDS WINNER

Gold - *Best Innovation in Customer Engagement*

2020 ENGAGE AWARDS WINNER

Bronze - *Best Use of Training*

Steve Hurst, Chair of the International Engage Awards judges said: *"Our winners came from a variety of industries, but **we must give a special mention to our triple winner Western Power Distribution**, who were named winners in 'Best Customer Service Team', 'Best Customer Contact Strategy in a Crisis' and 'Best Use of Innovation in Customer Engagement'. **This is a real testament to the team to achieve so much in such uncertain times."***

Figure 2.3 International Engage Awards 2020

2.12 We also aim to 'get things right first time' which means that whoever is dealing with the customer takes responsibility for resolving that query to the customer's satisfaction. We recognise that it is extremely frustrating for a customer to be passed around an organisation or, worse still, to be unable to speak to someone about their enquiry.

2.13 We believe in talking to our customers. We have regionally based, in-house contact centres, where we answer calls within an average of two seconds. We ensure excellent customer service by regularly engaging with customers through a range of channels, including annual stakeholder workshops. Engagement helps us to understand and refine our approach in line with customer need.

2.14 In December 2020, we won four awards at the 2020 International Engage Awards for our outstanding customer service, fighting off stiff competition from the likes of Microsoft, Sainsbury's, Coca-Cola, DPD, British Gas and Royal Bank of Scotland. We picked up three gold awards and one bronze and even received a special mention from Steve Hurst, Chair of the International Engage Awards judging panel.

2.15 We recognise that we are not perfect and that things go wrong. When this happens, we will resolve complaints quickly and use this as an opportunity to show our customers the excellent customer service we provide. This approach has enabled us to resolve 89% of complaints in one day in 2019/20. Ultimately, we aspire to turn every complaint into a 'thank you'.

Proven delivery of an industry leading social obligations strategy

2.16 We have invested £9.5 million since 2015 to support our vulnerable and fuel poor customers. We have also expanded our activities, tailoring our approach to what our customers tell us they want from our engagement programme.

2.17 We are committed to helping customers in vulnerable circumstances which is why we have taken significant steps to improve our understanding of customer vulnerability during RIIO-ED1.

WPD's social obligation success

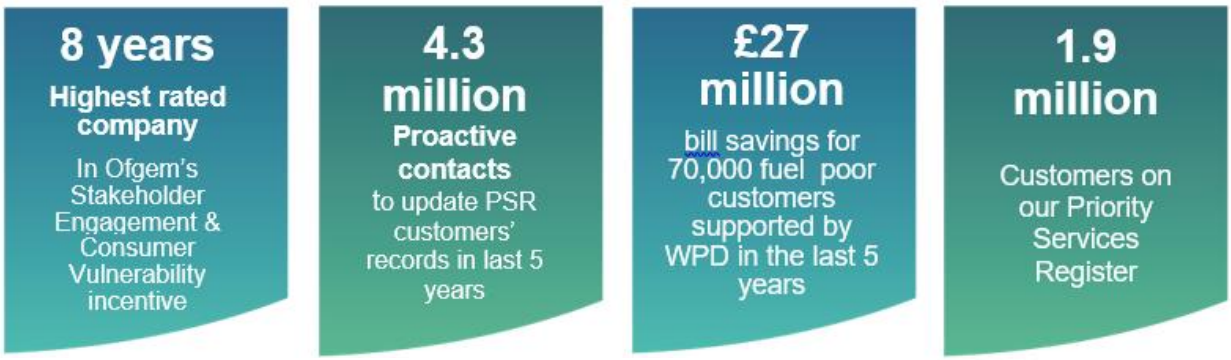

Figure 2.4 WPD's social obligations success

Improvements to network performance

2.18 Our customers deserve a reliable electricity supply. A growing reliance on electronic equipment, the move to electric vehicles and heat pumps, and an increase in home working makes this supply more critical than ever. Our customers tell us that network performance is a high priority and that it makes a real difference to people's lives. We have a proven track record of improving network reliability and have made further progress during RIIO-ED1.

Reliability performance success

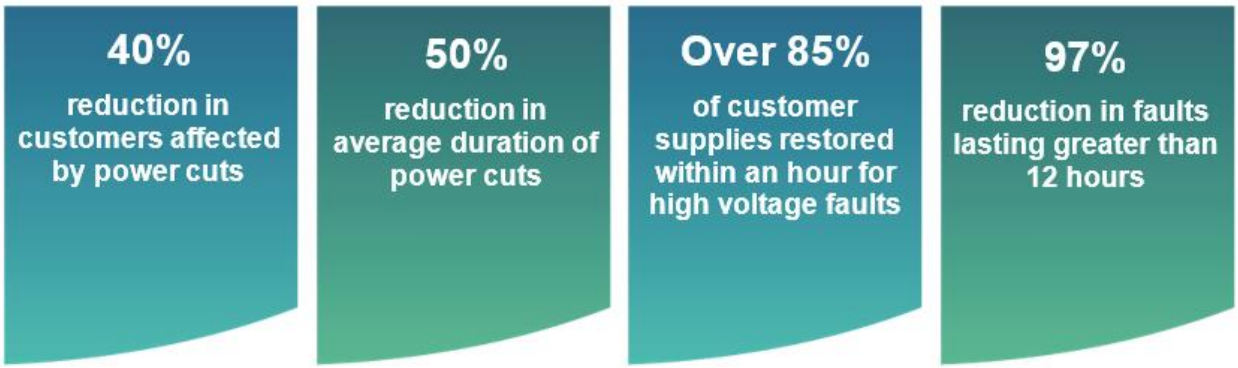

Figure 2.5 Highlights of our reliability performance during RIIO-ED1

Proven safety record

2.19 We view the safety of our staff, contractors and the general public as one of our highest priorities. We strive to achieve the very highest safety standards and to cultivate a strong safety culture:

Our safety performance RIIO-ED1

Figure 2.6 Highlights of our safety performance during RIIO-ED1

Proven reduction of our environmental impact

Reducing our business carbon footprint

2.20 We fully embrace the part we can play to reduce the impact on the environment. We have focused on reducing our business carbon footprint which is a measurement of the impact on the environment as a result of our work activities, in RIIO-ED1. We now regard it as an even higher priority going forwards.

Reducing our environmental impact

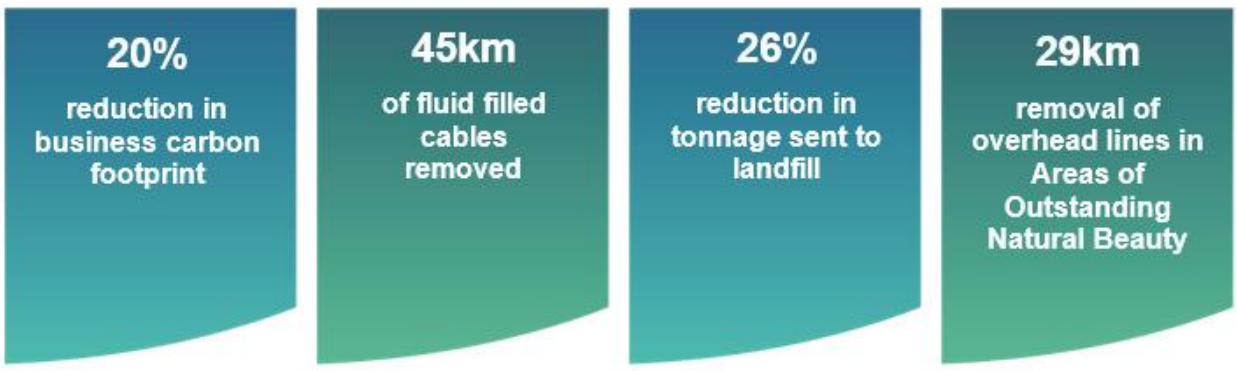

Figure 2.7 Areas where we have reduced our environmental impact

Enabling increased volumes of Low Carbon Technology connections

2.21 Over the course of RIIO-ED1, we have seen huge changes in the way that electricity is generated and consumed. As a result, the scope of our activities has developed beyond the commitments that we made in our RIIO-ED1 Business Plan.

2.22 We have undertaken work in RIIO-ED1 which supports our aim to achieve a decarbonised network for our customers in the future. By starting the work ahead of RIIO-ED2, we have already made improvements to our network which will support the achievement of net carbon emissions in the UK by 2050.

Establishing a Distribution System Operator (DSO) capability

2.23 We have seen significant changes in the way electricity is generated and consumed, largely as a result of the growth of distributed generation, electric vehicles, heat pumps and development of other emerging technologies.

2.24 We were the first DNO to react to these changes, developing our Distribution System Operator capabilities. These enable us to operate the network more flexibly, balance sources of supply and demand in real time and avoid the need for costly network reinforcement, where possible, by local management of generation output, load and power flows. We also created a DSO and Future Networks team, which operates separately from our existing operational teams.

2.25 In June 2019, we were the first DNO to publish a fully costed DSO transition plan. This outlined our strategy, implementation plans, costs and timescales for undertaking wider DSO activities. This plan is updated every six months.

Highlights of our DSO activities

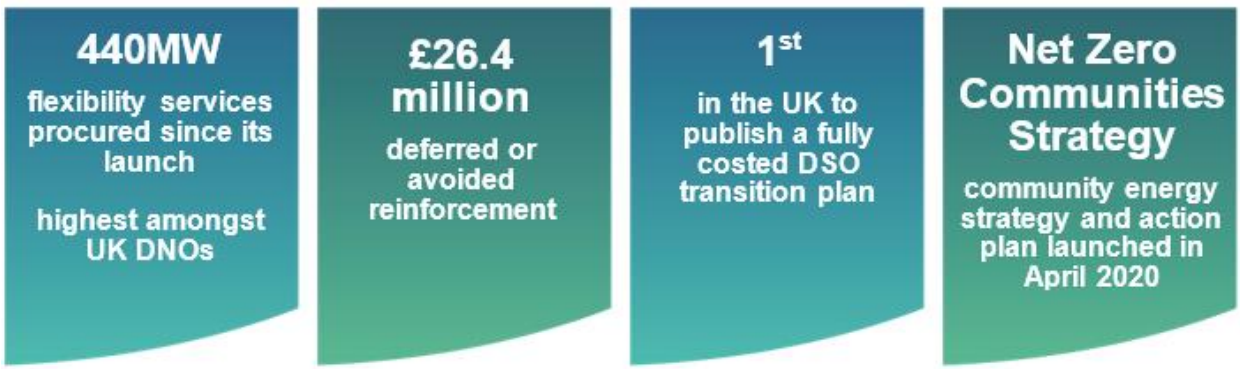

Figure 2.8 Highlights of our DSO activities impact.

Producing Distribution Future Energy Scenarios (DFES)

2.26 In 2015 we were the leading DNOs to publish a Distribution Future Energy Scenarios document, which forecasts the volumes and regional distribution of low carbon technology uptake in our region. This uses stakeholder-informed bottom up analysis to align with national top down industry-developed future energy scenarios. DFES are key to our continual assessment of the distribution network, helping us to highlight potential network constraints before they arise.

2.27 To enhance the quality of our DFES process further, our Distribution Managers work proactively with the local authorities in their areas to understand the authorities' strategic ambitions and delivery plans, allowing these to be factored into WPD's Best View of the future energy requirements.

Procuring flexible services

2.28 We implemented the first dynamic purchasing system for the procurement of demand side flexibility services. This system enables us to maintain a register of potential flexibility providers and directly engage with them when procuring demand side flexibility services, while remaining compliant with EU procurement law.

2.29 We were the earliest DNO to commit to a six monthly procurement cycle for flexibility services through our customer-facing flexibility service, known as 'Flexible Power. We have also implemented weekly processes for identifying short term flexibility need and use an electronic, automated dispatch platform. Our work in this area again makes us an industry leader.

Making our network data available to our stakeholders.

2.30 We recognise that digitalisation of the energy system is key to building a smart and efficient energy system and underpins our RIIO-ED2 strategy.

2.31 Digitalisation is the process of using digital technologies to make fundamental changes to the way the network is operated. Over the course of RIIO-ED1, we have gradually increased the amount of digital technologies on the network – from automation to monitoring equipment.

2.32 Key activities undertaken during RIIO-ED1 to support digitalisation in RIIO-ED2 include:

Key activities supporting Digitalisation
✓ Publishing a Digitalisation Commitment in December 2019
✓ Making data available via our Energy Data Hub on the WPD website
✓ Using a wide range of external data from developers, government and local authorities to produce future energy scenarios
✓ Investigating the potential to automatically detect homes with solar panels or electric cars using shared data from ElectraLink, the central body responsible for sending energy data around the whole industry
✓ Allowing communities and energy service providers to access consumption data securely from their local distribution substation as part of our Open LV innovation project
✓ Launching the Carbon Portal to provide accurate real-time historic and future CO2 content for the actual electricity being delivered to our customers' homes.

Figure 2.9 Key activities supporting digitalisation during RIIO-ED1

Supporting the green recovery and net zero

2.33 The UK's 2019 commitment to reduce greenhouse gas emissions by at least 100% by 2050 (compared to 1990 levels) has presented new challenges for us. We must ensure that the development of our network supports the achievement of the government's net zero targets.

2.34 To date, we have connected almost 10GW of distributed energy resources (such as distributed generators and storage) to the network. We have re-engineered our network, which was designed to supply 14GW of maximum demand, to accommodate up to 20GW of distributed energy resources.

2.35 We have committed to spend up to £90million in the last three years of RIIO-ED1 to support the green recovery. We will invest up to an additional £22m into our EHV network and £68m in our high voltage network to boost network capacity, allowing low carbon technologies to connect to our system and accelerate the green recovery.

Electric vehicles (EVs) and heat pumps

2.36 We recognise that the growing popularity of EVs and heat pumps has the potential to significantly alter daily load profiles and increase the amount of power used.

2.37 During RIIO-ED1, we were the first DNO to introduce an EV strategy. This describes our plans to support the development of an EV charging infrastructure, enabling EV drivers to charge their vehicles at a time and place to suit them. Our strategy was developed using learning gained from RIIO-ED1 innovation projects and designed to enable DNOs to identify the parts of their networks likely to be affected by plug-in–vehicle uptake and domestic charging.

2.38 We have also published a Heat Pump Strategy outlining our plans to support the expected rise in heat pump installations as part of the UK's transition to net zero.

Case study - Sharing the results of the industry leading Electric Nation Smart Charging trial

In July 2019, we held an event to share the results of our Electric Nation Smart Charging trial. We shared detailed data gathered from the trial and the conclusions reached, including the following:

- Customers can be flexible in the time of day they choose to charge their vehicles but, without incentives, the demand for evening charging requires management
- Remotely managing customer charging is technically feasible, as well as being acceptable to participants
- 'Time of use' incentives appear to be effective at moving demand away from the evening peak

Figure 2.10 Our Electric Nation case study

Supporting community energy

2.39 Community energy groups are expected to play an important part in achieving net zero, by enabling future networks to be smarter and more flexible.

2.40 During RIIO-ED1, we have carried out many activities including:

Key activities supporting Community Energy
✓ Undertaken a range of innovation projects focused on community energy projects from early stage Demand Side Response trials to large scale demonstration projects such as Open LV, providing distribution substation data in real-time to enable communities to understand their energy use and increase their flexibility
✓ Developed new sources of online information for community energy customers covering a range of topics from connections to flexibility markets
✓ Facilitated shared learning between community groups, including site visits
✓ Provided opportunities for stakeholders to discuss innovation project ideas and seek feedback

Figure 2.11 Key activities supporting community energy during RIIO-ED1

Our expenditure in RIIO-ED1

Total expenditure (Totex)

2.41 Our total expenditure includes capital investment in the network (e.g. building new network or replacing old assets) and operating costs for areas such as maintenance, fault repairs and training.

2.42 We believe in investing the money we receive from our customers effectively and efficiently to make our network more reliable and to ensure it has the capacity to meet future connection requirements.

2.43 In the first two years of RIIO-ED1 we spent more than our allowances to get ahead in our work programmes and deliver benefits for customers. Expenditure has progressively been brought in line and at the close of 2019/20, our expenditure was 2% below our Totex allowances for RIIO-ED1 to date as shown in the table below. While the COVID-19 pandemic and the restrictions it imposed on our work will impact on what we are able to deliver in 2020/21, we forecast that the majority of this work will still be completed by the end of RIIO-ED1, particularly as we seek to deliver increasing levels of reinforcement to aid the green recovery.

	2015/16 Actual	2016/17 Actual	2017/18 Actual	2018/19 Actual	2019/20 Forecast	2020/21 Forecast	2021/22 Forecast	2022/23 Forecast	RIIO-ED1 Total
Totex £m	1,120	1,169	1,007	935	962	978	1,095	1,099	**8,366**
Allowance £m	1,094	1,090	1,029	1,055	1,039	1,031	1,052	1,058	**8,447**
Variance £m	26	79	-21	-119	-77	-53	43	42	**-81**
Cumulative variance £m	26	105	84	-36	-113	-166	-123	-81	
Cumulative variance %	2%	5%	3%	-1%	-2%	-3%	-2%	-1%	

Figure 2.12 Our Totex performance during RIIO-ED1

2.44 We have continued to ensure we deliver on the commitments in our RIIO-ED1 investment plan, as well as making service enhancements above and beyond our original commitments. The costs of these service enhancements have been offset by efficiencies throughout the period, which means we remain on track to deliver within our RIIO-ED1 allowances by the end of the price control period.

Proven efficient cost of delivery

2.45 As the only fast tracked DNO in RIIO-ED1, we have a proven reputation for efficient delivery. From the outset of RIIO-ED1, we have focused on delivering the Business Plan outputs agreed with our stakeholders in the most efficient way possible.

2.46 Our approach demonstrates our commitment to providing a value for money service without compromising the high standards to which we hold ourselves and which our customers have come to expect. We believe efficiency is about much more than the cost of delivery and will continue to emphasise the importance of customer benefits in our decision-making processes.

2.47 We continue to embed efficiency improvements introduced at the start of RIIO-ED1 and to see the impact of these in the second part of the current price control period.

2.48 Initiatives employed to improve efficiency in RIIO-ED1 include:

Key activities supporting Efficient Cost of Delivery
✓ Introducing an electronic resource programme boards(STARS) to improve efficiency for out staff
✓ Installing driver behaviour systems in all of our vehicles which monitor and communicate with drivers to improve driving performance and therefore improve fuel efficiency and safety
✓ Use of Light Detection and Ranging (LiDAR) equipment to survey our overhead lines for infringement by trees; this allows targeted tree cutting at the optimum time to prevent the trees' growth affecting our network.
✓ Use of Kelvatek fault location equipment to improve fault response times
✓ Installation of automatic switching points on the network which negates the need to go to site to operate on the network and improve restoration times
✓ Voltage reduction across the network following an innovation project recommendation which has reduced technical losses
✓ Development of IPad applications to provide ease of access to information/functionality and easy access to critical information helps to get the job done more effectively

Figure 2.13 Key activities supporting efficient cost of delivery during RIIO-ED1

Customer bills in RIIO-ED1

2.49 Our aim is always to deliver an excellent and affordable service to our customers. In RIIO-ED1, we will not only deliver our outputs and continue to invest in the network to improve our services but will go beyond these commitments. Our efficient approach to operating the business has enabled us to do a lot more than we planned, while still keeping customers' bills at a consistent level throughout RIIO-ED1. Overall our domestic customers pay £96 per annum for us to provide the level of service that we do today.

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Chapter 3

Giving customers a stronger voice

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3. Giving customers a stronger voice

Summary

3.1 In this chapter we demonstrate that we have undergone the most comprehensive and inclusive stakeholder engagement programme ever to arrive at the proposed commitments we will deliver for stakeholders in RIIO-ED2. More than 4,500 stakeholders have already had their say and our engagement processes will continue throughout 2021 right up to the submission of WPD's final Business Plan in December 2021. Our stakeholder engagement has included our broadest ever range of stakeholders, including perspectives from bill paying customers and future customers.

3.2 We have followed an ambitious process to co-create and negotiate our Business Plan with stakeholders, to ensure that it meets the different, wide ranging needs and expectations of the customers and communities we serve. We have sought to collaborate with stakeholders at every stage to develop the specific commitments and targets we must deliver and ensure our plans address stakeholder priorities.

3.3 As part of our engagement approach we host annual workshops to set our strategy and priorities, as well as conducting research, surveys, conferences and bilateral meetings. This enables us to identify new and emerging priorities, reflecting shifts in wider society and stakeholder expectations.

3.4 Every core commitment in this draft Business Plan is in response to an area of focus identified as a priority by stakeholders. Our ongoing consultation will determine whether they consider these first proposals to adequately address their priorities. Where this is the case, we will collaborate with stakeholders to set the precise scale of ambition and delivery targets for each commitment. Where our proposals fall short, we are asking stakeholders to suggested additional or alternative commitments.

The environment we expect to operate in

3.5 This is an exciting time for the future of energy in the UK. WPD's Business Plan sets out an ambitious programme of work to drive key changes, including the decarbonisation of transport, the widespread adoption of energy flexibility services and support for the ambitious, bespoke energy plans in the local communities we serve.

3.6 As a result of our longstanding approach to stakeholder engagement, we have built a strong understanding of the needs of our stakeholders. In addition, there are key environmental and regulatory obligations and government policy decisions that we must deliver. For example, WPD has a fundamental responsibility to help to drive the government's target for net zero carbon emissions by 2050.

3.7 When we began the process of planning for RIIO-ED2, there were a number of key focus areas we expected to see in our Business Plan. These included the shift to build and operate a smarter, more flexible energy network and the need to facilitate the connection of increasing volumes of electric vehicles and other low carbon technologies, were all highly likely to feature. Our decades of expertise running the electricity network allows us to use our considerable knowledge to anticipate some of the needs of our customers. However, we are careful never to assume what our customers expect from us, which is why we place such a high importance on engaging regularly with our stakeholders.

3.8 In a number of areas, stakeholders may want us to build on our track record of delivery and achieve incremental improvement, but in others they may want to propose entirely new ways of operating. That is why it is vital that we ask open, non-leading questions to understand stakeholder requirements. Customers pay for everything we do, so they have a right to influence every aspect of our delivery.

3.9 In 2018, before starting our RIIO-ED2 engagement programme, we asked stakeholders to start with a 'blank sheet of paper' to tell us the high-level outcomes they wanted WPD to achieve for customers in our next Business Plan. We sought to provide only essential context and information on our current baseline performance.

3.10 Since then we have built our Business Plan in stages – collaborating with stakeholders throughout, in a process of 'co-creation'. The decision to start from a blank sheet of paper was an intentional strategy to:

- Update our understanding of stakeholder priorities
- Identify significant changes in expectations
- Invite suggestions for ways to improve, change or evolve our operations.

Highlights of our stakeholder engagement

Figure 3.1 Highlights of our engagement with stakeholders

Our overarching approach to stakeholder engagement

3.11 Frequent, challenging and high quality engagement with stakeholders is crucial to the success of any organisation and is the core foundation on which our Business Plan for RIIO-ED2 is built. We set ourselves a number of challenges when developing the approach to stakeholder engagement in RIIO-ED2, which involved answering the following questions.

- Are we speaking to the full spectrum of people impacted by our operations now and in the future?
- Are we avoiding asking leading questions at all times - instead handing over decision-making power to stakeholders themselves and allowing them to start with a blank sheet of paper?
- Most importantly, are we turning these conversations into meaningful and measurable actions to improve the lives of the people who rely on us every day, and to allow stakeholders to track the results of their feedback?

3.12 Our overarching goal for engagement for RIIO-ED2 is to deliver the most extensive programme possible. We sought to deliver the highest quality engagement, identify our broadest stakeholder audience ever (including new and emerging groups) and engage using a range of techniques specifically tailored to our stakeholders' diverse and bespoke needs.

3.13 We adopt the widest possible definition of the term 'stakeholder', which means we strive to engage with anyone who has an interest in, or is impacted by, our operations. This can present its own challenges as each group brings a unique perspective and set of priorities. The key to overcoming this has been to work closely with our stakeholders, balancing the various considerations and reaching a consensus that works for everyone, wherever possible. After all, their views reflect the diversity of our 7.9 million customers, who pay for the work we do and, therefore, have a right to influence our service. The types of stakeholder we serve are summarised in this table:

Figure 3.2 Stakeholder engagement event

National policy	Government departments; Industry bodies; Energy Networks Association; MPs and Welsh Assembly Members; Media; Trade press
Local energy influencers/partners	Local government; Mayors and combined authorities; LEPs; Community energy groups; Highways agencies; Universities and research institutes
Customers	Domestic; Business; Future; Fuel poor / vulnerable; Vulnerable customer representatives; Charities; Consumer interest bodies; Healthcare; Emergency services; Parish Councils; Distributed generation; Storage/renewables providers and installers; Energy aggregators; Flexibility service providers; Developers; Major connections customers; Energy consultants; Connections providers; IDNOs; NGOs; Trade associations; Environmental groups; Academic institutions; Major energy users; EV charge point manufacturers and installers
Industry, workforce and supply chain	Suppliers; Transmission companies; Gas Distribution Networks; Innovation project partners; WPD workforce; Supply chain and contractors; Shareholders; Investors; Trade unions

Figure 3.3 Types of stakeholders

3.14 We have a comprehensive stakeholder engagement strategy It has undergone extensive external scrutiny - including benchmarking across a wide range of sectors - to ensure it is as effective and innovative as possible (as part of assessments via the British Standards Institute and Customer Service Excellence Standard).

3.15 Ultimately, we have co-created the Business Plan with stakeholders using an iterative process. This means it has been built up in stages, starting with a blank sheet of paper and regular interaction with stakeholders to play back what we have heard. Using this process, we have, shared our proposed actions at an early stage, addressed any feedback and continually refined and added detail to our commitments. This has resulted in the most scrutinised, well justified, stakeholder-endorsed plan we have ever produced. To achieve, this our approach has been guided by six key principles:

- **Inclusive**: Our plans take into account all stakeholders, including the hard-to-reach and seldom heard voices. We have explicitly targeted and represented these within the testing sample of the various 'end user' surveys, research sessions and workshops we have undertaken. This is to ensure that we build our Business Plan with a broad, representative range of stakeholders. We have identified new, emerging and increasingly local stakeholder groups, as well as changes in the needs of existing stakeholders. For example, in recent years we have seen the emergence of storage operators, flexibility service providers, energy aggregators and electric vehicle charge point operators. At the same time, there have been significant shifts in the requirements, responsibilities and interests of existing stakeholders such as local authorities, community energy groups, fuel poverty charities and vulnerable customer support services in light of the move to a low carbon future and the pursuit of net zero carbon emissions targets. Using a targeted, tailored engagement approach, we have developed insight that is representative of our entire community and worked with them to co-create a Business Plan to match.

- **Transparent**: This means publishing all feedback we have received and the actions that resulted. We have not only shared the findings from each individual engagement activity, but have also produced a standalone synthesis report after each key engagement stage (see below for an overview of our five core engagement stages). These were produced by an independent, third party to combine the feedback received objectively and to present the key, overarching findings in a single, comprehensive report. This reassures stakeholders that no views have been omitted or ignored and shows how consolidated stakeholder feedback has led to action in our Business Plan. As a result, stakeholders do not need to review multiple engagement activities and reports.

- **Proactive**: We identify and reach out to stakeholders; they do not need to seek us out – however we welcome all views and will not exclude any group. We have built trust by ensuring engagements include the full spectrum of stakeholders and have demonstrated an enduring commitment to acting on their feedback and using feedback to influence short and long term planning, extending beyond the five year RIIO-ED2 period. We have sought to act in a fair, socially responsible way at all times, engaging early on key issues and ensuring a proactive response to challenging issues.

- **Tailored**: We use a wide variety of engagement methods to suit the audience, avoiding a 'one-size-fits-all' approach. For this Business Plan, we've engaged with our largest ever number of stakeholders. This means a much wider variety of representatives who all have their own very different knowledge of, interest in and direct experience of, WPD and the energy sector. In response, we must broaden the range of techniques and mechanisms we use to engage, drawing on best practice. The methods we select must suit the type of stakeholder we are engaging, not what is convenient for us. When tailoring our programme, we aim to include stakeholders from all levels in our business planning processes, and to avoid giving disproportionate attention to those who are 'louder' or better resourced to engage than others. This includes reaching out to hard-to-reach consumers who may not have participated in engagements before and ensuring a representative sample of these types of stakeholders are included in our feedback.

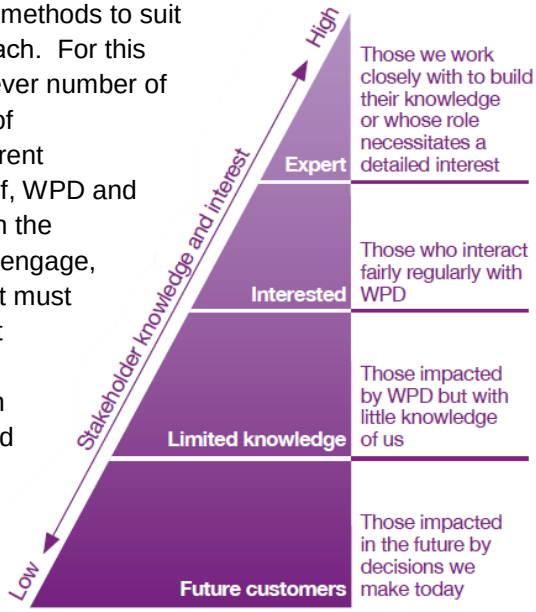

Figure 3.4 Knowledge and interest levels of our stakeholders

- **Purposeful**: Engagement needs to lead to action. The intention of every engagement is to learn, improve and involve stakeholders in the co-creation of our plans. We seek to engage as widely and inclusively as possible, using methods that encourage discussion and meaningful engagement. We avoid short survey responses and other information-gathering that makes it difficult for stakeholders to offer detailed responses. Our focus is always on meaningful, two-way engagement that hands decision-making power to stakeholders and directly shapes our actions.

- **Expert-led**: Our engagement programme is headed up by those best suited to the job, with appropriate expertise, experience and responsibility for acting on insight. Stakeholders tell us they value the fact that the WPD staff responsible for acting on their feedback are also the ones who participate in the delivery of the engagement.

3.16 The successful application of this approach has led to a richer, more comprehensive understanding of stakeholder requirements than ever before. In turn, this has led to an ambitious, wide-ranging Business Plan that delivers real value and innovative change for customers, by addressing the priorities, expectations and evolving needs of our stakeholders.

3.17 Stakeholder engagement is an enduring exercise at WPD. It underpins our decision-making processes across every strand of our business. We therefore focus on building long-term relationships with stakeholders, who frequently return to engage with us because they recognise the value we place on their feedback. To continue this success, it is vital we continue to challenge ourselves to develop our approach further, learn from best practice, and seek to deliver our most pervasive and stakeholder-led programme of engagement ever. Everything we do is driven by our engagement with stakeholders to co-create a Plan that is fit for all our futures.

Key context: Identifying the landscape in which we expect to operate

3.18 Key changes in our operating landscape include:

- **Our vital role delivering 'Net Zero':** Low Carbon Technologies are already changing energy flows across the distribution network, in particular on the low voltage network. On top of this, demand for electricity is expected to rise significantly. These huge increases are largely a result of increased local generation, and the growing use of electricity for transport and heating.

As a Distribution Network Operator with a Distribution System Operations function, we have a fundamental responsibility to help deliver – and not just facilitate - the government's 2050 net zero target. Stakeholders don't want us to be passive; instead, they believe we should be a key driver and innovator of the changes needed. That means we must actively encourage the connection of 'clean' local generation, proactively enable electric vehicle uptake and develop new ways of utilising existing capacity through extensive flexibility services, avoiding the need to build bigger networks.

- **Localism and supporting the bespoke energy plans of individual communities:** Net zero is a national target but will be delivered regionally. In WPD's area, almost 80% of the local authorities have declared climate emergencies, setting targets well in advance of 2050. It will take a co-working approach between WPD and a wide range of stakeholders to achieve an effective, decentralised energy system to deliver these ambitious targets. Change is happening at different pace across sectors and regions. For example, Lincolnshire (which has significant coastline with offshore wind) is planning to connect high volumes of distributed generation to our system, while urban areas like Nottingham and Bristol, which have set ambitious decarbonisation goals of 2028 and 2030 respectively, are pursuing huge increases in electric vehicles to decarbonise transport, alongside other key measures. That's why our engagement strategy could never follow a 'one-size-fits-all' approach. Instead, we must adapt our strategy to meet the differing requirements of our stakeholders and to tackle the very individual and complex issues facing each region. This calls for increasingly localised engagement. We must engage with local stakeholders to understand their existing energy plans, which can then be fed into our future energy scenarios. Equally, we will provide stakeholders with details of our modelling to help inform the creation and updating of their local energy plans.

- **Delivering an 'open data' future:** To deliver net zero, we not only need to change the way energy is used and delivered; we also need to ensure that the data that underpins this change is effectively utilised. Stakeholders are already asking for access to more and better quality data to help plan their own energy initiatives.

Data will be vital to show how and when electricity is being used and to avoid disruption to the network, as changing electricity habits make demand much less predictable in the future. Factors such as 'clustering', where several electric vehicles are charging in the same street, and contrasting behaviour, such as where one consumer charges while another discharges, will drive significantly different flows on low voltage (LV) networks. Where the LV network becomes stressed and complicated, more detailed analysis is required – and that's where access to data is vital. Without data, the increased usage of electricity and changes in customer behaviour could cause massive disruption to the distribution network system. Data will be required to inform key network management decisions on investment or the development of Distribution System Operator services, such as demand side response, flexible additional generation or flexible demand/access arrangements. Stakeholders expect us to adopt an open data policy, sharing all data unless restricted by privacy, security or commercial confidentiality reasons. We will then work alongside partner agencies to unlock value from this data and use it to trigger new, innovative services.

How stakeholders have co-created our Business Plan

3.19 We understand the need to pursue a highly ambitious stakeholder engagement programme if we are to create an equally ambitious Business Plan. We are proud of the quality, range and impact of our programme which is inspired by our aim to be an industry leader and to deliver the best performance in the UK. To deliver the most effective and meaningful engagement possible, we use every opportunity to build proactive relationships with stakeholders, organising face-to-face, enduring engagement wherever possible. This enables us to explore issues in greater detail and results in well-informed, granular feedback, helping us to drive maximum improvement and explore innovative and ambitious ways of improving our service. Where face-to-face sessions are not possible, such as during the Covid-19 pandemic, we have successfully adapted our approach to include interactive, facilitated online engagement, video conferencing, webinars, online focus groups and research surveys. During the pandemic, we continued to engage as widely and inclusively as possible, maintaining similar volumes of stakeholder engagement despite the change in circumstances, enabling us to stimulate and act on meaningful feedback in the same way as before.

Figure 3.5 Stakeholder event to identify suggested actions for RIIO-ED2

3.20 From the beginning, the aim of our engagement has been to give customers a strong voice in our planning process. To do this, we have organised bespoke co-creation engagement events to enable stakeholders to influence and shape our decisions in the most pervasive, bottom-up way possible. We've challenged ourselves to go further, asking stakeholders not simply to influence, change or refine our plans but to take part in collaborative engagement. This means stakeholders have been asked to start from a blank page and work alongside our staff to co-create our plans.

3.21 When the Customer Engagement Group (CEG) asked how we planned to achieve an engagement programme to address the needs of a broad cross-section of stakeholders, we commissioned an independent review of best practice approaches to engagement. The review covered a wide variety of sectors including water, gas and rail and revealed a broad range of engagement activities by these companies.

3.22 Our engagement approach during the RIIO-ED1 process (for which our plan was accepted first time by the regulator in a process known as being 'fast-tracked') involved stakeholders heavily in decision-making. But we wanted to go further during the RIIO-ED2 process by working with stakeholders to co-create plans from scratch, giving stakeholders free rein to go beyond the areas covered in previous stakeholder engagement. As a result, we have invited external scrutiny and challenge from the CEG as well as WPD's expert Customer

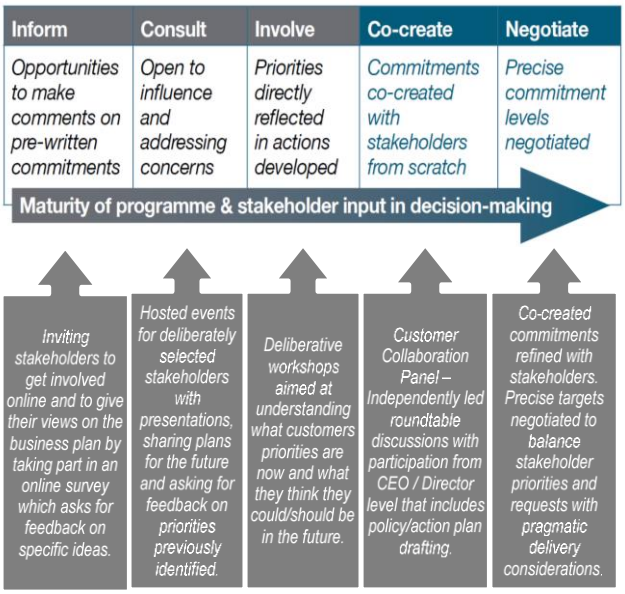

Figure 3.6 Levels of engagement maturity

Collaboration Panel, to ensure all our foundation stage engagement truly began from a ‘blank sheet of paper’ and used neutral, non-leading language.

3.23 We have asked stakeholders first to devise our overall priorities, before building these up to specific commitments and finally adding measurable performance targets - all from scratch. By doing this, we will deliver the best outcomes possible for customers, thanks to a Business Plan that reflects their needs and will adapt to their changing priorities over time.

Co-creation in action: Stakeholders’ high-level priorities for the future

3.24 In 2018, before starting our RIIO-ED2 engagement programme, we asked stakeholders to tell us the high-level outcomes they wanted us to achieve for customers in our next Business Plan. While the specific service expectations differed among stakeholder groups, they all agreed on eight core priorities that must underpin WPD’s Business Plan:

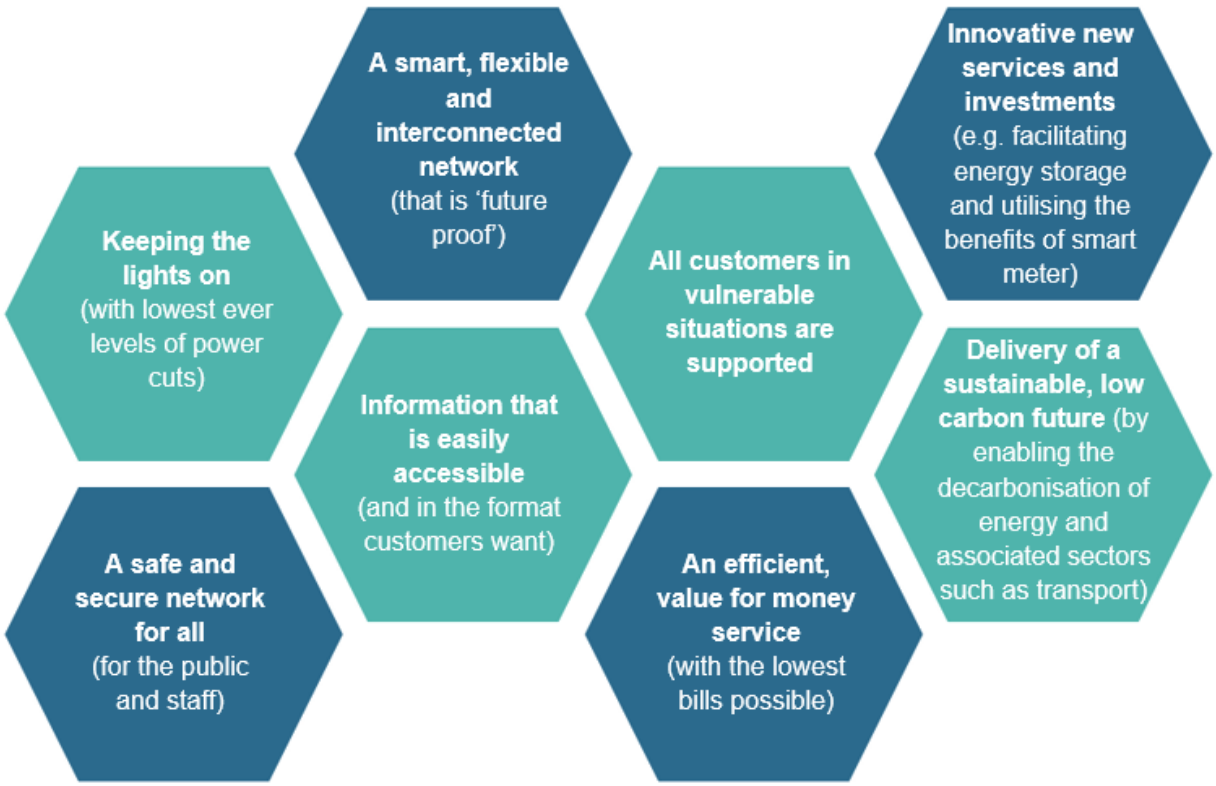

Figure 3.7 Stakeholder high-level priorities

Co-creation in action: over 1000 initial actions suggested by stakeholders

3.25 As set out in the sections below, we have engaged over 4,500 stakeholders at around 50 engagement events to date. While some of these were more informative - particularly where we were looking to reach out to all 7.9 million customers - most have been designed to encourage discussion. Sessions like these help us to define issues, develop proposals, resolve areas of conflicting feedback and identify preferred solutions. For example, in February and March 2020, we held specially designed, Business Plan commitment co-creation events at six locations (rural and urban) across all four of WPD's licence areas. This was our largest series of events ever with 393 stakeholders attending in person.

3.26 The objective of the six sessions was for stakeholders to start from scratch to identify our Business Plan commitments. They were briefed on some of the factors to be considered by our managers responsible for each topic area before taking part in roundtable 'co-creation surgeries'. In this way, we have again shown our commitment to industry-leading practice which goes beyond simply consulting on our proposed plans.

3.27 Stakeholders were asked to:

- Identify the high-level topics they wanted us to address, then;
- Identify specific focus areas within each topic, then;
- Begin to draft the commitments for each focus area – and what they would like us to deliver to achieve these.

3.28 Each table began with a different topic. Facilitators then swapped topics, enabling stakeholders to review, amend and add to the suggestions of others. This helped to refine the proposals as part of the creation process, as well as ensuring weighted feedback so the views of individuals were not allowed to feature too heavily. Each session closed with electronic voting to gain a quantitative view on the importance of the topics discussed. These findings were updated live on the day to incorporate the priorities and commitments co-created by stakeholders during the roundtable discussions.

In total, stakeholders identified 14 key topics, over 300 focus areas and over 1,000 initial suggestions – all in the stakeholders' own words

3.29 Many of the items raised by stakeholders as part of this process have been included in our Business Plan commitments. Where suggestions were not carried forward in the exact terms requested, this was due to the following:

- We are already fulfilling the commitment. It is therefore considered to be part of our 'business-as-usual' activities and will continue.
- The suggestion was based on a misinterpretation of our role and responsibilities.
- There was lack of awareness of our regulatory context.
- Suggestions were not supported sufficiently by wider stakeholders when tested and triangulated as part of our ongoing engagement process.

3.30 To give an indication of the scale and value of our co-creation process, the table below gives an example in each topic category of the types of issues raised by stakeholders for us to address:

Topic	Focus areas	Suggested actions
1. Network reliability	**37 aspects** to consider. e.g.	**161** e.g.
	• Overall health of network assets • Use flexibility and local generation to address demand needs	*"Create accurate forecasting models and ensure that assets can respond to future (higher) demand"*
2. Network resilience	**30 aspects** to consider. e.g.	**80** e.g.
	• Scenario planning / data analysis • Flood protection	*"Use long-term climate scenarios (1:100 years is no longer fit for purpose) and work with a range of stakeholders to mitigate flood risk"*
3. Cyber resilience	**15 aspects** to consider. e.g.	**60** e.g.
	• Network security – risk of power cuts due to a cyber attack • Systems security – risk of data loss / access	*"Commit to external security testing and seek accreditations from third parties"*
4. Whole systems approach to net zero	**41 aspects** to consider. e.g.	**144** e.g.
	• Help local communities to achieve their net zero carbon emissions targets • Facilitate / incentivise local low-carbon generation and storage	*"Engage with local authorities to support them to deliver on their net zero targets, sharing knowledge and information"*
5. Innovation and new services	**43 aspects** to consider. e.g.	**114** e.g.
	• Support community energy projects to connect to the network • Collaborate within the industry to offer tariffs to encourage flexibility	*"Educate and inform communities about the benefits of community energy, using workshops and forums"*
6. Environment	**37 aspects** to consider. e.g.	**121** e.g.
	• Reduce harmful leaks from our equipment • WPD to be net zero before 2050	*Having a more ambitious net zero target than the government's target of 2050"*
7. Electric vehicles	**34 aspects** to consider. e.g.	**158** e.g.
	• Facilitate electric vehicles on a mass scale • Lobby for national EV strategy ensuring standardisation	***"**Work with the government and Ofgem to deliver a clear, coordinated EV strategy"*
8. Vulnerability	**23 aspects** to consider. e.g.	**120** e.g.
	• Protect the interests of vulnerable customers in the switch to a smarter network • Communication / collaboration with others to raise the profile of WPD's services	*"Work cross-agency to publicise and deliver vulnerability services"*
9. Fuel poverty	**14 aspects** to consider. e.g.	**50** e.g.
	• Partnerships and outreach services • Identifying fuel poverty	*"Work closely with key stakeholders and partners to provide education and support for customers in fuel poverty"*

Topic	Focus areas	Suggested actions
10. Safety and health	**13 aspects** to consider. e.g.	**22 e**.g.
	• Maintaining a safe, healthy and motivated workforce • The potential post-Brexit legislative changes to health and safety law	*"Ensure the mental health needs of the workforce are being met and supported by promoting a healthy work-life balance"*
11. Connections	**30 aspects** to consider. e.g.	**60** e.g.
	• Low-carbon technologies (including EVs) • Investment in local development plans	*"Invest ahead of need and undertake forecasting for EV connections to ensure sufficient capacity, e.g. new apartment blocks"*
12. Workforce resilience	**8 aspects** to consider. e.g.	**59** e.g.
	• Retention and upskilling of a specialised, highly skilled workforce • Improving the diversity of our workforce	***"****Develop a diversity strategy that is long-term and reflects wider demographic changes"*
13. Customer service	This topic was considered by stakeholders to be a 'golden thread' that must run through all our Business Plan commitments. It was therefore tested as an explicit aspect of each of the topics listed above, rather than as a standalone topic. In addition key standout considerations emerged as: • Customer satisfaction • Quality of communication/information	
14. Affordability	Stakeholders requested that the plan must be affordable and represent value for money. This therefore led to standalone social value testing and quantitative testing.	

Figure 3.8 Topics co-created by stakeholders

The role of the Customer Engagement Group

3.31 At every stage of our business planning and decision-making process for RIIO-ED2 has been scrutinised by an independent, challenge body called the Customer Engagement Group (CEG). The CEG reflects the needs and preferences of existing and future consumers and promotes good value customer outcomes, with a focus on affordability, the protection of vulnerable consumers, the environment, sustainability and the transition to a low carbon energy system.

3.32 We followed a robust, independent and transparent process to appoint all members. As part of this, we sought ratification and approval to proceed from Ofgem (Head of RIIO2 Policy on Engagement, Head of RIIO2 Policy and Deputy Director of ED and Cross Sector Policy) on five occasions, including direct oversight of, and input into, the Chair interview shortlisting process.

Chair recruitment

3.33 We appointed an external recruitment agency with expertise in CEO and Non-Executive Director recruitment, resulting in a long-list of over 40 Chair candidates. We then engaged an independent expert with first-hand experience of holding an equivalent role in the water sector (Chair of Welsh Water's Customer Challenge Group for PR19) to conduct a stand-alone, parallel evaluation of candidates, alongside our own assessment. All candidates were formally assessed against role criteria and a weighted skills matrix that was agreed in advance with Ofgem.

Member recruitment

3.34 Our wider stakeholders wanted CEG members to be drawn from across a range of areas of expertise. In 2018, we ran consultation workshops to identify 24 areas of expertise that must be covered by the group and assessed all candidates using a detailed matrix-based approach. Both WPD and the Chair were determined that the CEG should cover all the areas of knowledge and expertise outlined by stakeholders. We therefore made it a requirement that each candidate must have expert knowledge in multiple areas. Working with the Chair, we developed a thorough 'terms of reference' document for the group, to help with recruitment. This made it clear to candidates that the CEG was more than a consumer interest group, and spanned a diverse range of knowledge areas. The CEG includes experts in everything from low carbon technologies, future energy scenarios and energy system transition, through to major users, vulnerable customers and the representation of local/regional interests.

Figure 3.9 Our Customer Engagement Group members

WPD was the first DNO to establish a CEG, appointing its Chair, Duncan McCombie (CEO of YES Energy Solutions CIC, a fuel poverty company) in October 2018, followed by an independent secretariat and 14 members in February 2019.

3.35 It was also vital to identify senior, high-calibre individuals, who could relate to the needs of the consumers they were there to represent - as well as having a firm understanding of Ofgem's requirements and the RIIO price control process as a whole.

3.36 An initial long-list of 46 member candidates was drawn up, following an advertising and external recruitment campaign, led by an independent recruitment agency, as well as help from the Chair's network of contacts. The Chair then interviewed a shortlist of 23 candidates.

3.37 A key objective was to build a CEG with knowledgeable members who each represent more than one key expertise area. This will allow a diversity of thought within the panel, and enable members to challenge each other in order to provide the most holistic scrutiny of WPD as possible. The extensive expertise brought by the final 16-strong CEG (when including the Chair and Secretariat) is shown in the following table.

CEG knowledge & expertise matrix		Number of individuals with expertise in these areas
Customers	Customer research / representation	7
	Stakeholder engagement	10
	Major users	3
	Needs of current and future customers	4
	Vulnerable customers	5
	Fuel poverty	4
	Regional outlook / local issues	6
	Local Government or LEPs	3
Future energy systems	Energy system transition (DSO)	8
	Innovation	7
	Future energy scenarios	7
	Low carbon technologies e.g. EVs	6
	Distributed Generation	8
	Energy storage	5
	Community Energy and non-traditional business models	6
	Sustainability	7
Traditional energy systems	Energy supply	3
	Wider utilities sector (gas / water)	8
	Electricity transmission	4
	Electricity distribution (technical understanding)	6
	Environment (incl. decarbonisation)	6
	Resilience	5
	Regulatory framework / price control planning	10
	Outputs and expenditure	6

Figure 3.10 CEG members knowledge and expertise

3.38 The CEG meets as a full group at least every two months. In addition, seven sub-groups have been formed to provide rigour and challenge to our staff responsible for generating the Business Plan in the following areas:

Subgroup	Business Area	
Business Plan development	• Business Plan governance • Business Plan development • WPD's vision & BP success criteria	• Incentives/uncertainty mechanisms • Competition • Business carbon footprint / Environment
Innovation and Competition	• Digitalisation strategy • Modernising energy data • Electric vehicles/Heat pumps	• DSO • Innovation
Regional Drivers / Net Zero	• Future energy scenarios • Community energy	• Innovation • Decarbonisation & losses
Research	• Stakeholder engagement	• Willingness to pay
Customer	• Willingness to pay • Customer vulnerability strategy	• Social contract • Customer value proposition
Asset Management	• Cyber resilience & business IT security • Asset management	• Cost efficiency • Safety & network resilience
Workforce Resilience	• Workforce resilience • Diversity	• Operational training

Figure 3.11 CEG sub groups

So far in total over 50 individual meetings and 24 challenges have taken place.

Scrutinising and informing WPD's engagement approach

3.39 The CEG, and in particular the research sub-group, has provided expert challenge to our engagement process. From the outset, the group reviewed WPD's overall engagement strategy and proposed approach for engagement during RIIO-ED2. Its feedback and scrutiny has directly influenced and improved our programme in a number of ways, as shown below:

CEG scrutiny	WPD response
What factors will inform WPD's approach to consulting with stakeholders at the 'preliminary stage' of the Business Plan process? How will WPD ensure adequate representation of end users (with little prior knowledge of WPD) and future customers within its planning?	• Listed seven 'considered factors' WPD took into account before planning stage one of its preliminary/foundation engagement. • Commissioned an independent review of best practice consultative approaches for preliminary / foundation stage engagement. This review covered a wide range of sectors including water, gas and rail. • As a result, WPD significantly expanded the scope of its proposed preliminary engagement activities, from four initially planned methods to 16 core activities, spanning the full range of stakeholder knowledge levels from future customers through to expert stakeholders.
How will WPD ensure stakeholders are able to influence WPD Business Plan from scratch and not have their ambitions constrained to current roles, responsibilities and services?	• Set out proposals to ensure events always delivered opportunities for 'co-creation' wherever possible, including the use of non-leading language and providing sufficient context to enable stakeholders to have an informed debate and understand the landscape in which we expect to operate, without limiting ambitions to the current status quo.
How will WPD ensure attendees are mindful of the spectrum of	• Used multiple engagement mechanisms, tailored to each audience, to ensure we could access the broadest group of hard-to-reach

customers WPD serve, including those financially challenged (but not technically 'vulnerable') when assessing the costs and services?	customers as possible, including bespoke events for vulnerable and fuel poor consumers. • That every major research and focus group event included a balanced representative sample of our communities, including considering a range of geographies, ages, demographics and socio-economic levels.
How will WPD ensure that social value research (SVR) is robust ensures participants can comprehend the content to enhance the accuracy of the feedback they are able to provide?	• The SVR exercise was expanded to include a broader range of participant attributes to enable results to be broken down by different segments e.g. geographic, socio-economic, age and both household and non-household (business) customers. • Refinements and testing at design, pilot and fieldwork stages ensured that actions tested and the survey script were redrafted and adjusted to make it easier for participants to understand, by providing clearer questions and supporting information using less jargon and technical language. • Inclusion of additional explanatory information, helped to further improve the understanding of all participants, enhancing the accuracy of the findings • Information specifically tailored to business customers, ensured they understood why they were seeing initiatives which would impact households to ensure robust feedback and accurate data
How will WPD demonstrate that a 'golden thread' has been maintained throughout the Business Plan engagement, demonstrating clear correlation of stakeholder feedback to the content of the WPD Business Plan as well as ensuring consistency and a robust decision process for elements included, excluded or enhanced?	• A 'golden thread' mapping exercise ensured a clear line of sight was maintained throughout the entire plan, demonstrating that all outputs have been co-created with stakeholders with direct correlation to their feedback. In rare instances where this isn't the case, WPD will clearly set out if it is a compulsory regulatory requirement. • The CEG audited the 'golden thread' for the entire WPD Business Plan providing wider stakeholders and Ofgem the assurance that WPD has accounted for all major stakeholder engagement feedback, have not overlooked any key items of feedback even if challenging to address and all WPD's outputs have a clear stakeholder or regulatory driver (i.e. none are a WPD self-creation).
How will WPD ensure that it seeks and includes insight from future customers into their plans?	• A specific deliberative research exercise targeting future customers established a cohort of future customers able to provide feedback on WPD business planning priorities and commitments on an ongoing basis. • Tailored information and approach ensured these customers were able to self-educate and build knowledge across a number of weeks to ensure that feedback provided was informed and accurate.
How will WPD ensure that there is robust engagement so that the WPD Business Plan is fully reflective of local energy requirements and across RIIO-ED2?	• An exercise was undertaken to engage every local authority within WPD's regions on their individual planning requirements and to share information on WPD's Future Energy Scenarios (DFES). This established an ongoing engagement process to shape and inform WPD's plans • WPD's local Distribution Managers were trained to ensure consistency and quality of engagement and information shared and gathered • WPD's strategic investment planning and DFES process now include this activity into the annual cycle of updates improving the accuracy and robustness of local energy forecasting.

Figure 3.12 Examples of CEG scrutinising and informing our engagement approach

3.40 Throughout the RIIO-ED2 engagement process, CEG members have been given first hand insight into our activities by attending events such as workshops, market research events and have also scrutinised the process to create research materials and scripts ahead of engagement taking place. This has provided assurance that WPD is delivering the open, honest, transparent and non-leading engagement to which we have been committed from the start.

3.41 In addition, it has enabled CEG members to interrogate the synthesis reports that WPD produced after each engagement stage and assess whether WPD has accurately captured and interpreted stakeholders' views and sentiments.

3.42 Finally, it has allowed the CEG to scrutinise WPD's processes for 'playing back' its findings to stakeholders and explaining how these have influenced the Business Plan.

Providing independent challenge across WPD's business planning process

3.43 The CEG has considered and robustly challenged us in a number of areas, reviewing our proposals, draft plans and the processes by which these have been arrived at. The CEG has either raised formal challenges or clarification requests for further information. In both cases, we has acted promptly in response to every intervention. As a result, WPD's Business Plan is significantly more robust and is set to deliver more wide-ranging benefits for a wider variety of customers.

3.44 In total, there have been **24** challenges and **23** clarifications to date. Examples of these, along with WPD's response and improvements, are set out below:

Subgroup	CEG challenge/clarification	WPD response
Business Plan development	• We challenge WPD to set out the criteria through which it will internally assess and judge the quality of its Business Plan in advance of the final determination by the regulator	• A paper from our RIIO-ED2 Business Plan Manager (with approval from the Executive) highlighting the underlying principles to be followed in the preparation of WPD's RIIO-ED2 Business Plan – clearly defining how they will be used to measure the success of the plan. These principles will be visible within the final plan.
Innovation and Competition	• The CEG challenges WPD to test whether its DSO-focused approach to digitalisation delivers best value for customers compared to alternatives, such as an organisation-wide approach to data and digital that includes corporate functions.	• WPD's Digitalisation Strategy and Action Plan was been released for consultation, asking for customers' input on whether their expectations and priorities are being delivered as part of the current approach.
Regional Drivers / Net Zero	• We challenge WPD to clarify how it will effectively engage with national (Welsh), regional, and local energy strategies (including LEPs) to: firstly ensure it considers the impact of these strategies on its plans for network investment and services (e.g. flexibility services); and secondly to account for the variance in knowledge and engagement of these bodies.	• WPD produced a summary document of its approach to consultation in this area, in addition to an action plan, progress report and final report. We invited all 130 local authority stakeholders covered by the WPD area to participate in a bilateral meetings and offer feedback enabling them to build a joined-up energy plan and work towards delivering net zero carbon emissions targets. A set of recommendations was established to be implemented going forwards and factored into the development of the Business Plan.
Research and Customer	• What factors informed WPD's approach to consulting with stakeholders at the 'preliminary stage' of the Business Plan process?	• A paper outlining WPD's stakeholder engagement programme for the RIIO-ED1 business planning process (stage one: preliminary) was produced. The challenge raised resulted in WPD taking a broader approach to research than initially planned. An external benchmark exercise across a wide spectrum of sectors was commissioned, core engagement activities were expanded from four to fifteen and a stakeholder database was developed to capture all engagement activity across business (RIIO-ED2 and BAU). Synthesis and triangulation exercises were also introduced and completed following each Business Plan stage of engagement.
Asset Management	• We challenge WPD to set out the strategic position and overall health condition of the network, to understand the starting point ahead of the RIIO-ED2 process.	• Information relating to commercialisation of assets, asset health by area, future proofing, competition and cost breakdowns was compiled by WPD and shared with the group to establish and make clear, our RIIO-ED2 'starting point'.
Workforce Resilience	• The CEG challenge WPD to set ambitious goals and measurable targets which will enable the culture and workforce resilience needed to deliver ED2 goals and beyond.	• WPD's Business Plan has been updated to incorporate areas of concern, but work is ongoing to ensure work is progressed in the areas still outstanding.

Figure 3.13 Examples of CEG challenges and clarifications across the whole business planning process

Ofgem's RIIO-ED2 Challenge Group

3.45 To complement the work of the CEG, Ofgem has established a RIIO-ED2 Challenge Group to challenge network companies further on their Business Plans and provide an oversight of all the distribution network companies. We are looking forward to engaging fully with this group in 2021, including participating in Ofgem's Open Hearings process and explaining the iterative, staged process that has been followed with stakeholders to co-create the Business Plan. As set out in the section below, we will have published two drafts of our Business Plan for stakeholder consultation ahead of the submission of a revised and refined Plan to the Challenge Group on 1st July 2021.

Our ongoing approach to stakeholder engagement

Our engagement objectives for the RIIO-ED2 planning process

3.46 Our objectives for stakeholder engagement for RIIO-ED2 are to:

- Capture a robust view of what is expected by the broad range of stakeholders across our area
- Deliver the most ambitious and efficient Business Plan – shaped entirely by stakeholder needs and priorities (today and future) – that will act as a vehicle to achieve highest possible levels of service and performance for customers
- Deliver the best, most wide-ranging stakeholder engagement programme, in terms of:
  - Size and breadth of programme
  - Widest scope of influence ever for stakeholders
  - Engagement led by the experts and those responsible for delivery within WPD (to ensure discussions are as productive and meaningful as possible)
- Ensure every decision in the Business Plan is well justified and plans are co-created with stakeholders wherever possible
- Demonstrate that engagement has extensively influenced our decisions at every stage of the preparation, development and refinement of the Business Plan.
- Set new standards of transparency and accountability by simplifying and sharing the Business Plan with customers and stakeholders wherever possible

Overall RIIO-ED2 engagement process

3.47 As part of the RIIO-ED1 process, we followed a three stage engagement approach, with a further two stages to be completed after the plan is submitted to Ofgem. This approach was awarded a 'green' (positive) rating by Ofgem and cited as a key contributory factor in the decision to fast track our Business Plan. It encompassed:

Plan development:	1) Preliminary engagement; 2) Willingness to pay research; 3) Business plan development and consultation.
Post submission:	4) Business Plan outcomes; 5) Business Plan delivery/performance review

3.48 Before RIIO-ED2, we studied the processes used by water, gas and transmission companies for their latest price control reviews learned from best practice and identified opportunities to go further and deliver an industry-leading stakeholder engagement programme. We also began working with stakeholders on our approach as early as 2018, almost two years before we kicked off our formal RIIO-ED2 engagement programme in February 2020. We held a series of face-to-face workshops to discuss long-term strategic priorities beyond RIIO-ED1. As part of this, we invited Citizens' Advice to give a presentation at every event to introduce a best-in-class approach to engagement in RIIO-ED2. At the workshops, stakeholders discussed the ways customers would prefer to be engaged, their desired levels of involvement and their willingness to engage in RIIO-ED2. They also considered ways in which DNOs could give customers a stronger voice in future business planning. The outcome was that stakeholders would like to have a much greater influence than ever before.

	Overall importance (out of 10)	End users	Informed stakeholders	Expert stakeholders	Special interest groups	Industry parties	Consumer bodies	Ofgem
Outputs	7.4	✔	✔	✔	✔	✔	✔	✔
Incentives	6.7	✔	✔	✔	✔	✔	✔	✔
Innovation	7.9	✔	✔	✔	✔	✔	✔	✔
Expenditure	5.2		✔	✔	✔	✔	✔	✔
Financing	3.8					✔	✔	✔
Uncertainty mechanisms	5.0		✔	✔	✔	✔	✔	✔
Efficiency	4.8						✔	✔
Data assurance	3.5						✔	✔

✔ = input in RIIO-ED1 ✔ = desired input in RIIO-ED2

Figure 3.14 Areas of our Business Plan stakeholders have indicated they would like to influence

3.49 Acting on this stakeholder feedback, we built an engagement programme to deliver co-creation, improve on our leading approach to engagement in RIIO-ED1 and ensure the Business Plan is built in a staged, phased way with multiple points of stakeholder refinement and endorsement before the final plan is submitted.

A seven stage engagement process

3.50 When we submit our Business Plan to Ofgem, this will be built upon a five stage engagement process, with a further two stages to be carried out after the plan is submitted:

Stage	Objective	Deliverable(s)	Approx. timing
Stage 1: Preliminary engagement	Identify the high-level outcomes WPD should commit to deliver. Identify initial stakeholder priorities (areas where outputs and performance improvements are expected); to ensure all stakeholder interest areas have been recognised. Identify suitable representatives for future engagement.	High level outcomes Stakeholder priorities (grouped under outcomes) High-level view of stakeholders to engage	Jan – Nov 2019
Stage 2: High level social value research	Identify specific improvement levels within each priority area and their value to customers	Evidence of value placed on each high-level priority area Evidence of preference/expectation for service improvement levels	Nov 2019 – June 2020

Stage 3: Business plan development	Co-create early commitments with stakeholders Develop initial costing for each commitment	1st draft of commitments (grouped under outcomes/priorities) Initial costing for commitment (and therefore Business Plan as a whole)	Mar – Oct 2020
Stage 4: Business plan refinement (detailed social value research)	Negotiate output levels and refine our commitments	2nd draft of commitments Updated costing for each commitment based on changes	Oct – Feb 2021
Stage 5: Business plan acceptance testing	Present the final plan to stakeholders for review (and voting) before submission to Ofgem	Stakeholder approval of the final plan	Feb 2021 onwards
Post submission: Stage 6: *Business Plan monitoring*	*Identify the key performance measures stakeholders would like us to use to monitor progress against our promises*		*2022*
Post submission: Stage 7: *Business Plan performance review*	*Provide an update on our progress in delivering the Business Plan, our performance against key output measures and identify areas of emerging stakeholder interest or concern*		*2023*

Figure 3.15 stages of our stakeholder engagement process for RIIO-ED2

'Synthesis' – the collection and management of stakeholder feedback

3.51 The engagement which has shaped our RIIO-ED2 business plan has been significant. It has featured a range of methods and stakeholder involvement, and has been influenced by insights from additional external research and internal performance monitoring. Because of this, it has been essential to build the plan with stakeholders in stages, to allow the findings from each stage to influence and form the foundations for the next.

3.52 We have put systems in place to collect and organize:

- The sources of information including engagement and research
- The stakeholders with whom we interacted
- The feedback gathered

3.53 This resulted in synthesis reports which were published at the end of each of our five engagement stages. The reports summarised the views expressed and indicated how the synthesised feedback from each completed stage would shape the next stage of engagement. These reports, which were independently compiled by Sia Partners, were then passed to the CEG to be scrutinised, clarified and challenged to ensure key feedback was not left out. The reports demonstrated:

- The chronological stage at which customers and stakeholders influenced the development of the Business Plan and in what way (e.g. brain storming high level priorities from a 'blank piece of paper' or signing off specific service levels)
- How viewpoints compared across different segments and how the feedback collected was used by WPD to come to a final proposal

3.54 The reports enabled stakeholders to review the consolidated feedback at a single source, making it possible to track our transparent co-creation process from the engagement conducted, to the feedback collected, and finally to the decisions made in response. This included areas of conflicting stakeholder feedback which required further engagement to arrive at a compromise view.

Our engagement timeline and key activities

3.55 To date, we have engaged more than 4,500 external stakeholders on our plans for RIIO-ED2. Engagement has spanned stakeholders from across the knowledge and interest sectors: expert; interested; limited knowledge; future customer. Engagement carried out with stakeholders from specific levels is never carried out in isolation. We share the feedback collected with stakeholders from the other levels, and use the feedback gained to inform the content of our future engagement.

3.56 Examples of how our engagement methods are tailored to, stakeholder knowledge and interest

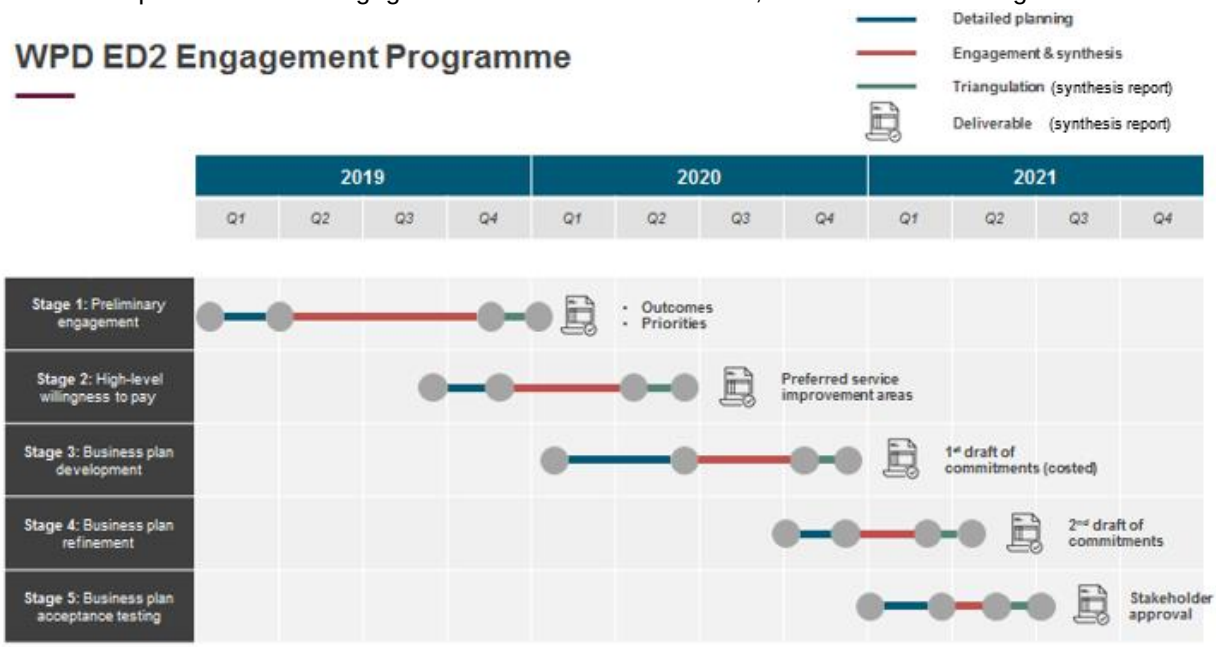

Figure 3.16 Engagement programme

level can be found in the following tables. The level of stakeholder is indicated in the last column based upon the key below:

Key – Stakeholder Level

1 Expert

2 Interested

3 Limited knowledge

4 Future customer

Ref	Engagement method	Description	Stakeholder groups involved / targeting	Total engaged	Stakeholder Level
1	**Customer Collaboration Panel**	**Workshops with WPD's permanent panel of 38 expert stakeholders, with representatives spanning all WPD's key stakeholder segments**	Domestic, business, connections, emergency resilience, healthcare, government, utilities, academic institutions, fuel poor and vulnerable	54	1
2	**Topic-specific bilaterals and expert workshops**	**Events with expert stakeholders to explore topics in greater depth and practical considerations and implications to be addressed. e.g. Vulnerability stakeholders; EV stakeholders (e.g. motorway service operators)**	Connections, vulnerable customers, electric vehicles, environment, future energy scenarios	740	1
3	**Local authority local energy plan bilaterals**	**Bilateral meetings with every local authority and Local Enterprise Partnership in our region to have in-depth discussions on local energy strategy, scenarios and projected low carbon technology and generation uptake volumes**	Local authorities and Local Enterprise Partnerships	130	1
4	**Co-creation stakeholder workshops**	**Qualitative workshops in a roundtable format, with reasonable levels of knowledge and interest in WPD's operations. Designed to identify priorities from scratch and co-create draft commitments to address these**	Domestic, small businesses, major energy users, parish councils, local authorities, consumer interest bodies, charities, connections providers, community energy groups, developers, trade associations, utilities, universities, environmental groups, storage providers, energy aggregators	945	1 2
5	**Local network investment and net zero workshops**	**Sessions hosted at local depots for key stakeholders with a regional planning focus**	Local authorities, vulnerable customer representatives, community groups, emergency services, non-profit organisations and charities.	435	1 2
6	**ICP/IDNOs conference**	**Workshop will be aimed at a connections customer audience, to discuss in particular RIIO-ED2 priorities, electric vehicles and local infrastructure plans**	Independent Connection Providers (ICPs), Independent Distribution Network Operators (IDNOs), local authorities, Local Enterprises Partnerships, distributed generation customers, developers and major users.	142	1 2
7	**Social obligations conferences**	**Conferences held in different locations aimed at vulnerable customer representatives to discuss WPD's social obligations strategy and programme delivery.**	Charities, local authorities, parish councils, non-Government organisations	110	1 2
8	**EV conferences and workshops**	**Conferences and workshops aimed at local authorities and the staff responsible for planning and implementing their electric vehicle plans - to discuss and support planning for current and future EV charging infrastructure projects.**	Local authorities	550	1 2
9	**Online engagement portal**	**Replicated WPD's face-to-face co-creation workshops online, with the presentations filmed, followed by a range of multiple choice and free-format questions. Promoted using Twitter, LinkedIn and invitations sent to all registered stakeholders.**	Domestic, small businesses, major energy users, parish councils, local authorities, consumer interest bodies, charities, connections providers, community energy groups, developers, trade associations, utilities, universities, environmental groups, storage providers, energy aggregators	57	2 3

Ref	Engagement method	Description	Stakeholder groups involved / targeting	Total engaged	Stakeholder Level
10	**Online Panel**	**Permanent online community with representatives spanning a range of customer demographics, age, gender and location. Particular focus on current and future end user customers and small businesses. Promoted prominently to all customers on WPD's homepage.**	Anybody who has registered an interest in the business via our website with targeted outreach to specific demographics as required. The overall objective is to have a fair and balanced representation across geography, age and gender	82	2 3
11	**Quantitative research surveys - *Customers in vulnerable situations***	**Telephone surveys with randomly selected customers as part of well-established satisfaction surveys following a day-to-day contact with WPD regarding the Priority Services Register. Questions independently designed with Accent to ensure they are neutral and non-leading.**	Customers in vulnerable situations	100	3
12	**Quantitative research surveys - *Major connections customers***	**Telephone surveys with randomly selected customers as part of well-established satisfaction surveys following a day-to-day contact with WPD regarding the major connections applications (+4 homes and above). Questions independently designed with Accent to ensure they are neutral and non-leading.**	Major connections customers	273	3
13	**Quantitative research surveys – *Distributed generation customers***	**Telephone surveys with randomly selected customers as part of well-established satisfaction surveys following a day-to-day contact with WPD regarding the distributed generation connections. Questions independently designed with Accent to ensure they are neutral and non-leading.**	Distributed generation customers	64	3
14	**Power cut follow-up surveys**	**Text message sent to every WPD customer as part of the power cut follow-up service, containing an invitation and link to participate in a series of survey questions on WPD's website**	All WPD customers affected by loss of supply	131	3
15	**Multi-phase deliberative, qualitative focus groups – *end users***	**Identify short and long term customer requirements, from a wide cross-section of representative end users, including future. It will scope out customers' current priorities (uninformed and, thus, uninfluenced by any specific WPD plans) as well as checking these against previously established priorities. It featured a comprehension session, extended priorities sessions, app-based tasks, and deliberative tasks. Co-creation sessions were then held to begin drafting commitments in customers' own words.**	Household, non-household, vulnerable (including representative sample of over 75s, struggling, in debt, low income, BAME communities)	100	3 4
16	**Citizen Panels**	**Panels of representative end user customers that will undertake deliberative exercises on a wide range of topics throughout the entire business planning process.**	Representative sample of customer base that meets a number of demographic and behavioural qualifiers including; age, gender, race, variance in needs and habits, customer in vulnerable situations, PSR customers, a mix of socio-economic circumstances, a mix of future and existing customers	75	3 4

Ref	Engagement method	Description	Stakeholder groups involved / targeting	Total engaged	Stakeholder Level
17	**Social media**	**A series of surveys and consultation questions posed via Twitter, Facebook and LinkedIn, also containing an invitation and link to participate in a series of survey questions on WPD's website.**	All WPD customers. The overall objective is to have a fair and balanced representation across geography, age and gender	509	3 4
18	**'Power for Life' newsletter and campaign**	**Newsletter sent directly to all 7.9 million WPD customers inviting them to participate in WPD's stakeholder engagement programme, including links through to the online engagement portal and to sign-up to the WPD Online Panel.**	All 7.9 million WPD customers		3 4
19	**Multi-phase deliberative, qualitative focus groups – *future customers***	**Scope out customers' current priorities (uninformed and, thus, uninfluenced by any specific WPD plans) as well as checking these against previously established priorities. It featured a comprehension session, extended priorities sessions, app-based tasks, and deliberative tasks. Co-creation sessions were then held to begin drafting commitments in customers' own words.**	Higher education students (those in Sixth Form or higher education colleges and living at home), further education students (living in halls, house shares or at home), first jobbers (living at home or flat/house shares)	54	4

Figure 3.17 Methods of engagement

Social value research

3.57 As a socially responsible company, it is essential we deliver services that are valued by our customers. To achieve this, we must first devise a robust way of measuring value. We commissioned PwC to conduct research into existing methods of measuring social value across a range of sectors. In 2020, we joined forces with the other DNOs to develop a system of measuring value that can be applied by all networks and arrive at consistent measures of the value delivered to customers as a result of our actions, combining social value proxies, social return on investment studies and bespoke social value research.

3.58 Social value is determined by asking customer to make a series of trade-offs between different levels of potential service delivery and to assign values to the preferred outcomes they would like us to deliver. We are not asking customers to pay more to fund these activities, but simply using the technique to gauge the value they place on the actions we can deliver.

3.59 We have used this data to calibrate the scale of our Business Plan commitments in light of the value customers place on certain activities. It should not be used as a straight cost benefit analysis tool, but helps us to consider the relative priorities between action areas within the plan. It enabled us to compare and contrast actions within different output categories and to then calibrate the scale of ambition and expenditure in line with customer feedback. For example, where there are a range of options under consideration which all respond to stakeholders' qualitative feedback, a factor such as very high social value may influence the scale of action we propose.

3.60 While all potential Business Plan outcomes may have value to customers, the focus must be to reveal priorities and rank potential activities and commitments. We have used this insight to inform our commitment levels, balancing expenditure and time constraints with stakeholder feedback.

High-level social value research

3.61 Working with market research company Accent, we held focus groups, followed by in-depth surveys with 1,188 customers, consisting of domestic (885) and businesses of multiple sizes (303). This was a statistical exercise in which customers made choices relating to priority areas.

3.62 The objective was to understand the priority customers would give to different areas of the Business Plan. These were taken from the synthesised feedback from WPD's 'Stage one: Preliminary engagement'. This process was scrutinised by the Customer Engagement Group to ensure appropriate attributes were selected and no key areas of stakeholder priorities were overlooked. In all cases, stakeholders were given current performance levels as context against which they could compare these potential improvement actions.

3.63 In total 24 attributes (potential actions) were tested. Examples include:

Key social contract attributes testing
Reduce the number of unplanned power cuts
Working with local communities to achieve net zero carbon emissions targets
Protect people who cannot afford to adequately heat their homes from being disadvantaged in the future
Provide proactive support and information to vulnerable customers during power cuts
Protect WPD's electricity network against cyber attacks
Encourage people into a career in engineering and increase the diversity of WPD's workforce
Reduce the number of environmentally harmful leaks of greenhouse gases and oils from WPD's equipment
Provide more charging points and greater network capacity to ensure all customers can switch to electric vehicles when they are ready to do so

Figure 3.18 Examples of social value attribute testing

3.64 The subject areas were tested first by qualitative focus groups, to make the language and context easier for respondents to understand. We then conducted quantitative surveys, asking a broad cross-section of customers to state their preferences.

3.65 The results revealed the most highly valued focus areas and helped us to decide on our first proposed actions and expenditure in each area. For example, qualitative co-creation workshops highlighted 'reducing the number of SF_6 leaks from equipment' as a key environmental priority. To address this, we had several options, from seeking to remove SF_6 from the system altogether to enhanced monitoring and risk registers. However, the costs and scale of these activities could differ widely. To help to arrive at an appropriate level for our first draft commitment proposals (for stakeholders to then consider, debate and refine), we used the social value attributed by our customers to identify the scale of our initial proposals and the associated costs in our first draft Business Plan.

3.66 All attributes were valued highly - both domestic and business customers attributed positive social value for all improvement actions tested. Consumer vulnerability, cyber and environmental initiatives broadly gained the greatest support and valuation from customers. Vulnerability was the single stand out area most valued by domestic customers with five out of six top valued attributes.

3.67 However there were indications of customers' priorities in this area that must be considered. For example, 'addressing fuel poverty' (valued at £2.00) was nearly twice as important an action than 'ensuring PSR customers only have to register with once to join the PSR of all utility companies' (valued at £1.15) – so the scale of our first draft outputs were recalibrated to reflect this.

Detailed social value research

3.68 As part of WPD's Business Plan refinement process, in February 2021 we will commence a second stage of social value research with customers to test the draft core commitments we are proposing. This will seek to measure the value to customers of delivering the intended positive outcomes of each action, including the value of options to do more or less than the initial level proposed. This exercise will help us to arrive at more specific commitments and performance targets, prioritising those with the highest intrinsic value to customers.

Attribute Description	Mean social value (expressed as a proportion of their average annual domestic electricity bill)
Protect people who can't afford to adequately heat their homes from being disadvantaged in the future	£2.00
Identify and help people who can't afford to adequately heat their homes	£1.92
Protect customers' data from potential cyber attacks	£1.50
Provide proactive support and information to vulnerable customers during power cuts	£1.41
Provide support and information to vulnerable customers to help them be more resilient to potential power cuts	£1.38
Improve the identification of customers potentially vulnerable during a power cut	£1.38
Reduce the number of environmentally harmful leaks of greenhouse gases/oils from WPD's equipment	£1.26
Support communities to install low carbon technologies such as community solar panels or community wind turbines	£1.19
Ensure vulnerable customers only have to register once for all utility companies	£1.15
Protect WPD's electricity network against cyber attacks	£1.13
Pay customers to use less electricity at peak times	£1.10
Reduce the number of unplanned power cuts	£0.99
Future proof the network by ensuring any work done doesn't need replacing before 2050	£0.92
Proactively provide affected customers with relevant updates during power cuts	£0.90
Working with local communities to achieve net zero carbon emissions targets	£0.88
Reduce the number of customers who have 12 or more power cuts over 3 years	£0.85
Reduce the average length of time of power cuts	£0.81
Reduce the carbon emissions from WPD's transport fleet	£0.79
Improve the quality of supply by reducing flickers and dips	£0.71
Provide more charging points and greater network capacity to ensure all customers can switch to electric vehicles when they are ready to do so	£0.67
Communicate the benefits/costs of low carbon technologies to help customers switch	£0.64
Help local authorities and communities switch to electric vehicles on a mass scale	£0.53
Make WPD's offices and local depots carbon neutral by 2050	£0.53
Encourage people into a career in engineering and increase the diversity of WPD's workforce	£0.48

Figure 3.19 Summary table of results – high-level social value findings (September 2020)

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Chapter 4

Our Core Commitments

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4. Our Core Commitments

Summary

4.1 This section details what we intend to deliver in RIIO-ED2 based on feedback from our stakeholders. We have created an ambitious and challenging programme of activity which focuses on delivering excellent customer service and operating an environmentally sustainable network while keeping bills affordable for our customers.

4.2 Our plan is underpinned by 67 core commitments which have been identified by stakeholders as their key priorities and will be reflected across all aspects of our Business Plan. Core commitments include actions funded by customers and key regulatory obligations.

4.3 In addition to these high level core commitments, we have drawn up a number of wider commitments, which will enable us to achieve our core commitments and deliver on the promises we made to stakeholders in response to their detailed feedback.

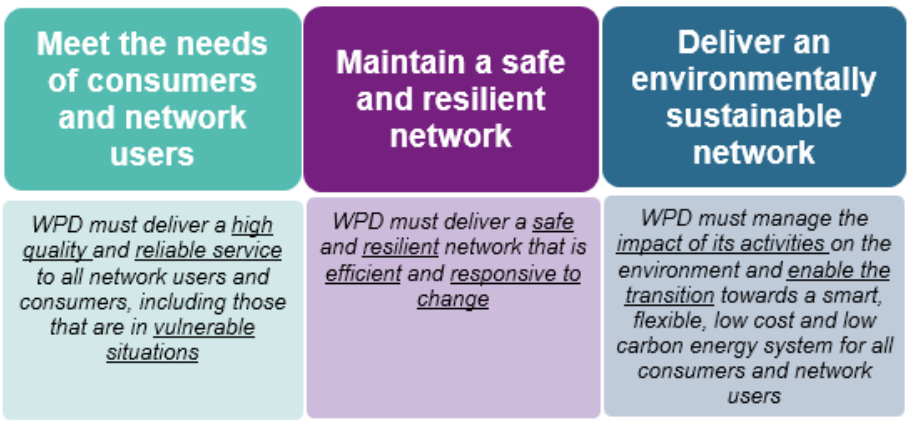

Figure 4.1 Ofgem's RIIO-ED2 high level output categories

4.4 Our core commitments are separated into three high level categories which align with Ofgem's output categories.

4.5 These are: to meet the needs of consumers and network users, maintain a safe and resilient network and deliver an environmentally sustainable network.

4.6 Our performance against these core commitments will be measured annually and will be used to ensure we are delivering what we said we would do. As well as reviewing our progress each year, we will establish an independent RIIO-ED2 Plan Delivery Challenge Group to hold us to account on behalf of our customers. The group will ensure that we keep on track to deliver our commitments.

4.7 As a business, we need to be dynamic in the way we adapt to changes. This means that while we have established a strong understanding of current requirements, we will need to ensure that we respond to changing needs. That's why we will continue to engage actively with our stakeholders throughout RIIO-ED2 and adapt our plan where necessary to address any new priorities.

Our RIIO-ED2 core commitments highlights

4.8 Below we have highlighted some of key commitments we will deliver in RIIO-ED2.

Figure 1.6 RIIO-ED2 key core commitments

4.9 We are committed to providing excellent customer service. We will continue to build on our success in RIIO-ED1 to ensure we maintain and improve our high levels of customer service. To this end, we want all customers to experience a satisfaction rate of at least 9 out 10 when dealing with WPD.

4.10 We are also committed to looking after our vulnerable customers. We have over two million customers on our Priority Services Register who benefit from additional support during power cuts. We make contact with these customers every two years to check they are receiving the services they need from us and to ensure that our contact records are up to date. We propose to support over 15,000 fuel poor customers each year, helping them to save more than £8m by working with our partner organisations.

4.11 Electricity is critical to enable all of us to go about our daily lives. That's why we strive to restore supplies as quickly as possible, when power is interrupted. We will continue to build on the success of RIIO-ED1 by ensuring we improve on our current performance where on average our customers have one power cut every two years lasting 24 minutes. We will also undertake 50 schemes to improve the network reliability for 5,900 of our Worst Served Customers.

4.12 COVID has impacted everyone, with some people suffering hardship. We have therefore supported 600,000 customers in our communities through our £1m 'In This Together - Community Matters' COVID fund, helping local organisations to reach out to those hardest hit by the pandemic. For RIIO-ED2 we are committed to allocating a minimum of £1m a year to continue to support local communities through this funding.

4.13 As part of our commitment to safety, we will carry out a critical project during RIIO-ED2 to divert, underground or fully insulate overhead lines crossing school playing areas. Although we are not aware of any incidents where our equipment has caused harm to school children, we are choosing to take action to mitigate any potential risk.

4.14 Cyber security is one of the items at the top of our agenda. We will conduct a continual assessment of potential cyber threats to ensure we have cyber security systems in place to protect our customers' data and to safeguard the network from a possible cyber-attack. As criminals become more sophisticated, it is our responsibility to invest in effective solutions to rule out potential threats.

4.15 As we move towards net zero, we must make sure our network is ready to support our stakeholders with the connection of electric vehicle charging points, heat pumps and renewable generation. Leading by example, we will focus on reducing our own business carbon footprint by 2043. We're already working to build a non-carbon fleet of vehicles, make our buildings more energy efficient and reduce our own electricity consumption, amongst other initiatives. We will also use 'offsetting' initiatives such as funding tree planting or supporting local photovoltaic installation schemes for the fuel poor. These local projects will benefit communities as well as the environment.

4.16 Stakeholders have also asked us to support the creation of community energy projects across our region. To do this, we'll be holding community energy surgeries where customers can make appointments with our expert advisers to learn more about community energy and how to get their own schemes up and running.

4.17 To deliver our commitments, it is important to have dedicated, committed and talented staff. We have a highly skilled workforce which will continue to evolve during RIIO-ED2 to meet the needs of our stakeholders. We aim to attract innovative and talented individuals with diverse views and backgrounds who are able to reflect, and respond to, the needs of our customers. We strive to create a culture in which everyone shares our commitment to excellent customer service and the delivery of our outputs, and where everyone feels able to contribute. We want our staff to be proud to be part of WPD.

A full list of our RIIO-ED2 core commitments

4.18 The following tables provide a summary of all 67 of the core commitments, which are then described in more detail later in this chapter.

1. Meeting the needs of our consumers and network users

1.1 Customer Service

Stakeholders have told us so far:		Core commitment	Current RIIO-ED1 performance	*RIIO-ED2 Current view*	Positive impact for customers
Customer service during power cuts is very important and remains a core priority for stakeholders. However, stakeholders consider WPD's existing performance to be very good, so they would like us to focus on maintaining current high levels of service and seek incremental improvements where possible. Stakeholders therefore want WPD to set targets to ensure we continue to deliver industry-leading performance. <u>Communication</u> Timely, clear communication is considered vital for customers, especially during power cuts. Whilst a dramatic improvement on current performance levels is not deemed necessary by stakeholders, they will not accept any regression. They would therefore like to see targets that aim for further improvement wherever possible. Stakeholders want WPD to offer a wide range of communication channels to suit the preferences of different customers. WPD must ensure it maintains the same quality of performance regardless of the method of contact a customer chooses. Improving information provided during planned power cuts, as well as unplanned incidents, is also very important to stakeholders. This should always include the estimated length of time the power will be off.	**1**	**Maintain a high standard customer satisfaction score across all key services areas.**	>89%	**90%**	Excellent and improved service across all key service areas, including power cuts, connections and general enquiries
	2	**Achieve full compliance with the Customer Service Excellence Standard every year.**	Full compliance	✓	Independent scrutiny of WPD's customer service processes and delivery. This includes benchmarking to other sectors to identify the latest best practice and new improvements WPD could adopt to enhance its services.
	3	**Answer calls within an average of four seconds and maintain an abandoned call rate of less than 1%, within our UK-based, in-region Contact Centres.**	2-4 seconds	✓	Customers virtually get straight through to speak to a call agent on the telephone
	4	**Respond to social media enquiries and power cut reports quickly**	6-7 minutes	**5 minutes**	Customers contacting us for a response on Twitter, Facebook and WhatsApp received a swift response
	5	**Provide greater insight on the planned work activity and interruptions on the network by creating an online viewer for our customers and stakeholders.**	New	✓	Enable customers access information online via a 'self-service' function, rather than needing to call us, if that is their preference
	6	**Achieve full compliance with the British Standard for Inclusive Service Provision every year.**	Full compliance	✓	Independent scrutiny of the accessibility and range of WPD's customer service, including communications channels, to help identify improvements
	7	**Resolve at least 90% of complaints within one day & resolve 99% of complaints within 31 days.**	90%	✓	Complaints resolved to the customer's full satisfaction very quickly

1.2 Customers in vulnerable situations

Stakeholders have told us so far:		Core commitment	Current RIIO-ED1 performance	*RIIO-ED2 Current view*	Positive impact for customers
<u>Power cut vulnerability</u> Stakeholders have been clear that the causes of vulnerability can be complex and changing. As a result they expect WPD to keep its Priority Services Register (PSR) up-to-date. But they are not just concerned about data quality, it is important this information is then used to deliver tailored advice and support to customers, particularly during emergencies. Vulnerability can be temporary so PSR data needs to be reviewed frequently, with enduring relationships built with customers, tracking those on the register. Stakeholders have told us that vulnerable customers should not be expected to register multiple times with multiple companies (for	**8**	**Proactively contact over 2 million Priority Service Register customers once every two years to remind them of the services we provide and update their records**	30% via direct telephone call; 70% by letter/email	**40% via direct telephone call**	Regular contact to keep vital data on the needs of our most vulnerable customers accurate and up to date. Ensure WPD's PSR is representative of the needs of vulnerable customers with appropriate representation from high deprivation areas. More 'in person' contact enables bespoke advice to be delivered to meet that individual's needs
	9	**Achieve a 'one-stop-shop' service for vulnerable customers joining the Priority Services Register so that they only have to register with WPD once to be registered automatically with their energy**	Manual data shares with 80% of water companies	✓	Customers no longer have to register multiple times with each individual utility company in order to receive priority support

example, with WPD, their supplier, gas company and water company). WPD should therefore collaborate with other agencies to share PSR data (where we have consent to do so) and a move towards a national PSR should be supported. Fuel poverty Stakeholders view protecting fuel poor households as a WPD obligation because there is a direct correlation between power cut vulnerability and fuel poverty. This has increased in importance as a result of the Covid-19 pandemic. Many customers living in cold homes are unlikely to seek out this support so WPD should proactively identify and engage those requiring support, utilising a wide range of partners and existing community outreach programmes. Stakeholders have told WPD to ensure our interventions treat the causes of fuel poverty and achieve lasting improvements for customers, rather than just treating the symptoms via short-term fixes, like hardship funds. For example, WPD should help community energy schemes that may be able to help to combat fuel poverty in their communities. Smart future It is crucial that vulnerable customers are not left behind in the transition to a smart and flexible energy system. WPD must first understand the needs of vulnerable customers in a low carbon energy future and identify those who may not be able to access new services and the reasons why, in order to devise solutions to avoid them being adversely affected. WPD should harness innovation to find ways of using new technologies and services to have positive impacts for the fuel poor.		**supplier, water company and gas distributor.**			
	10	**Identify and engage hard-to-reach vulnerable customers each year to join the Priority Services Register within RIIO-ED2**	20,000 a year	**30,000 customers**	Customers with the most serious vulnerabilities are proactively identified and offered support
	11	**Work with expert stakeholders, including our Customer Collaboration Panel and referral partners, to annually refresh our understanding of 'vulnerability' and co-create an ambitious annual action plan.**	As per commitment	✓	We will seek to continually improve our services for vulnerable customers and respond quickly to changes in expectations or requirements
	12	**Support fuel poor customers to make savings on energy bills over RIIO-ED2.**	70,000 customers saved £27m in the last 5 years	**75,000 customers to save £40m**	Customers living in cold homes and/or struggling to afford their energy bills received tailored support to make long term changes to improve their ability to afford to heat their home
	13	**Develop a model to identify the capabilities of vulnerable customers to participate in a smart, low carbon future. Use this to maximise participation, remove barriers to entry and encourage collaboration with the wider industry**	New	✓	Understand the abilities of vulnerable customers to take part in a smart energy future so we can develop targeted initiatives to support them
	14	**Provide vulnerable and fuel poor customers with specific support and education in relation to the smart energy transition**	New	**Support 20% of PSR per year**	Targeted advice and support for vulnerable customers in relation to low carbon technologies, smart meters, and flexible energy services for example
	15	**Take a leading role in initiating collaboration with a range of industry participants to share best practice and co-deliver schemes to ensure vulnerable customers are not left behind by the smart energy transition**	New	✓	Share best practice with other network operators and initiate collaboration where it will lead to better outcomes for customers than if we had acted alone

1.3 Connections

Stakeholders have told us so far:		Core commitment	Current RIIO-ED1 performance	*RIIO-ED2 Current view*	Positive impact for customers
Provide accurate, comprehensive and user-friendly information Stakeholders want to see a continual focus on improving the availability of information for connections customers, ensuring it is easily accessible and clearly communicated. This should include helping customers to interpret data, particularly first time connection customers who may not have a detailed knowledge of the connections process. In particular stakeholders want more support to help customers navigate new and complex information around connecting low carbon technologies. They believe WPD should extend the range of flexible connection options for customers, as alternative to conventional reinforcement, to provide the network capacity required. This should include helping to develop connections consortiums to share costs and capacity. Simple and transparent connections process	**16**	**We will develop our connections process and improve availability of information so that customers wishing to connect can easily comprehend the process and follow a simple set of rules to apply for a connection**	New	✓	The connections process is easy for customers to understand form the outset. Before applying customers know exactly what to expect and what information will be required.
	17	**Maintain a high standard average customer satisfaction for connections**	>89%	**90%**	Excellent and improved service across all aspects of the connections process including quotations and completed works.
	18	**Improve our performance against Time To Quote and Time To Connect for LCTs from RIIO-ED1 Level**	Measure to be introduced (current response time to LCT enquiries = 4 days)	**1% Improvement**	Customers receive quick and timely service for quotations and completed connection works
	19	**Engage with 130 local authorities and local enterprise partnerships to understand their requirements for strategic**	Meetings on ad hoc basis	**Once every three years**	Ensure the local energy requirements in each of our regions are fully understood and feed into

Stakeholders want to see the processes between WPD and independent Distribution Network Operators developed to ensure smooth interactions across contestable connections activities. They have also requested greater engagement with independent connection providers to share best practice, including for non-contestable works. WPD should provide a named point of contact to help to guide customers through the connections process. The process and language used needs to be further simplified to help customers with less technical knowledge to apply for a quotation. Local authorities in particular would like to be able to access the contact details of WPD local network planners, in order to better engage on planning applications ahead of submission. <u>Deliver timely connections</u> Local authorities would welcome regular and early engagement with WPD at a strategic planning level, to try to avoid the risk of network constraints ahead of time. To aid this, stakeholders feel that WPD should continue to allocate capacity for a limited period of time, and to make this available again if it is not utilised in a reasonable amount of time.		**investment in terms of changes in demand or network use.**			our long-term strategic planning in a timely and effective way
	20	**Improve cross border working practices between WPD, Independent Distribution Network Operators, National Grid Transmission and the Energy System Operator. Also promote competition in connections**	New	✓	Ensure that customers are able to obtain efficient and effective response to their connection requirements regardless of where multiple parties are involved, including where customers choose to proceed with a competitive connections provider

1.4 Social contract

Stakeholders have told us so far:		Core commitment	Current RIIO-ED1 performance	*RIIO-ED2 Current view*	Positive impact for customers
Stakeholders have made it clear that they expect more from WPD than a reliable supply of electricity at a reasonable price – this is viewed as a basic expectation. As WPD delivers an essential public service for a population of +20 million people, stakeholders state that it must demonstrate its legitimacy, both as an excellent service provider, and as a good corporate citizen more widely. As one of the largest DNOs, stakeholders indicated that it is vital that WPD connects with the local communities it serves and builds trust in the services it provides and the way it operates. They believe we are accountable for contributing to wider societal wellbeing (including environmental and economic benefits). Our stakeholders suggested a social contract as a way to outline the commitments to our customers that go above and beyond WPD's regulatory requirements and generate additional social value. Stakeholders therefore suggested that a social contract should be a standalone and enduring document, not just for a business plan period. They suggested 15 key aspects that the standalone social contract should contain – ranging from transparency about how customers' money is being spent (both in terms of shareholder dividends and tax affairs), to protections for customers in vulnerable situations, to explicit initiatives to ensure WPD delivers a positive contribution to society and the environment. However, given that WPD's Business Plan must also cover actions in a number of similar areas	**21**	**Publish annual reports in a simple, easy to understand format, setting out WPD's total expenditure, the impact on customer bills and regulatory returns**	New	✓	Provide customers with transparent information to enable them to understand our performance and financial returns and hold us to account for our delivery
	22	**We will, as a minimum, maintain our prime Environmental, Social and Governance (ESG) rating from a recognised agency.**	'Prime' status (Threshold = C+ rating; Actual = B rating)	✓	Independent scrutiny of WPD's environmental, social and corporate governance initiatives to provide stakeholders with a view of WPD's performance relative to wider UK PLC and to identify improvements
	23	**Support local people in our communities via an annual 'Community Matters' Fund**	New	**£1m**	Act as a socially responsible business that will support the needs of the local communities we serve – delivering key corporate social responsibility initiatives to help people in vulnerable situations
	24	**Provide staff with paid leave to volunteer to support local community initiatives associated with vulnerability and environmental initiatives.**	New	**1,000 volunteer days per year**	Expand the impact, scope and reach of community and charity initiatives across WPD's regions, to deliver for the wider social good of people living in WPD's service territory

(e.g. vulnerability and environment), stakeholders feel that the social contract must inform the social responsibilities and overall behaviours that will underpin the Business Plan itself. Of particular importance to stakeholders is that we report our performance in a transparent way, so that we can be held to account for our performance, particularly for the actions we take in relation to our social responsibility. Wherever possible this should include robust, independent assessment of our performance so that stakeholders can have faith in the validity of our reporting. In terms of the initiatives WPD should deliver, stakeholders want to see substantial support for the social needs of the local communities WPD serves. This has risen significantly as a stakeholder priority throughout 2020 in light of the Covid-19 pandemic with stakeholders seeing a clear role for WPD to partner with local community groups to help those who are most isolated and deprived in society.					

2. Maintaining a safe and resilient network

2.1 Network resilience

Stakeholders have told us so far:		Core commitment	Current RIIO-ED1 performance	*RIIO-ED2 Current view*	Positive impact for customers
<u>Network Performance</u> Stakeholders continue to value network reliability as a top priority. In particular, keeping the lights on and providing quick restoration during power cuts is critical. Stakeholders feel WPD service levels are currently very good, with the number of customers affected and duration of power cuts at their lowest ever levels. However, stakeholders have stated that WPD should seek continual improvement, aiming for further power cut reductions and reducing power cut duration. <u>Tree Management</u> Overhead lines carrying power can be affected by the proximity of trees. To ensure the future resilience of the network, tree management is carried out to prevent the trees damaging the lines and causing power cuts. Stakeholders would like to see WPD carry out tree cutting only where absolutely necessary and in the most cost-effective way possible. <u>Flood Defences</u> Flooding can affect network assets and stakeholders want coordination and collaboration with the Environment Agency to share knowledge and get involved in scenario planning and strategy development. <u>Targeting Investment</u> Stakeholders recognise that investments need to be prioritised to get the greatest benefit. They support that WPD must maintain a data-	**25**	**On average fewer and shorter power cuts in ED2 than RIIO-ED1.**	On average customer experience 1 power cut every 2 years, lasting 24 minutes	✓	Customers receive a highly reliable supply of electricity, delivering our lowest ever power cut levels with an average duration of less than 24 minutes per year
	26	**Reduction of tree related faults on HV and EHV overhead network due to use of LIDAR in RIIO-ED2 thus reducing the impact on the customer.**	New	✓	Provide quicker and more accurate information about tree Growth so we can better target our tree trimming to reduce the risk of power cuts
	27	**Continue to have focus on restoring HV supplies quickly (that are not automatically restored) within one hour.**	>85%	**86%**	Minimising the disruption and inconvenience to customers, by restoring power as quickly as possible
	28	**We will aim to restore customer supplies in RIIO-ED2 within 12 hours under normal weather conditions.**	70 customers over 12 hours	✓	Minimising the disruption and inconvenience to customers, by restoring power as quickly as possible
	29	**Carry out work that improves network reliability for our Worst Served Customers** **(those experiencing 12 or more higher voltage power cuts over a 3 year period)**	48 schemes	**50 schemes** ***(benefitting 5,900 customers)***	Significantly improved supply reliability for customers that have experienced a significantly poorer service (higher volumes of power cuts) than the average. Improvements will result in less inconvenience and disruption for customers.

driven approach, using high-quality asset data to make informed decisions. Safe Networks Stakeholders expect us to operate a safe network, so they would like us to continue our extensive programme of inspections, and maintenance to ensure equipment is safe and does not pose a hazard to customers.	**30**	**Invest to improve the overall health of the network and develop a measure of overall asset health. Report annually to stakeholders on the impact of our investments**	£180m per annum	**Incrementally improve asset health: £190m per annum**	Reducing the risk of unplanned power cuts by improving the reliability of our network by replacing equipment in the poorest condition
	31	**We will continue to install further flood defences to reflect updated data from the Environment Agency.**	Flood defences at 72 substations	**95 schemes to be done in RIIO-ED2**	Improve the resilience of the network to severe flood, therefore reducing the risk of power cuts and disruption to customers

2.2 Business IT Security and Cyber Resilience

Stakeholders have told us so far:		Core commitment	Current RIIO-ED1 performance	*RIIO-ED2 Current view*	Positive impact for customers
Enhancing Cyber Security The risk of disruption due to hackers and the need for robust cyber protection has risen considerably in importance for stakeholders over the last three years. In particular stakeholders have flagged the importance of ensuring the continuity of electricity supplies and to protect customer data, with the latter raised as the higher priority of the two. Stakeholders were clear that WPD should be 100% resilient to cyber attacks, encouraging collaboration between companies to share best practice and stay ahead of hacking technology. In particular, they asked for assurances that we would take the appropriate actions to mitigate and correct any identified network vulnerabilities, and create and maintain well-tested recovery plans. To identify threats, stakeholders want to see WPD collaborate and work with third party experts, including those in Government.	**32**	**Continually assess emerging threats to enhance cyber security systems to ensure no loss of data or network interruption from a cyber attack**	As per commitment (Additional expenditure in ED2 is proposed to respond to increasing threats)	✓	Personal customer data will be protected and the risk of power cuts as a result of cyber attacks will be kept to a minimum
Disaster Recovery and Future Proofing The impacts of cyber threats could be severe for customers. Therefore, stakeholders asked for a specific focus to be included on disaster recovery plans. As the network becomes increasingly digitalised, new threats to cyber security will inevitably emerge. A priority for stakeholders is that WPD introduces mechanisms to keep pace with these changes and ensure continued resilience into the future. Stakeholders want to see planning that covers anticipated changes in future demand and structure as, for example, reliance on electricity in heat and transport becomes greater.	**33**	**Enhance the resilience of our IT network security by upgrading our disaster recovery capability to ensure continuity of our operations**	As per commitment (Additional expenditure in ED2 is proposed to respond to increasing threats)	✓	We minimise the risk that we will not be able to operate the network and provide our typical service to customers because of disruption to our IT systems

2.3 Safety

Stakeholders have told us so far:		Core commitment	Current RIIO-ED1 performance	*RIIO-ED2 Current view*	Positive impact for customers
Safety Our engagement with stakeholders reinforced that maintaining a healthy, safe and motivated workforce is a critical priority. They want to see WPD continue to work collaboratively with stakeholders and legislators to co-develop and share the best possible health and safety practices.	**34**	**Undertake an additional Staff Safety Climate Survey during RIIO-ED2.**	Once	✓	WPD will have a safe and healthy workforce to enable us to maintain our services for customers

Across the industry, communication has been identified as an issue and is particularly pertinent to ensuring the health and safety of our staff and customers. Addressing this is important to stakeholders, along with incident management, including debrief procedures, the provision of personal protective equipment (PPE) to staff in dangerous environments and up-to-date health and safety training. Likewise, stakeholders insist that WPD must continue to plan, install and maintain our existing assets to meet all legal obligations and ensure that they do not compromise health and safety. They would like WPD to extend existing health monitoring programmes and implement plans to minimise any areas that impact on the health of our staff, such as mental health and the safety implications of connecting new and emerging technologies to the network. <u>Customer Safety</u> The safety of our customers is vital, and remains an enduring priority for stakeholders. They want to see us continue to use our profile and industry expertise to raise awareness of the dangers of electricity to members of the public. The way we approach our outreach is very important to customers. They feel that communication to increase awareness about WPD and the dangers of electricity should start at an early age to promote the greatest possible understanding of electrical safety.	**35**	**Distribute safety advice information to stakeholders**	62,500 per year	**200,000 per year**	Keep our customers safe – particularly those that need to work in close proximity to our equipment
	36	**Educate a minimum of children per year about avoiding danger from electricity**	Target: 50,000 per year	**60,000 children per year**	Keep children safe around our electricity equipment and reducing the risk that they could come to harm
	37	**Underground, insulate or divert overhead lines that cross school or other playing areas.**	New	**780 Schemes to be done in RIIO-ED2**	Reduce the risk of harm to the general public, in particular younger children

2.4 Workforce resilience

Stakeholders have told us so far:		Core commitment	Current RIIO-ED1 performance	*RIIO-ED2 Current view*	Positive impact for customers
<u>Workforce Resilience</u> In terms of workforce resilience, a happy, healthy and motivated workforce where WPD is the employer of choice is the highest priority for stakeholders. They consider it especially important that employees feel appreciated in their jobs, and that WPD cultivates a culture of 'belonging' within its workforce. To maintain the future resilience of our company and adapt to the changes that will result from the Net Zero transition, good planning is of critical importance for stakeholders, ensuring WPD anticipates future needs and remains well-resourced as an organisation. While they champion the personal development and retention of our employees, stakeholders have acknowledged that outside recruitment can provide a new perspective and a wider set of skills and experiences. <u>Diversity & Inclusion</u> As a traditional engineering employer, WPD is not as diverse as it could, or indeed should be. Stakeholders have recognised that there needs to be a conscious effort to reach a demographic outside the traditional white British male population, to diversify and increase the talent pool. Stakeholders believe it is important for WPD to work with younger generations, offering a range of apprenticeship opportunities and promoting STEM (science, technology engineering and mathematics) subjects in schools.	**38**	**Demonstrate exceptional embedded employment practices by achieving accreditation with Investors in People by the end of RIIO-ED2**	New	**Silver (top 33% of UK companies)**	Customers receive excellent service as a result of a motivated, highly-skilled and knowledgeable workforce
	39	**Publish annually our updated Diversity & Inclusion Action Plan & Performance**	New	✓	Improve the quality and tailoring of our services by having a workforce that reflects the diversity of the communities we serve

They want to see diversity prioritised throughout recruitment, from apprenticeship schemes to senior management. They have recommended ways to diversify WPD's talent pool by establishing unbiased recruiting processes, for example as well as working with a range of charities and partner organisations and tackling barriers to entry to aid social mobility. Stakeholders also stated that WPD must ensure its company culture is inclusive and fosters equal opportunities, with equal pay for equal skill and closing the gender pay gap, as a minimum.					

3. Delivering an environmentally sustainable network

3.1 Environment and sustainability

Stakeholders have told us so far:		Core commitment	Current RIIO-ED1 performance	*RIIO-ED2 Current view*	Positive impact for customers
<u>Our Business Carbon Footprint</u> Stakeholders rightly want to see WPD leading by example in the Net Zero transition, with ambitious Science Based Targets (SBTs) that go above and beyond those set by the UK government. Key to achieving this will be the reduction of emissions from WPD's vehicle fleet and adopting electric vehicles, as well as reducing the number of miles travelled. As a priority, stakeholders expect WPD to increase the use of low-carbon energy at WPD properties and ensure buildings are carbon neutral ahead of government targets. <u>Operational Impact</u> Not only must our own carbon footprint be a priority, our stakeholders have articulated the importance of improving the environmental impact of our operations. In this area, stakeholders have made it clear they will not be satisfied with unambitious strategies; they want to see substantial commitments that surpass ED1 levels, particularly in reducing harmful leaks from WPD's equipment. As a minimum, WPD must control gas leaks, as the potential impact is catastrophic, while eliminating the use of SF6 is also a priority. To future-proof the sustainability of our operations, stakeholders want to see WPD predict leaks wherever possible and replace ageing infrastructure, particularly oil-filled cables. <u>Impact of our network</u> To reduce the environmental impact (including visual) of our network, the undergrounding of cables is a desired output. Stakeholders expect WPD to continue to invest in newer and more efficient equipment to reduce technical losses, and to address the amount of generated waste sent to landfill. In this area, they would like to see WPD go further, considering all waste entering the business, with a target of zero waste by 2030. To achieve these objectives, stakeholders have asked for a collaborative approach; WPD should seek to consult with experts and local environmental intelligence to better understand the negative impact of our activities on the environment and biodiversity.	**40**	**Reduce internal Business Carbon Footprint to be Net Zero by following a verified Science Base Target to limit the climate impact to of our activities.**	New	**Net Zero 2043**	Accelerate a reduction in carbon emissions to minimise our impact on climate change
	41	**Replace our transport fleet with non-carbon technology where practical.**	New	**Replace vehicle at end of life: 79% commercial van fleet to be non-carbon vehicles by 2023**	Accelerate a reduction in the carbon impact of our transport fleet in the areas where our customers live and work
	42	**Install renewable local generation at all suitable offices and depots.**	New	✓	Ensure the delivery of our operations and services for customers is carried out in an environmentally responsible way, with all WPD sites run on clean, green energy
	43	**Reduce leaks from fluid filled cables**	55% reduction to 20,213 litres lost per year	**30% Reduction**	Significantly reduce the risk of harm to the local ecology and protect habitats and specifies in the regions we operate in
	44	**Replace the poorest performing Extra High Voltage fluid filled cables (FFC) on our network.**	44.8km	**70km of FFC Replacement**	Significantly reduce the risk of harm to the local ecology and protect habitats and specifies in the regions we operate in
	45	**Reduce SF_6 losses from that in RIIO-ED1**	Leakage rate of 0.2% of the total SF6 on WPD's system.	**10% reduction in SF6 losses**	Improve WPD's carbon footprint by reducing the risk of leaks from environmentally harmful gases from WPD's equipment
	46	**All PCB contaminated equipment will be removed from the WPD network by 2025.**	New	✓	Significantly reduce the risk of harm to the local ecology and protect habitats and specifies in the regions we operate in
	47	**Reduce tonnage of waste per £ total business expenditure**	3.2 tonnes of waste per £1m annual turnover	**20% reduction**	Ensure our service for customers are delivered in an environmentally responsible way, reducing the carbon impact of our operations
	48	**Reduce waste to landfill (excluding hazardous waste)**	10-20%	**Achieve 10% waste to landfill**	Ensure our service for customers are delivered in an environmentally responsible way, reducing the carbon impact of our operations
	49	**We will remove targeted overhead lines in Areas of Outstanding Natural Beauty**	29km	**40km of overhead lines removed by 2028**	Improve the visual amenity of the landscape in beauty spots across our operating region
	50	**Where a low voltage mains cable is required it will be a minimum size of a 300mm^2 cable and for the smallest pole mounted transformer size will be 50kVA single phase to reduce technical losses**	New	✓	Improving the efficiency of the network in order to save customers money by reducing the energy lost as part of the distribution process

3.2 A Smart and Flexible Network

Stakeholders have told us so far:		Core commitment	Current RIIO-ED1 performance	*RIIO-ED2 Current view*	Positive impact for customers
Flexibility Services Flexibility is viewed by stakeholders as a key part of the provision of network capacity as load grows on the network. As flexibility is based upon contractual arrangements, stakeholders insist that rules and tariffs must be simple and standardised to ensure that it is easy to participate in the flexibility market. Information should be clear and enable domestic, commercial and community customers to understand how they can participate in providing flexibility services. WPD must, therefore, work to facilitate network flexibility and educate end-customers. Digitalisation In order to best support our customers' planning and unlock innovative approaches to decarbonisation, stakeholders want us to provide clear, simple and easy access to high quality data. Therefore, as a priority, WPD should make as much data as possible open and easily available, in a format that customers can understand and use. Stakeholders have expressed that sharing data could facilitate and encourage collaboration, for resulting in more efficient outcomes for customers. Scenario Planning and Whole Systems Collaboration with other utilities and companies within the energy industry is viewed as hugely important by stakeholders in order to arrive at the most effective and efficient solutions. They believe this will provide the necessary clarity about where the network has the capacity for more renewables. Stakeholders expect WPD's collaboration, particularly with local authorities, to engage with local development proposals so that areas of growth can be accurately identified. Further, they would like to see WPD help more low carbon technologies to connect, in line with local net zero ambitions. For stakeholders, providing the best possible outcomes for customers is crucial. They have proposed that WPD could improve the ease and cost for customer participation in flexibility services by acting as a facilitator to bring together the many parties involved in emerging energy service markets.	**51**	**Create and implement simple, fair and transparent rules and processes for procuring flexibility services and introduce a customer satisfaction monitor to measure the effectiveness of our actions**	New	✓	Expand the roll out of flexibility services by making it as easy as possible to provide these services. This will help to maximise the efficiency of the existing network, avoiding the cost to customers of carrying out conventional network reinforcement
	52	**Produce forecasts of flexibility requirements in order to undertake a flexibility tender every 6 months**	Annual	✓	Provide advanced sight and greater certainty of WPD's flexibility requirements so that providers can better plan ahead and make longer-term investments to be able to provide these services
	53	**Develop a standard to be measured against (using external scrutiny) to demonstrate that we act as a neutral market facilitator to enable accessibility to multiple markets**	New	✓	We allow all customers in all markets (e.g. flexibility) to gain fair access to our networks and systems
	54	**100% load related reinforcement (primary) decisions include an assessment of flexibility alternatives**	New	✓	Choosing the most effective option to provide required capacity will minimise network costs for all customers
	55	**Ensure that connection offers with a reinforcement requirement are given options of flexible alternatives.**	New	**Threshold to offer an ANM option:** **Reinforcement cost is >£125k per MW and/or works will take more than two years to complete**	More customers can choose between a conventional reinforcement solution or a cheaper and quicker flexible solution
	56	**Increase the range of options for flexible connections**	2 types available: (real-time Active Network Management; and pre-scheduled/timed)	**3 types**	More customer groups and a greater number of connection applications can benefit from flexible solutions
	57	**Make it as easy as possible for our customers to connect LCTs, such that WPD connects more than the national average connecting in the UK (prorated by our number of customers)**	New	2% **higher than national average of LCT connection volumes**	Customers can easily connect low carbon technologies without delays due to a lack of available network capacity
	58	**Improve the volume of data available via an interactive, API (Application Programming Interface) relative to all data made available (e.g. via spreadsheets and fixed format reports)**	0% of network data via an API	**60%**	Easier automatic access to network data, with the ability to tailor data requests to the customer's specific requirements and in a format of their choosing
	59	**Introduce a customer satisfaction monitor to measure data availability, ease of access and usefulness, improving from the baseline throughout RIIO-ED2**	New	✓	Ensure WPD has a better understanding of the effectiveness of our actions to provide access to network data in order to better identify service improvements for customers
	60	**Using data from updated DFES and stakeholder insight to publish a Long Term Development Statement and a Network Development Plan annually**	Annual	✓	Provide advanced sight and greater certainty of WPD's network capacity so that customers planning new connections can better plan ahead and make longer-term investments
	61	**Engage with stakeholders and the Electricity System Operator to update WPD's Distribution Future Energy Scenarios for all four licence areas**	Every 2 years	**Every 2 years**	By creating more accurate, detailed scenarios with customer input we can deliver an efficient and economic network ready for the future needs of our customers

	62	**Hold Local Energy Surgeries for local authorities, supporting them to develop their local energy plans**	>10 per year	**30 per year – covering all WPD operating regions (e.g. per county) once**	Helping local authorities and developer to create local energy plans that are achievable and help to deliver a network ready for the future
	63	**Undertake whole system collaboration schemes with other DNOs and the ESO**	New	**2 schemes by 2028**	Looking across the wider energy system to provide capacity for the future needs of our customers in the most efficient way

3.3 Innovation

Stakeholders have told us so far:		Core commitment	Current RIIO-ED1 performance	*RIIO-ED2 Current view*	Positive impact for customers
Stakeholders believe that WPD is well-placed to lead the way with innovation, helping to facilitate change across the industry and drive the UK's decarbonisation. They were clear that WPD must act on stakeholder feedback and lobby for change in order to avoid the issues that have occurred in previous national projects e.g. the smart meter roll out. While being an industry leader, WPD should not strive to work alone, but in collaboration with both the wider energy industry and other industries altogether. Stakeholders want to see us support companies and individuals to develop innovative projects, and to work with major energy users to develop intelligent solutions to reduce current demand. Stakeholders have suggested that innovation research and case studies are a great vehicle to communicate opportunities for collaboration with partners. Therefore, WPD should prioritise publishing research and projects (both successes and failures) to foster a dialogue with potential partners.	64	**For each innovation project we will undertake a cost benefit assessment and implement into business practice to improve efficiency and effectiveness of assets, operations and customer service**	New	✓	Successful innovation is quickly rolled out across the business to improve day-to-day operations to improve WPD's efficiency and overall quality of service for customers
	65	**Develop an interactive 'innovation ideas portal' aimed at stakeholders submitting ideas for new innovation projects**	New	✓	Making the process of creating new projects and submitting ideas more accessible, will accelerate innovation. More projects will be created to facilitate the cost-effective transition to a low carbon future, delivering financial and environmental benefits to customers quicker

3.4 Community energy

Stakeholders have told us so far:		Core commitment	Current RIIO-ED1 performance	*RIIO-ED2 Current view*	Positive impact for customers
Stakeholders identified supporting community energy projects as one of the highest priorities for WPD in relation to driving innovation and new services, given the large numbers of people in local communities it could benefit. They see a key role for community energy groups in the low carbon transition, both in terms of installing green, renewable generation but also for communities to increasingly flexibility services. Community energy groups state they are often interested in developing low carbon technologies renewable connections but tend to be slow to react to opportunities around flexibility, which stakeholders felt WPD should try and influence. Stakeholders raised the importance of WPD providing education and support, as some groups may lack the knowledge and expertise in relation to the energy network, with some simplification and hand-holding throughout the connections	66	**Hold Community Energy Surgeries for local Community Energy groups**	10 per year	**30 per year – covering all WPD operating regions (e.g. per county) once**	Community groups with less knowledge and expertise of the connections process receive tailored support to develop their schemes and connect to the network. This will increase their confidence and understanding of our processes, so that they find it easier to gain access to our network

process in particular. As well improving the availability of network information, WPD needs to help with the interpretation of data for those that may not have the required understanding of the energy industry. Stakeholders discussed the importance of community energy projects as a base for innovation extensively, especially as it was felt that this could benefit a lot of people which would also help to share knowledge and information. In particular stakeholders would like to see projects developed specifically to ensure community energy schemes benefit from Ofgem's Innovation funding mechanisms. As well as supporting the low carbon transition, stakeholders can see a role for community energy schemes to help to address fuel poverty, with community energy champions able to advise their neighbours as they will be trusted and can build on the existing relationship.	**67**	**Establish dedicated innovation projects for Community Energy schemes**	-	✓	WPD's support for community groups will extend beyond just helping them to connect to the network, by working in collaboration to help WPD to develop innovative, tailored solutions that benefit these types of connecting customer

Meeting the needs of customers and network users

Delivering the service that our customers deserve

> ***The independent auditor said***
> *"Staff are empowered to contribute to the improvement of operations and procedures and it was clear from discussions and observations during the visit that staff feel their contributions to service delivery are highly valued. Staff are proud to be part of an organisation with such an outstanding reputation for customer service."*

4.19 The delivery of consistently excellent customer service is at the heart of our operation and is firmly embedded in our culture. Our continued excellent performance in the RIIO-ED1 customer satisfaction measures – with average satisfaction above 8.9 out of 10 - demonstrates this commitment. This is also supported by the views of our stakeholders and independent assessment.

4.20 We understand the importance of being transparent and allowing customers and stakeholders to hold us to account and measure us against our peers and the wider industry. It's equally important that we continue to improve, adapt and refine our customer service provision by measuring our performance and using feedback from customers.

4.21 The transition to a smart, flexible low carbon network will bring significant change and uncertainty and an even greater need for excellent customer service. The new services and interactions we will introduce during the transition must deliver the same excellent experience for customers. That is why we need to measure this effectively, allowing us to identify opportunities for improvement and assuring our customers of our unwavering commitment to provide the highest levels of service.

4.22 Our stakeholders have consistently asked us to be a leading voice, representing their views at industry level, with the regulator and the government. To be most effective, we must be able to do this from a position of leadership and trust, delivering industry-leading customer service and demonstrating our customers can trust us to do the right thing.

4.23 During RIIO-ED1, we have recorded the highest average customer satisfaction of all the DNOs in Ofgem's Broad Measure of Customer Satisfaction (BMCS).

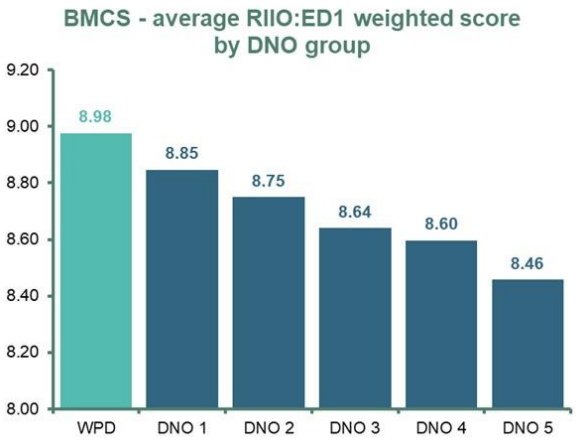

Figure 4.3 Broad Measure of Customer Satisfaction

4.24 We have delivered consistent, exceptional customer satisfaction performance throughout RIIO-ED1. In Ofgem's Broad Measure of Customer Satisfaction WPD's overall customer satisfaction for the last 5 years is 8.98/10 (or 89.8%). In a separate index, the Institute of Customer Service (ICS) reports that their top rated member companies in the UK for overall customer satisfaction are John Lewis (85.3% or 8.5/10), Nationwide (84.4% or 8.4/10) and First Direct (84.2% or 8.4/10)..

4.25 Independent accreditation provides both a useful assessment and an opportunity to identify further improvements. We has been certified by the Customer Service Excellence standard since 1992 (it was previously known as the Charter Mark). Each year, an independent assessor carries out a rigorous audit including a two day visit and assesses our performance against set criteria. Each area is awarded one of four ratings: 'Compliance Plus' (UK-wide best practice); 'Compliance'; 'Partial Compliance'; or 'Non-Compliance'. In 2020, we achieved 45 out of 57 'Compliance Plus' ratings (the top UK performer out of 600 companies), with no instances of non-compliance.

Our customer service outputs for RIIO-ED2

What our stakeholders said about customer service

Stakeholder Top Priorities	
1	Customer service during power cuts is very important and remains a core priority for stakeholders.
2	Timely, clear communication is considered vital for customers, especially during power cuts.
3	Stakeholders want WPD to offer a wide range of communication channels to suit the preferences of different customers. WPD must ensure it maintains the same quality of performance regardless of the method of contact a customer chooses.
4	Improving information provided during planned power cuts, as well as unplanned incidents, is also very important to stakeholders.

Figure 4.4 Stakeholder top priorities for customer service

Customer satisfaction

4.26 We will improve our average customer satisfaction to 9 out of 10 or higher across all key services – delivering leading performance in Ofgem's Broad Measure of Customer Satisfaction (BMCS). We have consistently delivered industry-leading performance in Ofgem's BMCS survey and will continue to do so by refining and improving activities in response to survey feedback and our stakeholder engagement programme.

Core Commitment 1	**Maintain a high standard customer satisfaction score of 9 out of 10 or higher across all key services areas**

4.27 As increasing numbers of electric vehicles and heat pumps are connecting to our network, we must ensure that we maintain service levels in this area, facilitating the transition to net zero. We will achieve this by measuring customers' satisfaction with the advice and services we provide to those looking to install low carbon technologies.

Customer Service Excellence (CSE) Standard

4.28 We will achieve full compliance with the CSE Standard and undergo rigorous external assessment and benchmarking every year to evaluate our performance in relation to accessibility, customer service and stakeholder engagement. This is crucial to ensure we continue to improve and provide the best possible service for customers.

4.29 The CSE Standard provides a level of independent scrutiny and perspective that goes beyond simple validation. This challenging feedback is fundamental to the process of identifying service improvements and innovations.

Core Commitment 2	**Achieve full compliance with the Customer Service Excellence Standard every year**

Telephone response

4.30 To provide good customer service, it is essential that we enable customers to talk to us and get the response they need. That's why we have highly trained customer service advisors in our own Contact Centres, ensuring customers can talk to us in person. Stakeholders tell us that being able to speak to a call-taker in person is still a high priority and that failure to get through can be very frustrating. Our in-house telephony platform prevents any calls from being 'dead ended', and means that customers who choose to speak to an advisor have their call answered in an average time of under four seconds. We will continue to operate regionally based, in-house Contact Centres with good staffing levels to provide a high quality service and fast response. We have a strong track record of answering calls quickly and will continue to uphold this.

4.31 When experiencing exceptionally high call volumes, we increase the number of advisors available by using trained staff from across the company to maintain service levels and quality of response. Trained advisors are also able to take calls at home, in the event of bad weather. Our home working capability ensures we can increase the number of advisors quickly and at short notice.

4.32 Abandoned calls arise when customers decide to hang up before they speak to an advisor. This typically occurs when customers are being kept on hold for a long time. Our policy of answering calls quickly results in less than 1% of calls being abandoned.

Core Commitment 3	**Answer calls within an average of four seconds and maintain an abandoned call rate of less than 1%, within our UK-based, in-region Contact Centres.**

Social media response

4.33 Increasingly, customers choose to use alternative means of communication, such as social media. We have responded by developing new channels of communication, which share the same ethos as our telephony response, providing the same quality of service and quick response times.

4.34 We will continue to expand the use of social media as a means of contact and customer interaction, ensuring that response times and service quality are of an exceptional standard. Based at our in-house Contact Centres, our dedicated team of social media advisors enables customers to talk to us around the clock, using the platform of their choice. These now include Twitter, Facebook, WPD's smart device app, WPD Power Cut Reporter app, text message, website, info email, WhatsApp and Webchat. We respond to all social media enquiries in an average time of less than five minutes, and to Webchat within 45 seconds.

4.35 We will continue to identify where improvements can be made to maintain our response times as well as providing ongoing training for our staff and using the latest technology to issue automated messaging during power cuts.

Core Commitment 4	**Respond to social media enquiries and online power cut reports quickly.**

Communications during power cuts

4.36 Customer feedback highlights the importance of regular and accurate information during power cuts. Therefore we will provide restoration times and progress updates on every planned and unplanned outage using a range of communication channels. We will provide customers with information on every outage, contacting them proactively using their preferred method of communication whether that is call back, text message, WhatsApp or WPD's smart device apps.

4.37 We will also provide accurate information on all network outages using our online power cut map and the WPD smart device apps, enabling customers to access information for themselves as well as setting up and receiving bespoke alerts. We will use feedback from customers on each of these service channels to develop further improvements.

Core Commitment 5	**Provide greater insight on the planned work activity and interruptions on the network by creating an online viewer for our customers and stakeholders.**

4.38 We provide a wide range of inclusive customer contact channels and accessibility tools, and have achieved full compliance with the British Standard for Inclusive Service Provision every year.

Core Commitment 6	**Achieving full compliance with the British Standard for Inclusive Service Provision every year.**

Rapid resolution of customer complaints

4.39 While we strive to deliver excellent customer service at all times, there are occasions when we will fall short of what our customers expect. In these instances, it is very important that we act swiftly to resolve the matter to the customer's satisfaction and that we are able to learn from these instances to avoid any future repetition.

4.40 Our track record during RIIO-ED1 has been strong in this area, outperforming our RIIO-ED1 target for resolving complaints within one day. To maintain this performance, an achievement that is important to our stakeholders, we must continue to focus on this area. That's why we're committed to going further than the Ofgem BMCS standards and continuing to deliver industry-leading performance for our customers.

4.41 We are committed to ensuring that our staff contact the person making the complaint at the earliest opportunity to fully understand the nature of the issue and to seek to resolve it to the customer's satisfaction as quickly as possible.

Core Commitment 7	**Resolve at least 90% of complaints within one day and resolve 99% of complaints within 31 days.**

Guaranteed Standards of Performance awareness

4.42 Guaranteed Standards of Performance (GSOPs) set out the minimum service standards that DNOs must meet under Ofgem's regulatory framework. Where a standard is not met, a payment must be made to the customer. GSOPs cover the provision of connections, supply interruptions and response to problems such as voltage complaints.

4.43 Where we are aware of a failure, a payment will be made without the need for a customer to make a claim. However, stakeholders are not always aware of the framework of GSOPs or how and when they may apply to the services they receive. Because of this, we are committed to increasing awareness and knowledge of GSOPs.

Customer vulnerability

4.44 Customer vulnerability presents itself in many different ways and means that some people are more dependent on essential services for support. Examples of vulnerable customers might include a young person with autism living independently for the first time, a lone parent with very young children or someone with a critical medical dependency on electricity.

4.45 We currently support around 1.5 million vulnerable customers a year through proactive power cut information and advice, fuel poverty guidance and by identifying hard-to-reach customers who are encouraged to join the Priority Services Register for the first time. Our stakeholders consistently tell us that providing support for customers in vulnerable situations should be a key priority for us.

4.46 Vulnerable customers often face additional challenges such as difficulties with the costs of household utility bills. In RIIO-ED1, our stakeholders made it clear that we should use our interactions with customers to identify and provide help and support to those struggling with fuel poverty. As a result, we have significantly expanded the support given to those dealing with fuel poverty and, by working with trusted partners, have been able to deliver significant savings of £27 million for over 70,000 customers so far during RIIO-ED1.

4.47 Vulnerable customers are also at risk of missing out on benefits associated with the shift to a smart energy system, which is necessary to achieve net zero. We are committed to ensuring the energy transition is just and fair, and that no customer is left behind.

4.48 Our established customer vulnerability strategy has been key to delivering successful outcomes for customers. Our aim is always to deliver tangible actions, outputs and benefits for customers. The core strategy has been updated and refined each year in partnership with our stakeholders and is subjected to rigorous external assessment and scrutiny each year. This has led to significant additions to the strategy, including a greater emphasis on addressing fuel poverty and protecting the interests of vulnerable customers during the smart energy transition.

4.49 The clarity of our strategy ensures that it is understood by everyone at WPD. As a result, the strategy is becoming more deeply embedded in all our operations and means that all staff have an awareness of the work we can do to support the vulnerable. This extends from field teams working on the network, to staff handling customer calls and innovation engineers delivering schemes for a low carbon future.

4.50 Most importantly, the strategy must remain effective and fit for purpose. This drives us to deliver excellent outcomes for customers, identifying and responding quickly to changes in their expectations and requirements.

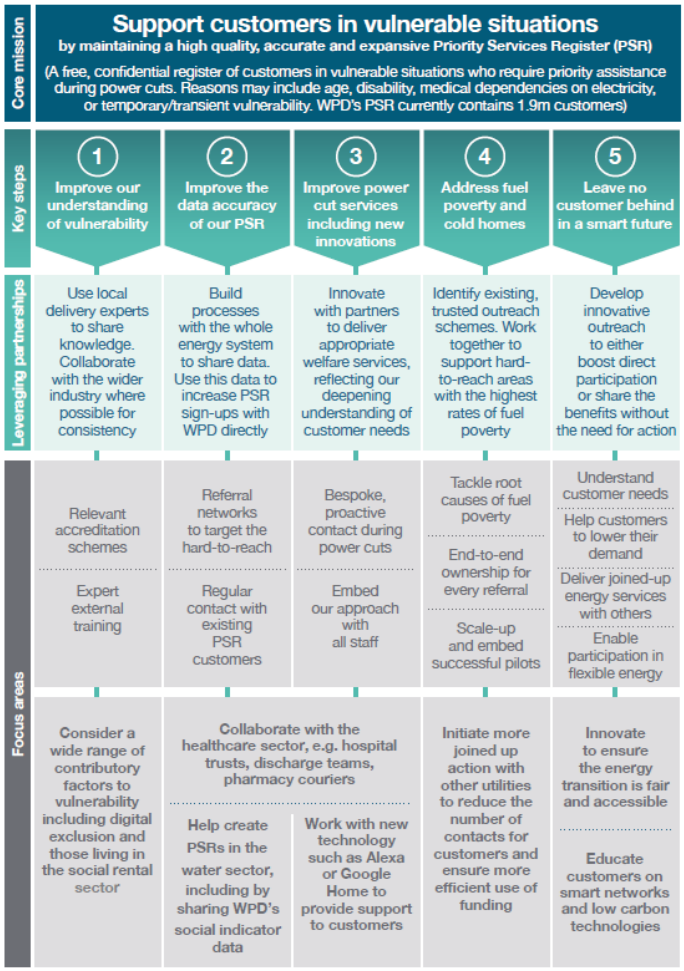

Figure 4.5 Supporting customers in vulnerable situations

Our customer vulnerability commitments for RIIO-ED2

What our stakeholders said about the customer vulnerability and fuel poverty

Stakeholder Top Priorities	
1	Make sure no one is left behind in the transition to a smart network, especially customers in vulnerable circumstances and in fuel poverty
2	Develop and continue to expand partnerships with carers and charities such as Citizens Advice
3	Facilitate better data sharing and work towards creating a centralised PSR
4	Educate customers and raise awareness of the PSR, using a range of methods, to increase the number of people signing up
5	Work with Ofgem to allow data to be safely shared with other utilities
6	Provide funding and increase the support given to referral networks
7	Continue to identify vulnerability by working with partners including local authorities, disability forums and health and social care providers

Figure 4.6 Stakeholder top priorities for customer vulnerability

Maintain a Priority Services Register (PSR)

4.51 The PSR is crucial to our work to support vulnerable customers during power cuts. It is also the basis for our initiatives to help increase customers' resilience to power cuts and address any problems they may have with energy affordability.

4.52 The effectiveness of the PSR and its role in helping us to look after our vulnerable customers depends on its accuracy. Our dedicated PSR data cleanse teams are trained to give specialist advice to PSR customers when contacting them to update their records. They proactively contact one million customers in vulnerable situations each year.

4.53 We will also use targeted social media campaigns, working with local agencies, including those in the health sector, to broaden awareness and increase understanding of the PSR among the vulnerable and those who support them.

Core Commitment 8	**Proactively contact over 2 million Priority Services Register customers once every two years (40% via direct telephone call) to remind them of the services we provide and update their records.**

One stop shop for Priority Services customers

4.54 We will develop cross-referrals with partner agencies to ensure customers only need to register with one agency to benefit from the services of multiple agencies. Thanks to a network of over 150 partner agencies and other utilities, we will be able to increase data sharing and achieve a 'one-stop-shop' service for vulnerable customers wishing to join the PSR whilst ensuring all General Data Protection Regulations requirements are met.

Core Commitment 9	**Achieve a 'one-stop-shop' service for vulnerable customers joining the Priority Services Register so they only have to register with WPD once to be registered automatically with their energy supplier, water company and gas distributor.**

4.55 Our consumer vulnerability data mapping enables us to see where potentially high volumes of vulnerability align with gaps in our PSR take-up. As part of our strategy, we will reach out to

trusted local agencies which can help to extend our support to these areas, ensuring more comprehensive coverage.

4.56 To provide bespoke support for customers and increase the reach of our programme, we must locate the hardest to reach and most in need, establishing effective, trusted contact through a single point and continually improving the accuracy of the data we hold.

4.57 To ensure we reach all customers considered vulnerable, we will identify a further 30,000 'hard-to-reach' vulnerable customers each year and encourage them to join our PSR.

Core Commitment 10	**Identify and engage with over 30,000 'hard-to-reach' vulnerable customers each year to join the Priority Services Register within RIIO-ED2.**

Customer Vulnerability Action Plan

4.58 While we have already developed a Customer Vulnerability Strategy highlighting our commitment to vulnerable customers, we have been challenged by stakeholders to go further when it comes to identifying vulnerability. In response to this, we will work with expert stakeholders, including our Customer Collaboration Panel and referral partners, to refresh our definitions and understanding of 'vulnerability' each year and co-create an ambitious annual action plan to develop new, innovative outreach initiatives for the vulnerable and fuel poor.

4.59 We will also hold annual consumer vulnerability workshops to engage these expert stakeholders and work with them to develop our understanding of vulnerability, share best practice and understand the priorities which need to be addressed. We will also use this engagement to collaborate on the annual update of our Customer Vulnerability Strategy.

Core Commitment 11	**Work with expert stakeholders, including our Customer Collaboration Panel and referral partners, to annually refresh our understanding of 'vulnerability' and co-create an ambitious annual action plan**

Customer resilience (to power cuts)

4.60 Vulnerable customers often need extra support during a power cut. That is why we are committed to developing innovation trials to understand how the opportunities presented by new technologies, such as smart networks and low carbon technologies, can be used to provide increased resilience for customers in vulnerable situations.

4.61 We will also provide advice on what to do in a power cut, including promotion of the 105 power cut phone number. We will measure referrals to the PSR arising from these initiatives.

4.62 We plan to work with expert stakeholders to develop resilience planning specifically targeted at premises such as care homes, refuges and shelters providing care for the vulnerable.

Partnerships, outreach services and fuel poverty

4.63 Our stakeholders have made it clear that we should continue to use the partnership hub model to deliver customer outreach schemes. They have challenged us to increase the number of partners we work with, broadening the scope of our support interventions, particularly when enabling customers to access opportunities presented by smart low carbon initiatives.

4.64 Our work to support those in fuel poverty through a network of referral partnership schemes has already helped 70,000 customers to save £27 million so far in RIIO-ED1. Stakeholders have asked us to continue to offer this service in the communities we serve. To increase the impact of

our support services, stakeholders have asked us to prioritise the identification of fuel poverty, helping us to understand more about the circumstances which can lead to customers struggling with their bills. By doing this, we will be able to identify customers who may be affected, refining the scope of support and our ability to target those in greatest need.

4.65 In RIIO-ED2, we are committed to supporting more than 75,000 fuel poor customers to save over £40m. We'll do this by developing a range of tools to increase our understanding of fuel poverty and to identify customers impacted, enabling us to target our outreach services most effectively. This will include engagement with our partners and other expert stakeholders to share best practice and increase understanding of circumstances leading to fuel poverty and the support which can be provided. Our annual consumer vulnerability workshops will provide the platform to collaborate with stakeholders and co-create the areas of our consumer vulnerability strategy dealing with fuel poverty. We will also update our data mapping to improve the granularity and detail of fuel poverty indicators to support the effective targeting of outreach services.

Core Commitment 12	**Support over 75,000 fuel poor customers to directly save over £40m in RIIO-ED2.**

Protect the interests of vulnerable customers in the switch to a smarter network

4.66 We are committed to delivering a fair and just transition to a smart network and net zero carbon economy. Our stakeholders are very supportive of our robust and ambitious plan which ensures those who are vulnerable or in fuel poverty are not left behind and are able to access the opportunities to reduce costs.

4.67 We are committed to identifying how vulnerable customers can participate in a smart low carbon future and remove any barriers to entry. We will use a consumer classification model to recalibrate our existing partner outreach schemes to provide more holistic support to the vulnerable and fuel poor, particularly in relation to the smart energy transition.

Core Commitment 13	**Develop a model to identify the capabilities of vulnerable customers to participate in a smart, low carbon future. Use this to maximise participation, remove barriers to entry and encourage collaboration with the wider industry.**

4.68 We are committed to providing education and support for consumers and stakeholders to drive the uptake of opportunities in the smart energy transition and low carbon economy.

Core Commitment 14	**Provide vulnerable and fuel poor customers with specific support and education in relation to the smart energy transition.**

4.69 We will ensure all WPD innovation schemes take into account the possible effects on vulnerable customers. We also want to design innovation schemes which will enable communities and the fuel poor to benefit from the use of smart systems and low carbon technology.

Core Commitment 15	**Take a leading role in initiating collaboration with a range of industry participants to share best practice and co-deliver schemes to ensure vulnerable customers are not left behind by the smart energy transition.**

Connecting to our network

4.70 We will continue to deliver the excellent customer service that customers seeking electricity connections have come to expect. This means a fast and efficient connections service from a customer's initial application, through to the final connection and energisation. Customers also want more information before their application, as well as regular contact throughout the process and feedback following connection. These are areas that we are already working on and will continue to focus on in RIIO-ED2.

4.71 The connection of new customers sometimes requires network reinforcement which may involve significant cost and delays. We have introduced alternative connection solutions (such as Active Network Management) which enables connections to be made more quickly and for a lower cost, and where the customer agrees to the possibility of some form of curtailment when the network is operating at full capacity. Customers need to know what alternatives may be available to enable them to make an informed choice.

4.72 The continued roll out of competition in connections has seen an increase in the number of services that be provided by third parties over RIIO-ED1. There are now 13 Independent Distribution Network Operators (IDNOs) across Great Britain that own and operate distribution networks within our area. These IDNOs generally use Independent Connection Providers (ICPs) to build the network before taking ownership of it. The ICP can now determine the point of connection to our network using information made available through online tools. With the relevant accreditations, they can also approve their own designs and undertake work to make the connection to our network.

4.73 IDNOs and ICPs are increasing their market share which demonstrates that competition is effective and that there is a choice for customers. It is important that we continue to work with both types of organisations to ensure that the initial customer for the connection (usually the developer) and the end user receive the best outcome in terms of customer service and value.

4.74 During RIIO-ED1, we are committed to improving customer service on a number of fronts:

- Provide a faster and more efficient connections service
- Improve communications with customers
- Enhance engagement with major customers
- Facilitate the competitive market

4.75 We have achieved a high standard for customer service with a connections customer satisfaction score averaging 8.99 out of 10. We aim for zero Guaranteed Standards of Performance connections failures and so far we have had only six failures during in RIIO-ED1, against the 350,000 budget estimates and quotations we have provided and 150,000 connections made.

Our connections service commitments for RIIO-ED2

What our stakeholders said about the connections

Stakeholder Top Priorities	
1	Invest ahead of need and undertake forecasting for EV connections to ensure sufficient capacity, e.g. new apartment blocks
2	Increase the speed of the connections process
3	Offer more flexible connections (particularly at 11kV)
4	Ensure that information about the connections process is clear and simple for customers without technical backgrounds, especially for heat pumps
5	Hold a series of connections workshops at a local level for customers, using local case studies
6	Develop clear information / guides for small developers, planning consultants and customers to support them through the application process

Figure 4.7 Stakeholder top priorities for connections

Our Connections Strategy

4.76 We recognise that, during RIIO-ED2, we will be operating in a rapidly changing energy market with a focus on achieving net zero. We will ensure that our customers have access to quick, simple and affordable electricity connections which will support electric vehicles, heat pumps and other emerging technologies.

4.77 We will ensure that our electricity infrastructure can sustain the growth in demand, whatever the take-up. We will do this by using a range of conventional means, flexible services and other innovative solutions.

4.78 Excellent customer service is key to a positive relationship with our connections customers. We will continue to engage with our stakeholders, build on our long standing relationship with them to understand their priorities and create further initiatives to improve our customer service.

4.79 Our Connections Strategy will outline our plans to enable connections stakeholders to make informed decisions, deliver value for customers and carry out timely and economical connections to meet customers' needs.

4.80 We remain committed to competition in connections in RIIO-ED2 and will continue to innovate where there is potential to improve the process.

Quicker and more efficient connections

4.81 The need to provide quick and efficient connections at an affordable price remains a high priority for our stakeholders.

4.82 We will continue to explore the viability of a different approach to the delivery of quotations, particularly in relation to larger, more complex connections. Stakeholders have told us that the speed of a quote is not always the most important thing, if this means that accuracy is compromised.

4.83 In RIIO-ED2 we will further improve our end-to-end connections service as follows:

- Continue to explore innovative ways of connecting low carbon technologies and build on initiatives, to introduce large capacity, rapid electric vehicles charge points at strategically important locations such as motorway service areas

- Enhance our online service to provide a wider range of online quotations
- Ensure that customers have a single point of contact at both the quotation and the connection stage to provide updates and advice
- Achieve a minimum 9 out of 10 average customer satisfaction score for connections activities
- Produce our Connections Strategy which will define our overall plan for delivering the high quality connections service that our customers deserve
- Improve our ability to provide quotations and connections in a timely manner and in line with customers' expectations
- Improve clarity concerning the availability of flexible connections and promote access to deliver more efficient network utilisation
- Develop tailored processes for meeting different customer groups' needs

Core Commitment 16	**We will develop our connections process and improve availability of information so that customers wishing to connect can easily understand the process and follow a simple set of rules to apply for a connection.**

Core Commitment 17	**Maintain a high standard average customer satisfaction score of 90% or higher for connections.**

Core Commitment 18	**Improve our performance against Time to Quote and Time to Connect for LCTs by 1% from RIIO-ED1 Level.**

Continuing to deliver an excellent connections service

4.84 During RIIO-ED2, we will continue with our strategy of stakeholder engagement to ensure we are delivering the service that connections customers want.

4.85 We will continue to hold our annual connections conference to engage with our connections customers on specific issues relating to new connections activities.

4.86 We will hold discussions with all of our 130 local authorities and local enterprise partnerships to ensure we understand their requirements for strategic investment to support the green recovery and achieve net zero. This will also allow us to provide them with capacity information and further advice to help develop their Local Area Energy Plans.

4.87 We will continue to interact with our stakeholders through well-established channels such as workshops, seminars and expert panels, in line with our strong belief that face-to face discussion is the best method of communication. However, we will also embrace other platforms, such as webinars, Zoom and MS Teams, which allow for virtual contact without the need for travel time or hosting costs.

Core Commitment 19	**Engage with 130 local authorities and local enterprise partnerships every three years to understand their requirements for strategic investment in terms of changes in demand or network use.**

Catering for our major connections customers

4.88 We recognise that our major connections customers, such as housing developers or distributed generators, have additional needs compared to smaller customers, because of the complexity of their schemes. These stakeholders have told us they require additional support and more interactive communication to steer them through the connection process. For this reason, we will ensure that these customers have a single point of contact in our planning team at the quotation stage and with one of our technicians at the connection stage.

4.89 We will continue to hold local connections surgeries which allow major customers to book an appointment with our local planning team to discuss planned connections.

4.90 Our Customer Connection Steering Group (CCSG) remains an important part of our customer engagement and will continue to be in place for RIIO-ED2. The group meets three times a year and is hosted by our directors and senior managers. The CCSG provides feedback on proposed initiatives and a strategic steer, ensuring that we address the priorities identified by our connection customers.

Facilitating a competitive connections market

4.91 We have fully embraced the concept of competition in the connections market place and are fully committed to removing any barriers to competition in RIIO-ED2. Although we believe the competitive market is very well established, we will continue to innovate where there is potential to improve the process.

4.92 Although we provide an excellent and cost effective connections service, we believe that customers should be free to choose an alternative provider such as an IDNO and ICP to install and operate their electricity networks. We will ensure that we give transparent and timely responses to enquiries from these companies to allow them to connect to our network.

4.93 We will continue to work with our industry partners such as the National Grid's Electricity System Operator (ESO) and Electricity Transmissions (NGET), as well as other DNOs, to ensure a whole systems approach to providing larger connections. This means we will advise customers of a more cost effective connection option offered by another network, if we believe this exists.

Core Commitment 20	**Improve cross boundary working practices between WPD, Independent Distribution Network Operators, National Grid Transmission and the Energy System Operator. Also promote Competition in Connections.**

WPD's Social Contract

4.94 As the largest DNO in the UK, it is vital we connect with the local communities we serve, building and maintaining trust in our service and the way it is delivered.

4.95 That's why we are producing our very first Social Contract which includes additional actions to be delivered as part of our Business Plan and highlights our commitment to making a positive social impact.

4.96 We began consulting with stakeholders to co-create this Social Contract in February 2019 and have engaged extensively with expert bodies, including Citizens Advice and Sustainability First. Their joint feedback challenged us to demonstrate our commitment to customers and the communities we serve. We are determined to make sure customers know what they get for their money and that we are serious about our social and environmental responsibilities.

What is a social contract?

4.97 WPD's Social Contract will allow us to be held to account by our stakeholders.

4.98 Our stakeholders want us to provide a reliable electricity supply at a reasonable price – but they are also taking a greater interest in where their money is going and want to see us contribute to society and protect the environment. That's why we're making clear commitments to do this, going beyond the basic requirements of regulation and legislation.

4.99 As part of RIIO-ED2, stakeholders called on us to deliver a social contract that differs from traditional corporate social responsibility commitments. They identified key aspects to be included, with measurable targets wherever possible, and placed significant importance on external reviews and transparent reporting as important ways of demonstrating delivery.

Our social contract core commitments for RIIO-ED2

What our stakeholders said about the social contract

Stakeholder Top Priorities	
1	Deliver excellent service (at a fair price)
2	Get the basics right (with ongoing feedback from customers)
3	Display excellent corporate behaviours (and governance)
4	Meet sustainability and climate change challenges
5	Build links and a clear understanding of the communities it serves

Figure 4.8 Stakeholder top priorities for the social contract

How our social contract was built

4.100 As well as taking part in co-creation workshops with stakeholders, we have been a key contributor to the 'Fair to the Future' project, led by Sustainability First. This scheme aims to define a 'sustainable licence to operate' and has heavily influenced the development of WPD's Social Contact. We aim to go beyond the minimum standards needed for licence compliance and to demonstrate our commitment to key focus areas identified by our stakeholders. This includes engaging extensively with stakeholders to understand, address and meet their changing needs.

4.101 As a result, the objective structure of WPD's Social Contract is to:

- Provide transparent reporting (with clarity on returns and profits)
- Demonstrate WPD is a diverse and responsible employer
- Evidence the legitimacy of our operations for the future

- Play an active role regionally, and support vulnerable customers.

4.102 Co-creation with stakeholders resulted in the identification of 15 key focus areas to achieve these four overarching objectives:

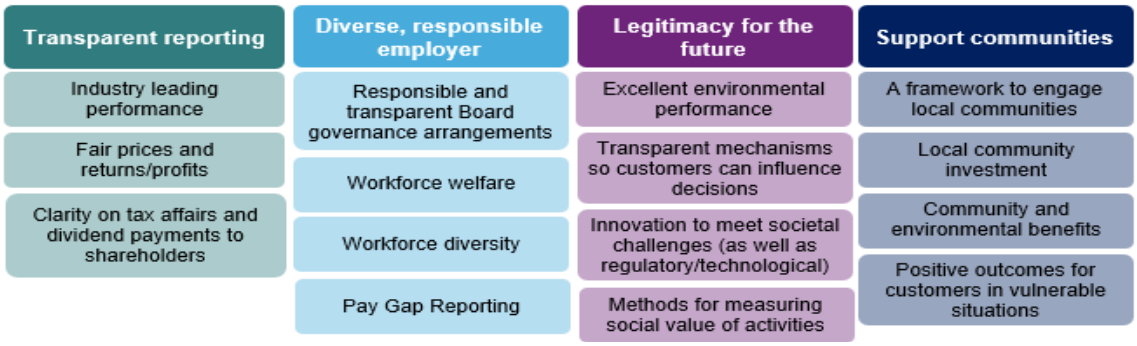

Figure 4.9 Our Social Contract key focus areas

Our social contract core commitments for RIIO-ED2

Provide transparent reporting (with clarity on returns and profits)

4.103 WPD is currently B rated on an Environmental, Social and Governance (ESG) which is the highest ranking of any energy company in the UK.

4.104 In RIIO-ED2 we will:

- Publish annual accounts in a simple, easy to understand format, setting out our total expenditure, the impact on customer bills and actual regulatory returns.
- Gain external audit and assurance of our annual accounts, including oversight from WPD's RIIO-ED2 Business Plan Delivery Challenge Group
- We will gain independent, annual ESG assessment and target a minimum of a 'B' rating every year.

4.105 ESG criteria are a set of standards for company operations that can be used by socially conscious investors to screen potential investments, and by wider stakeholders as assurance of a company's ethical approach. The ESG Corporate Rating covers more than 5,000 international and national companies.

- The environmental criteria are useful to assess WPD's performance on environmental issues.
- The social criteria consider how WPD manages relationships with customers, employees, suppliers and the wider communities in which it operates.
- The governance aspects deal with WPD's leadership, executive pay, audits, internal controls and shareholder rights.

Figure 4.10 Environmental, Social and Governance diagram

Core Commitment 21	**Publish annual reports in a simple, easy to understand format, setting out WPD's total expenditure, the impact on customer bills and regulatory returns.**

Core Commitment 22	We will, as a minimum, maintain our prime Environmental, Social and Governance (ESG) rating from a recognised agency.

Demonstrate WPD is a diverse, responsible employer

4.106 In RIIO-ED2 we will:

- Produce a Diversity & Inclusion Plan which states our aims and performance in this area.

Evidence the legitimacy of our operations for the future

4.107 In RIIO-ED2, we will:

- Ensure full compliance with the Financial Reporting Council (the UK's audit regulator) code for corporate governance.
- Adhere to six principles covering 1) purpose and leadership; 2) board composition; 3) director responsibilities; 4) opportunity and risk; 5) remuneration; and 6) stakeholder relationships and engagement.
- Regularly update WPD's standards of management and articles of association, subjecting them to external scrutiny and review.
- Train all WPD's directors and non-executive directors annually.
- Invite CEG Chair to attend company board meetings to provide independent oversight.

Play an active role regionally, and support vulnerable customers

4.108 In RIIO-ED2, we will:

- Achieve the Social Value Quality Mark – a stamp of approval for businesses committed to achieving positive social impact through their work.
- Conduct annual stakeholder engagement events to seek feedback on WPD's RIIO-ED2 delivery performance, identify areas of emerging stakeholder interest and concern and track changes in customer expectations.
- Conduct annual social value research to capture the full extent of social value created by our initiatives and identify opportunities to increase efficiency and deliver even stronger benefits and outcomes for customers.
- Work in collaboration with the other DNOs and Gas Distribution Networks to continue to apply common definitions and methodologies to measure, record and report social value in a consistent way, enabling customers and stakeholders to make meaningful comparisons.

4.109 We will also play an active role regionally and support vulnerable customers. We will:

- Support 300,000 people in our communities through our annual £1m 'Community Matters' fund to help vulnerable customers across our region.
- Establish a staff volunteering scheme encouraging staff to volunteer at local community projects. We will allocate 1,000 staff volunteering days every year during RIIO-ED2.

Core Commitment 23	Support local people in our communities via a £1m annual 'Community Matters' fund.

Core Commitment 24	Provide staff with paid leave for 1000 volunteer days per year to support local community initiatives associated with vulnerability and environmental initiatives.

Maintaining a safe and resilient network

General network performance

4.110 In RIIO-ED1, we placed great emphasis on improving network performance and are committed to continuing with this focus in RIIO-ED2. This is more important than ever at a time when home working has become much more widespread.

4.111 Our network is made up of a huge number of interconnected overhead lines, underground cables and substations. Many of these assets were installed during the 1950s and 1960s and some even earlier. We have a rolling programme of work to replace those assets in the poorest condition which will continue in RIIO-ED2.

4.112 Our stakeholders continue to place network reliability as a top priority. Power cuts cause inconvenience to businesses, services (such as hospitals) and domestic life. These inconveniences have become amplified during the recent COVID lockdowns. That is why we are committed to making sure our network is reliable and that faults are resolved quickly.

4.113 Faults can be prevented through routine activities such as inspection, maintenance, defect repairs and tree clearance. During severe weather, the network has to withstand more extreme conditions which is why we carry out more extensive measures such as resilience tree clearance to prevent damage from falling trees, and flood protection to reduce the impact of flooding on consumer supplies.

4.114 While network reliability is important, safety remains our top priority. We carry out regular activities to ensure the network is safe for our staff and the public. Our inspection programmes identify defects with potential safety implications allowing these to be resolved quickly. We also carry out improvement work such as upgrading security at substations and – as part of our proposed RIIO-ED2 programme – we will be reducing the risk of overhead lines adjacent to schools and play areas.

WPD's reliability performance RIIO-ED1

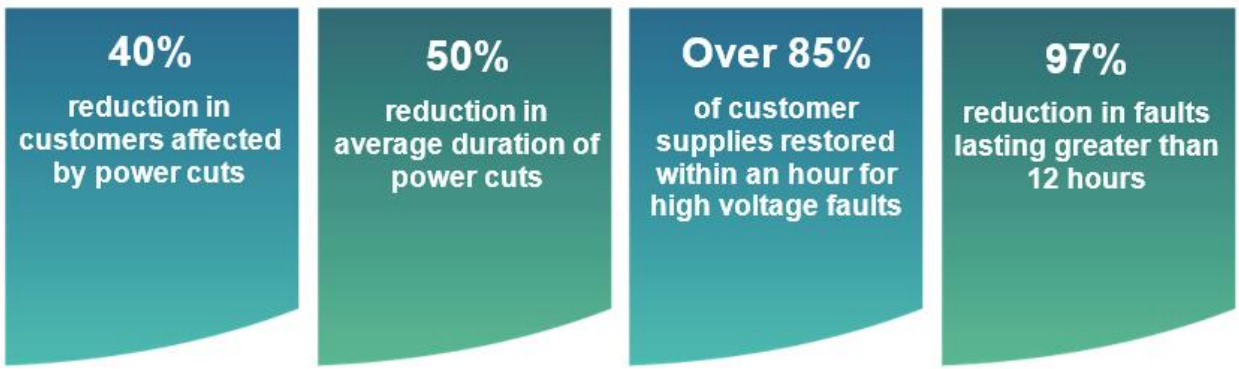

Figure 4.11 Highlights of our reliability performance during RIIO-ED1

Our network performance commitments for RIIO-ED2

What our stakeholders said about the network performance

Stakeholder Top Priorities	
1	Create accurate forecasting models and ensure that assets can respond to future (higher) demand
2	Continue maintenance and replacement programme for ageing assets (ensure sufficient resources to do so)
3	Maintain quality of supply in light of asset health and the growth in demand
4	Invest in the network to make it more resilient for worst-served customers
5	Maintain the health of 'at risk' assets and link your scenario planning to this
6	Communicate more focused, location specific scenario planning and make this information accessible
7	Use long-term climate scenarios (1:100 years is no longer fit for purpose) and work with housing developers and utilities to mitigate risk
8	Explore innovative ideas for flood defence and invest in these
9	Underground cables where appropriate

Figure 4.12 Stakeholder top priorities for Network Performance

Reducing the number of faults

4.115 As the network ages and deteriorates, the number of faults will increase, if no intervention takes place. Our investment is targeted at preventing faults from happening.

4.116 We will undertake a range of activities aimed at ensuring we provide a reliable supply to our customers. These activities include:

- inspecting, maintaining and repairing our assets to keep them operating
- replacing or refurbishing deteriorating assets
- removing defective poles from the network within a year of being identified as defective, to ensure timely removal of those poles that would be susceptible to failure
- completing tree clearance programmes to reduce the likelihood of branches and windborne debris affecting our overhead lines
- adopting highly accurate measurement techniques to identify the need for tree clearance more effectively
- providing adequate network capacity (either through traditional solutions or new flexibility services) to prevent damage to assets from overloading

4.117 As a result of these programmes, we predict that the number of faults will continue to fall during RIIO-ED2.

Core Commitment 25	**On average fewer and shorter power cuts in RIIO-ED2 than RIIO-ED1**

Target tree clearance

4.118 We have invested in Light Detection and Ranging (LiDAR) equipment for our helicopter fleet. LiDAR uses lasers to measure distance, providing an accurate measurement between overhead line conductors and vegetation. This data is being used to provide better information about tree infestation, including both distance to conductors and infestation levels along the overhead span.

4.119 During RIIO-ED1, we are changing our contractual arrangements for tree clearance. These previously relied upon the contractors to manage clearance requirements. Under the new arrangements and through the use of LiDAR, we can instruct the contractors to clear specific spans, prioritising those in greatest need.

4.120 This approach is expected to make overall routine and tree clearance on the HV and EHV networks more efficient, as well as improving the effectiveness of resilience tree clearance, where we clear trees within falling distance of the line. This improved management of clearance will lead to a reduction in tree-related faults. As a result, progressive improvements of 1% a year have been applied to HV and EHV overhead fault rates.

4.121 In RIIO-ED2, we are also committed to completing our resilience tree programme which involves a more rigorous tree clearance close to our EHV overhead lines.

Core Commitment 26	**Reduction of tree-related faults on HV and EHV overhead network due to use of LiDAR in RIIO-ED2, thus reducing the impact on the customer.**

Reducing customers interrupted per fault

4.122 As well as taking steps to reduce the number of faults, we have been installing remotely controlled devices and automation technology to reduce the number of customers affected when a fault occurs.

4.123 The installation of additional remotely controlled devices allows electricity supplies to be quickly rerouted without the need to send a person to site. These switching operations can be initiated by staff in our control centre or triggered automatically by computer algorithms.

4.124 Additional equipment to protect the network, such as circuit breakers and intelligent fuses, enables circuits to be subdivided into smaller zones reducing the number of customers affected by a fault.

4.125 The development of automatic switching algorithms allows switching actions to take place without the intervention of a control engineer. The algorithms use information from fault passage sensors to identify which section of the network contains the fault and then communicate with remotely controlled devices to restore supplies to the maximum number of customers possible.

4.126 During RIIO-ED1, we have targeted protection zones with more than 1,500 customers. In RIIO-ED2, we propose to address protection zones with more than 1,000 customers. In most cases, this will involve adding an extra remotely controllable device into those zones to increase the number of customers that can be restored automatically.

Getting the lights back on

4.127 We are committed to restoring supplies quickly and promote a culture which prioritises customers and the need to get them back on supply. A clear management focus on speedy restoration of electricity supplies in the event of a fault, whether it affects a single customer or thousands of customers, has led to significant improvements in restoration times.

4.128 Our internal 'Target 60' initiative measures the percentage of customers restored within one hour when a high voltage (HV) fault occurs. During RIIO-ED1, we pledged to achieve a Target 60 performance above 85% and have been successful in achieving this.

4.129 For RIIO-ED2, we will aim to improve on our performance by striving to restore supplies linked to a HV fault for 86% of customers (who are not automatically restored) within one hour.

Core Commitment 27	**Continue to have focus on restoring HV supplies quickly and aim to restore more than 86% of customers (that are not automatically restored) within one hour.**

12 Hour Guaranteed Standard

4.130 While our aim is always to restore power as quickly as possible, we occasionally deal with more complex faults where quick restoration is not possible. However, we will do everything that is safe and practical to get the power back on within a maximum of 12 hours.

4.131 During RIIO-ED1, we have significantly reduced the number of interruptions lasting over 12 hours. As a result, we have reduced the number of customers off supply for more than 12 hours from 10,748 in 2012/13 to only 270 in 2019/20

4.132 This has been achieved through management focus, technology, resource availability, fast response and, where necessary, deployment of mobile generation to provide temporary supplies.

4.133 We will continue working to minimise the number of customers off supply for 12 hours or more.

Core Commitment 28	**We will aim to restore customer supplies in RIIO-ED2 within 12 hours under normal weather conditions.**

Reducing the number of Worst Served Customers

4.134 A small proportion of customers experience high numbers of faults. These customers are generally located on the end of long rural circuits or on remote parts of the network, with limited alternative networks available to provide supplies when faults occur.

4.135 In RIIO-ED1 Worst Served Customers are defined as those who experience 12 or more, 11kV or higher interruptions over a three year period, with a minimum of three in each year. In 2019/20, there were approximately 6,900 worst served customers across the four WPD licence areas.

Number of Worst Served Customers (19/20)				
West Midlands	East Midlands	South Wales	South West	WPD Total
2498	69	1511	2792	6870

Figure 4.13 Worst Served Customer numbers for year 2019/20

4.136 The worst served customers suffer higher numbers of faults for a variety of reasons. By addressing some of the causes of these faults or reducing their impact, the overall network performance can be improved. This may be through the reconfiguration of the network, the replacement of poor condition overhead lines, the

undergrounding of overhead lines, the refurbishment of circuit components or the installation of additional switching points and protection zones.

4.137 While most of the solutions address the underlying cause of the faults, some call for additional protection devices to reduce the impact of faults, particularly where protection is applied to spurs which prevent faults affecting the rest of the circuit.

4.138 The solutions adopted to improve our service to these worst served customers will be determined following analysis of each of the affected circuits.

4.139 In RIIO-ED2, we are committed to delivering a minimum of 50 schemes across our area to improve supply reliability for our worst served customers with a particular focus on vulnerable customers.

Core Commitment 29	**Carry out 50 schemes improve network reliability for 5900 of our Worst Served Customers (those experiencing 12 or more higher-voltage power cuts over a 3 year period).**

Replacement of assets to enhance network performance

4.140 We have a rolling programme of asset replacement to prevent the deterioration of the network over time. The replacement of assets, such as transformers, overhead lines and cables, is prioritised according to the condition of the asset and the risk to the network if it fails.

4.141 Network Asset Risk Metrics (NARMs) are used to calculate the future risk associated with an asset over a number of years and to prioritise those assets which need to be changed. NARMs are applied to approximately two thirds of the asset replacement programme and inform the scale of asset replacement activity in RIIO-ED2. Other techniques are also used to forecast requirements including survivor (age based) modelling; bespoke programmes addressing specific issues, such as availability of spares, and historical trending where previous volumes of activity are used as a reasonable indicator of future needs. In some cases, we use data from a number of sources to determine the forecast levels of activity.

4.142 The asset replacement activity in RIIO-ED2 will maintain the overall health of the assets (as measured by the risk metrics). The benefits of this activity will broadly offset the degradation of the wider network.

Core Commitment 30	**Invest £190m per year to improve the overall health of the network and develop a measure of overall asset health. Report annually to stakeholders on the impact of our investments.**

Resilience to severe weather

4.143 Storm conditions can have a detrimental effect on supplies. During severe weather, broken poles on our overhead network can make it very difficult to get the power back on as well as tying up resources while repairs are carried out. That is why we have continued with our pole replacement programme to identify deteriorating poles and ensure these are removed quickly from the network.

4.144 Extreme weather can also cause severe flooding which poses a risk to our assets and impairs our ability to keep the lights on. To mitigate this, we have proactively installed flood defences at a number of substations which are at greater risk of flooding.

4.145 We have also carried out resilience tree clearance on strategic EHV circuits to prevent trees falling onto lines during high winds. We have also applied enhanced equipment specifications, installing lightning diverters to limit the impact of lightning strikes on overhead lines.

4.146 In RIIO-ED2, we will:

- Continue to replace defective poles within 12 months of identifying them.
- Seek to complete resilience tree clearance on the EHV network.
- Install further flood defences at 95 sites to reflect updated data from the Environment Agency.

Core Commitment 31	**We will continue to install further flood defences at 95 sites to reflect updated data from the Environment Agency.**

Network safety programme

4.147 Stakeholders expect us to operate a safe network. We ensure that inspection programmes are completed on time and respond quickly to safety-related defects. We identify safety issues though routine inspection of our sites and assets. Our inspection processes are designed to identify defects related to safety or performance. Safety defects are rectified using a risk based timescale; we track the completion of these defects to ensure that the risks are removed from the network. As these processes are effective and well-established, we have no plans to change them.

4.148 In RIIO-ED1, we have enhanced the security measures at all primary substations, installing electric fences in higher risk areas. We do not anticipate significant levels of expenditure on substation security during RIIO-ED2.

4.149 However, we are proposing a new area of work, which involves undergrounding or diverting overhead lines crossing school play areas. This follows an incident in the West Midlands where an oak tree caused an overhead line to fall onto an unoccupied playground. Our proposals will help us to remove risks of this kind and improve the safety of children and staff at schools. We have surveyed all the schools in our region and ranked them according to risk; we plan to carry out work at all schools and other play areas where the risks are deemed to be medium or higher.

Cyber security resilience

4.150 The much publicised 'WannaCry' ransomware cyber attack in 2017, and introduction of the European Union's Directive on security of Network and Information Systems (NIS) in 2018, led to WPD placing a greater emphasis on cyber security. WPD set-up a dedicated cyber security team in 2019 initially focusing on the areas recommended in the National Cyber Security Centre '10 steps to cyber security', before working to become NIS compliant. This team now provides a variety of security controls and services throughout the business.

4.151 Our stakeholders have an increased interest in cyber security and an awareness of the important role it plays in ensuring the continuity of electricity supplies. Stakeholders particularly asked for assurances that we would:

- Take the appropriate mitigating and corrective actions to identified network vulnerabilities
- Create and maintain well tested incident recovery plans
- Collaborate and work with third party experts, including those in government to identify threats

4.152 Continuing to deliver cyber secure, reliable and resilient business systems is a key part of the RIIO-ED2 Business Plan.

4.153 The network and information systems and technologies used to operate the electricity network are categorised as either business Information Technology (IT) systems or Operational Technology (OT). IT systems are traditional computer and telecommunications systems and applications. Expenditure in this area ranges from purchasing new PCs to maintaining IT equipment and communications equipment. OT is technology that communicates and interfaces with business systems and physical assets and includes systems such as our communications system which allows us to interact remotely with sensors and monitors on the physical distribution network.

Protecting our systems

4.154 As reliance on systems and technology has increased, so unfortunately has the volume and sophistication of cyber attacks from exploiters such as nation states, organised crime and hackers. In turn this has increased the risk of a possible future security breach to the electricity distribution network via its systems. It is now more essential than ever that we protect our IT systems and data from the threat of cyber attacks which could cause significant network disruption together with associated financial and reputational damage. Detailed plans and processes are also required to be able to respond and recover in the event of a cyber-attack.

4.155 To protect customers from the threats posed by cyber attacks, the Network and Information Systems (NIS) directive came into force in 2018. This directive and its recommended standards must be adhered to by operators of essential services and has resulted in a number of changes to the way we secure, maintain, support and operate our systems.

4.156 Our approach to cyber security in RIIO-ED1 was initially reactive, relying on traditional security products and services such as anti-virus and physical firewalls. We also championed three core IT security principles to mitigate against many known security threats:

- No internet access from desktop PCs
- No cloud hosted systems
- No bring your own devices

4.157 To meet the requirements of stakeholders and ensure that controls and processes are in place to mitigate the risk of any future possible cyber attack, we have adopted the NIS directive as our benchmark standard along with cyber security principles.

4.158 To ensure NIS compliance and to manage the evolving IT cyber security risks we plan to extend the size and scope of the existing Cyber Security team before the end of RIIO-ED1 to include dedicated OT cyber security resource.

Figure 4.15 Cyber Security Principles

Our cyber security IT resilience Core Commitments for RIIO-ED2

What our stakeholders said about the cyber resilience

Stakeholder Top Priorities	
1	Understand where your network may be vulnerable and work to put up barriers that will prevent access
2	Ensure all systems, procedures and processes are up to date
3	Keep up to date on emerging threats and hacking techniques
4	Increase your focus on network security to increase your resilience
5	Create, maintain, and test your incident recovery plans
6	Collaborate and work with third party experts, including those in Government to identify threats
7	Share best practice with your partners and collaborate with other networks

Figure 4.14 Stakeholder top priorities for cyber resilience.

4.159 Initiatives planned for RIIO-ED2 include:

- Further developing our cyber security risk model as the threat landscape changes
- Supporting the business from a security perspective in the trial and development of new technologies, system integration and digitalisation
- Working with third parties such as the National Cyber Security Centre, to ensure our systems remain security compliant
- Ensuring all systems are kept up to date with the latest operating system versions and security patches
- Embedding cyber security principles and controls into the supply chain
- Continuing to raise awareness and the profile of cyber security within the business
- Upgrading our disaster recovery capability

Core Commitment 32	**Continually assess emerging threats to enhance cyber security systems to ensure no loss of data or network interruption from a cyber attack.**

Our cyber security OT resilience core commitments for RIIO-ED2

4.160 Delivering cyber secure, reliable and resilient Operational Technology (OT) is a key requirement of the RIIO-ED2 business plan as networks become increasingly more digitised, interconnected and at risk of a cyber security attack.

4.161 Our establishment of a Distribution System Operator function calls for the development of more efficient and smarter networks to manage power flows across the distribution network.

4.162 As a result of the changing use of the electricity network, traditional boundaries between IT, OT and customer-owned devices are also changing to become more interconnected. This has led to an increase in the number of end-points (PCs, smart meters, Remote Terminal Units) that we have to maintain and secure.

4.163 Our approach to cyber security in RIIO-ED1 has been primarily focused on IT. Investment to date in OT cyber security controls has been proportionate as the OT cyber security attack risk and threat level has been perceived to be relatively low.

4.164 Publicised OT cyber attacks, such as the 2016 Crashoverride attack against several Ukrainian power companies, raised the profile, understanding and the risk and threat level of OT cyber security attacks. This played a part in the implementation of the NIS directive, which has seen us placing a greater emphasis on OT cyber security.

4.165 The work carried out so far by the newly established cyber security team has initially focused on IT security but is now being expanded to include more OT focused activities. A number of the initiatives planned or already in progress are set to be completed before the end of RIIO-ED1. The cyber security team is also working alongside Distribution System Operator function, the core IT team as well as the telecoms team to deliver a standardised common approach to cyber security within WPD, as all of these functions need to work together in the most secure environment possible.

Core Commitment 33	**Enhance the resilience of our IT network security by upgrading our disaster recovery capability to ensure continuity of our operations.**

4.166 As well as taking into account cost, resilience and reliability, when implementing new technology delivery platforms, it is also critical to consider security and risk appetite. We use a model which rates risk, based on a set of cyber security benchmarks and the criticality of the system. Cyber security controls such as logging and monitoring are then applied accordingly, based on the risk rating.

4.167 The detailed forecast for the RIIO-ED2 OT cyber resilience plan has been built on:

- Identifying NIS long-term goals/requirements
- Understanding IT cyber security best practice and how this is applied in the OT environment
- Understanding what tools and technologies are required for our Distribution System Operator activities
- Identifying critical national infrastructure related telecoms components and ensuring they are fit for purpose
- Incorporating new initiatives to improve business functionality and effectiveness
- Identifying opportunities for making efficiency savings
- Working with the National Cyber Security Centre and other third party security specialists to establish best practice

Workplace and public safety

4.168 The safety of our employees, contractors and the general public is of paramount importance. Our aim is that no harm is caused to anyone who is either involved with, or affected by, our activities or apparatus.

4.169 During RIIO-ED1, we have worked hard to maintain a safety performance which remains among the best in the industry and which has led the company to significantly outperform national workforce safety statistics. The 2019/2020 average incident rate for workplace injuries across all industries is 2,160 per 100,000 workers while at WPD, the rolling 12 month average incident rate is 732 per 100,000 employees.

Our safety core commitments for RIIO-ED2

What our stakeholders said about safety & health

Stakeholder Top Priorities	
1	Ensure the mental health needs of the workforce are being met, and supported by promoting a healthy work-life balance
2	Ensure that managers commit to leading by example
3	Reach out to schools to inform children about the safety hazards that surround WPD assets
4	Undertake bi-annual or annual meetings with stakeholders to share best practice
5	Ensure contactors comply with similar health and safety standards to WPD
6	Undertake 'wellbeing at work' assessments
7	Further support the development of champions in mental health
8	Maintain regular staff training for staff on driving new vehicles, and when logging key information on site visits

Figure 4.16 Stakeholder top priorities for Safety and Health

4.170 During RIIO-ED2, we will build on the improvements already made in RIIO-ED1 to:

- Reduce further the health and safety risks associated with our activities:
- Continue to comply fully with all health and safety legislation.
- Build on the programme of health and safety interaction developed during RIIO-ED1, including training programmes, Health and Safety conferences and independent audits.
- Continue to provide information to members of the public, including children, making sure they have the knowledge they need to keep themselves safe around the electricity network.

Maintaining a safe, healthy and motivated workforce

4.171 For our staff, the main focus area will be to build upon the strong safety culture which was acknowledged in their feedback to our independent Safety Climate Survey in 2019. We will continue to look for opportunities to enhance this established safety culture.

4.172 The hazards associated with an electricity network require strict controls to minimise the risks to those who work on it. The use of bespoke equipment designed and built to strict standards must be complemented by appropriate information and training. We have an in-house training team that delivers craft training, operational training and specialist training for those working on the network. We are also developing new training schemes to address the safety challenges linked to the adoption of Distribution System Operator techniques and practices.

4.173 We are constantly looking at ways to improve the effectiveness of this training and will review the content of all our bespoke training courses during RIIO-ED2 to ensure these cover all the elements needed to keep staff safe.

4.174 During RIIO-ED2, we plan to retain our place as a leading safety performer by reducing our average Accident Frequency Rate (AFR) by an additional 10%, on our RIIO-ED1 performance.

4.175 Following the success of our first Safety Climate Survey in 2019, we will conduct a second survey and follow this up with discussion workshops across the business. Trade Union safety representatives will provide enhanced feedback and review the results of the survey and any comments received.

Core Commitment 34	**Undertake an additional staff Safety Climate Survey during RIIO-ED2.**

Improving communication of health and safety related information to staff and contractors

4.176 We actively participate in and lead many national working groups and initiatives related to health and safety. We will continue to co-operate with our peers to influence and promote improved practices across the whole industry through initiatives such as the Electricity Networks Association's Powering Improvement and the Health & Safety Executive's Helping GB Work Well programmes.

4.177 Throughout RIIO-ED2, we will continue to deliver conferences to staff and contractors to promote and share safe working practices and lessons learned from recent events. We will invite independent experts to provide advice and information, linking to our own safety action plan.

4.178 We will continue to work with our contractors to ensure that safety remains a key priority and that their safety performance is monitored by appropriate site safety visits and contractor audits. We will share learning from safety issues at regular review meetings to influence improvements in safety performance.

4.179 We have a comprehensive library of documents that are shared with staff and contractors to highlight the hazards associated with working on or near the distribution network, as well as measures to control the risks associated with these hazards. During RIIO-ED2, we will review all of our health and safety documents and ensure the advice and instruction they provide is both clear and effective.

4.180 Effective communication is important to ensure that staff and contractors understand health and safety related information. During RIIO-ED2, we will continue to review the way in which we communicate health and safety information to ensure we deliver effective, engaging material for both staff and contractor organisations using the most appropriate means of communication.

Safety of the general public

4.181 We know that members of the public may become exposed to the dangers of electricity because they are not fully aware of the hazards involved and that this can lead to serious injury or death. We provide information and education to minimise the risks.

4.182 In RIIO-ED1, we have:

- Distributed 540,000 safety leaflets to date
- Educated over 375,000 children about electrical safety
- Installed enhanced security at over 700 substation sites

4.183 Our stakeholders have told us that our priorities for RIIO-ED2 should be to:

- Maintain a focus on health and safety.
- Consider the safety impact of new and emerging technologies before they are connected to the networks.
- Ensure that we continue to raise awareness of the dangers of electricity to the general public.
- Ensure our assets remain fit for purpose.

Provision of information to members of the public

4.184 We believe that, by providing information and education about the hazards associated with electrical apparatus, we can reduce the number of incidents and the number of people who suffer injury from electricity. Throughout RIIO-ED2, we will continue to provide leaflets and information to members of the public and landowners. We plan to deliver safety related information to over a million customers by distributing safety literature and making greater use of social media to reach an even wider audience.

4.185 During RIIO-ED2, we will continue to collaborate at a national level to remind people in other industries and businesses of the dangers of working close to electrical networks. Safety information will be provided in the form of videos, social media messaging, posters and media campaigns as well as in safety leaflets. We will also issue advice to groups or organisations whose members may be at greater risk as a result of carrying out activities close to our equipment.

Core Commitment 35	**Distribute 200,000 safety advice information per year to stakeholders.**

4.186 Our education programme provides information and education to children and young people, to alert them to the dangers of electrical equipment. We will build on the achievements of RIIO-ED1 by extending our programme to reach a further 60,000 school age children per year during RIIO-ED2. This will be achieved through school visits, sessions at our five permanent Safety Centres, Crucial Crew events alongside other emergency services, and our presence at popular, family exhibitions and shows.

Core Commitment 36	**Educate a minimum of 60,000 children per year about avoiding danger from electricity.**

Removal of hazards from school playing areas

4.187 Our programmes of inspection, maintenance and refurbishment keep overhead lines in good condition and our work on overhead line clearances ensures that overhead lines are of a sufficient height above ground. This means that there is generally a low risk of failure and exposure to hazards.

4.188 However we recognise that storms can cause damage to overhead lines and that children may not be aware of the hazards. For this reason we are proposing a new area of work, which involves undergrounding, insulating or diverting overhead lines that cross school play areas.

Core Commitment 37	**Underground, insulate or divert 780 overhead lines that cross school playing areas.**

Compliance with health and safety law

4.189 We will install, inspect and maintain our assets in line with best practice and to ensure they comply with all health and safety regulations, continue to operate safely and do not expose anybody to avoidable danger.

4.190 We will continue to work with the Health and Safety Executive to prevent accidents and promote safe working practices, both for our own staff and the contractors who work with us.

Workforce resilience

4.191 We believe that our success as a company is due to the talents and commitment of our staff. At WPD, we work collaboratively with Trade Unions to create a working environment where staff are empowered to develop, progress and flourish.

4.192 Our operational workforce consists of geographically based teams responsible for all activities in that area, complemented by a range of support staff. We operate a flat management structure which means there are only three management layers between a team manager and a director. This structure makes decision-making and problem solving much quicker and empowers employees to act within an agreed framework of authority.

4.193 A typical licence area consists of a Network Services Manager (NSM) overseeing network operations, and six to eight Distribution Managers (DMs) responsible for between four and eight Team Managers (TMs). The TMs look after day to day activities such as maintaining existing assets, planning and delivering network improvements, responding to faults and providing new connections. Their teams are made up of craftspeople and operators, technicians, planners, engineers and specialists, and team support staff.

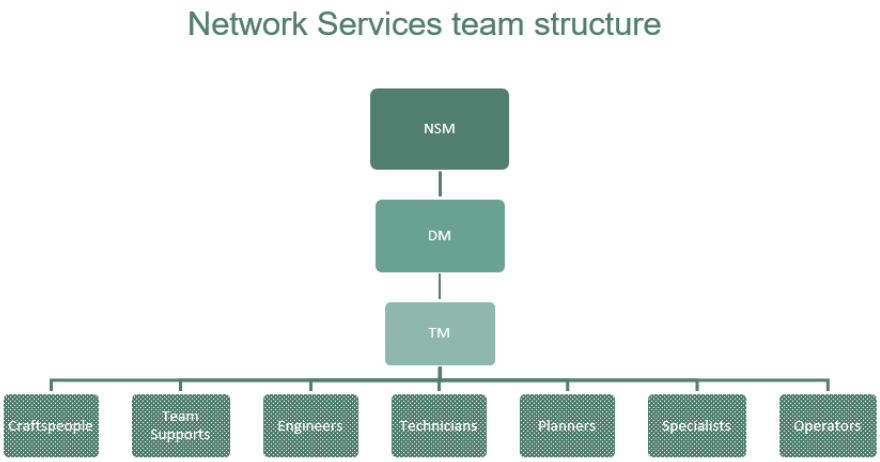

Figure 4.17 Network Services' team structure

4.194 The team structure is supported by corporate functions such as employee relations, finance, information technology, communications, and payroll and pensions, among others. The team ethos is based on minimal layers of management with local issues being resolved locally.

4.195 At the start of RIIO-ED1, our total workforce was 6467 employees and this has remained almost unchanged. The average age of staff members is 41.5 years. During this period, our staff turnover rate has averaged 4.26% a year which is slightly higher than in previous years due to a higher proportion of natural wastage during RIIO-ED1.

Some highlights in RIIO-ED1 include:

- Our ratio of male/female staff has changed due to an increase of 150 female employees across many roles.
- While 2019 statistics from Women in Science and Engineering indicate that the percentage of women in the Science, Technology, Engineering and Mathematics (STEM) workforce has dropped, we are bucking this trend by recording a steady increase.
- We have also increased staff from ethnic communities, adding a further 22 employees from ethnic minority groups.
- Our apprenticeship and trainee intakes over the period amounted to 713 employees including 78 internal trainees.

Our workforce resilience core commitments for RIIO-ED2

What our stakeholders said about the workforce resilience

Stakeholder Priorities	
1	Provide flexible working packages and other incentives that suit the whole working demographic including sabbaticals, time of in lieu, and flexible retirement plans
2	Create an age-inclusive environment that accommodates different working practices between generations
3	Provide emotional support to build trust amongst staff
4	Provide clear, whole-career, and personalised development pathways for staff that enable progression through WPD
5	Equip managers with skills to empower other staff and implement personal development programmes
6	Develop a flexible, resilient workforce prepared for new roles and ways of working in the future
7	Improve outreach to schools
8	Evaluate how WPD reaches out to younger people ready for employment

Figure 4.18 Stakeholder top priorities for Workforce Resilience

4.196 As we move into RIIO-ED2, we will continue to build on our existing principles:

- Our people are our company
- We will be recognised by the actions of our people
- Our people exhibit our behaviours and values

4.197 We will continually review and identify opportunities to manage and motivate our loyal, valued and resilient workforce to deliver results and meet future challenges.

4.198 Many of these challenges – such as the changing energy markets and carrying out Distribution System Operator's functions - will call for new and additional skills among our workforce. We will ensure we have these skills both by recruiting externally, and by training and upskilling our existing employees.

4.199 We have developed three priority areas as part of our Workforce Resilience Strategy.

Priority 1: Promote WPD as a stand out employer in the UK

4.200 We recognise that we will need to develop the existing talent in our workforce, as well as attracting new skills and talent from across the UK to WPD, in order to deliver our commitments in the changing electricity sector.

4.201 We will promote WPD wherever we can to increase our attractiveness as an employer and establish WPD as 'a great place to work'. This message will be incorporated into our wider activities, including our work in schools and colleges, at community events, and as part of our careers programme. We must also ensure that our culture and business style remain attractive to new and existing employees from all communities.

4.202 We are mindful that mental health is a huge concern in work places across the UK. We have initiated training in mental health awareness for both managers and Trade Union representatives, along with a mental health policy and procedural guidance to support this training.

4.203 We have trained more than 300 middle and senior managers in mental health awareness to act as mental health first aiders, along with 11 Trade Union representatives. We plan to train more Trade Union representatives as well as employees who have a desire to support mental health in the workplace

4.204 We will achieve the Investors in People award, gaining at least silver accreditation. This will provide independent verification of our employment practices and show potential employees that they will be joining an employee-focused company which will be benefit their career.

Core Commitment 38	**Demonstrate exceptional embedded employment practices by achieving a minimum of silver accreditation with Investors in People by the end of RIIO-ED2.**

Priority 2: Improve and increase the diversity of our workforce

4.205 We want to create a workplace in which employees from a diverse range of cultures and backgrounds feel 'at home'.

4.206 During 2020, our CEO launched WPD's 'Respect Charter', confirming our commitment to working together and outlining our aim to:

- Be professional and act with integrity
- Promote and champion fairness and inclusion for all
- Respect and value differences
- Treat everyone with courtesy and respect

4.207 WPD also signed up to the "Dying to Work" Charter, in collaboration with the Trades Union Congress and GMB Union, which details how we will support, protect and guide employees following a terminal illness diagnosis.

4.208 During RIIO-ED2, we are committed to continue to be an inclusive, respectful and diverse employer that rewards performance, enables professional development and encourages employee engagement, and where everyone is treated fairly and with respect and dignity.

4.209 Our proposed actions for diversity and inclusion will help us work towards accreditation at a national standard.

Core Commitment 39	**Publish annually our updated Diversity and Inclusion Action Plan and performance.**

Figure 4.19 Workforce Resilience Strategy

Other workforce resilience priorities in RIIO-ED2

- We are committed to promoting wellness in the workplace
- We are committed to reviewing working arrangements to allow for more flexible and agile working, which will attract a more diverse workforce
- We will continue to provide a competitive employment packages, benefits and career opportunities that attract candidates from diverse communities, using salary and benefits benchmarking within the sector
- Our target for staff absence is that it should be below an average of four days per employee a year

Workforce resilience plan for RIIO-ED2

4.210 We forecast that our staff numbers will increase by 99 during RIIO-ED2. This will enable us to respond to the increased uptake of low carbon technologies which will call for increased network reinforcement and a growing emphasis on data to meet the expectations of our stakeholders

4.211 We will need to further embrace the “digital culture” in RIIO-ED2.That means we will need to recruit a range of positions to support our data architecture. We will also need trained staff to engage directly with local authorities on their net zero carbon ambitions and community energy initiatives.

Delivering decarbonisation and an environmentally sustainable network

Our environmental strategy

4.212 We are committed to environmental sustainability and actively support the government's 2050 net zero target. We believe in minimising our impact on the environment and are striving to reduce our own business carbon footprint (BCF).

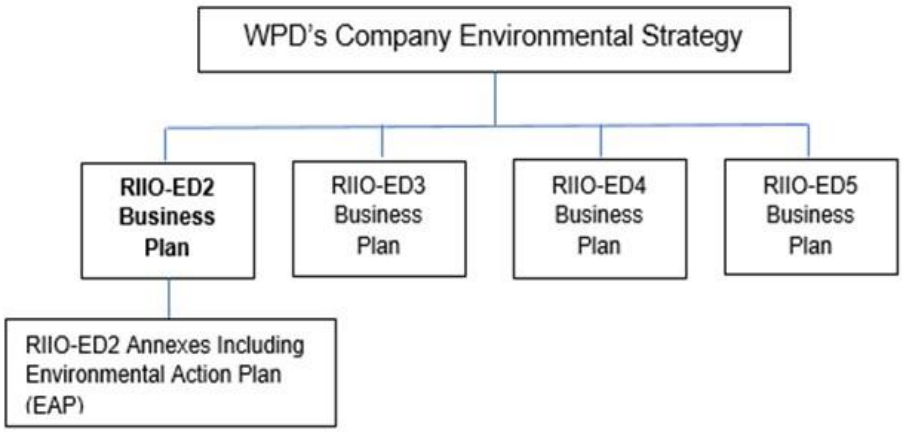

Figure 4.20 Environmental Strategy structure

4.213 We strongly believe that, as an energy company, we should act as a role model by reducing our BCF and inspire others to follow our lead. We have a social obligation to respect and protect the environment in which we operate. This is a view that is firmly supported by our stakeholders.

4.214 During RIIO-ED1, we moved towards a more proactive, performance driven approach, managing the impact of our business activities on the environment. So far, we have achieved the following environmental business plan outputs:

- 12% reduction of our Business Carbon Footprint
- 78% reduction of the tonnage of waste being sent to landfill
- Reduction of 55% in fluid leaked from fluid filled cables
- Reduction of SF_6 gas leaks outperforming our 17% reduction RIIO-ED1 target
- We have replaced 29km of overhead lines in National Parks and Areas of Outstanding Natural Beauty so far and are on track to achieve our target of 55km by the end of RIIO-ED1

4.215 For RIIO-ED2, WPD's Environmental Strategy details our commitment to becoming a net zero carbon organisation and to ensuring that environmental responsibility remains a key part of all of our activities into RIIO-ED2 and beyond.

4.216 In addition to WPD's Environmental Strategy, we are producing our Climate Change Strategy.

Our environmental core commitments for RIIO-ED2

What our stakeholders said about the environment

Stakeholder Top Priorities	
1	Set a target for zero carbon emissions from your fleet, for example, by 2030
2	Replace smaller vehicles with EVs and larger vehicles with biogas or hydrogen
3	Monitor all transport associated with your business, using telematics, to reduce the number of miles travelled
4	Eliminate the use of SF_6 and carry out research to find alternatives
5	Use science-based targets to improve biodiversity, aiming for a net gain
6	Put in an ambitious tree replacement programme and promote this good work
7	Ensure buildings are powered by renewable energy
8	Reduce the use of single use plastics

Figure 4.21 Stakeholder top priorities for the environment

Becoming a net zero carbon organisation

4.217 We are committed to becoming a net zero carbon organisation ahead of the UK government's 2050 target. We will set Science Based Targets to monitor and ensure our progress towards this goal. To meet this target, we will:

- **Reduce our Operational Business Carbon Footprint (BCF).** Our annual BCF takes into account the associated carbon emissions from a number of our business activities including the emissions from our operational transport fleet, the energy used in our buildings and electricity substations, releases of SF_6 (sulphur hexafluoride) – a greenhouse gas used as an insulator by manufacturers of electrical switchgear - and the impact of journeys taken by those on company business. Throughout RIIO-ED2, we will broaden the scope of our annual BCF to include carbon emissions linked to waste management and additional indirect emissions. By reducing our BCF (not including network losses), we will remain on track to be a net zero carbon business before 2043.

- **Set Science Based Targets:** We will engage with the Science Based Targets (SBT) initiative to ensure that our SBTs are valid and effective. We will not only limit the impact on global carbon emissions and achieve a SBT but will also reach net zero (including network losses) by 2043, seven years ahead of the UK government's target date. A carbon emissions target is defined as science-based if it is in line with reductions needed to keep the global temperature increase below 2°C above pre-industrial temperatures

- **Measure embodied carbon.** Embedded carbon is the carbon footprint of a material or a product. It takes into account how much greenhouse gas is released throughout the supply chain and is often measured over the entire life cycle of a product or service. During RIIO-ED2, we will work collaboratively to measure the embodied carbon associated with our major projects as well as a number of our key operational activities.

- **Reduce our network losses.** Alongside our own operational BCF, we also report the carbon emissions associated with our network losses. These must be accounted for in any SBTs to which we commit.

4.218 We are committed to ensuring our activities do not have a harmful impact on the environment in which we operate - a standpoint shared by our stakeholders. In RIIO-ED2, we will reduce waste, support biodiversity, reduce leaks from network equipment, share best practice and work collaboratively with other DNOs and organisations

4.219 We recognise the importance of significantly reducing our BCF. For this reason, we will deliver the following actions in by the end of RIIO-ED2 to reduce our Business Carbon Footprint to become net zero by 2043.

Core Commitment 40	**Reduce internal Business Carbon Footprint to be net zero by 2043 by following a verified Science Based Target to limit the climate impact of our activities.**

4.220 To becoming a net zero carbon organisation by 2043, we will:

- Install LCT generation at all suitable depots and offices to produce electricity to meet operational demand
- Purchase all building energy from a renewable source and account for this in our reported Business Carbon Footprint
- Reduce energy use in our buildings
- Ensure that all new WPD buildings achieve an 'Excellent' BREEAM rating
- Replace a minimum of 79% of our existing operational fleet with electric vehicles by 2028
- Cut carbon emissions from our operational fleet by 50%
- Install electric vehicle charging infrastructure at all our operational sites
- Include only non-carbon technology cars in our company car scheme by 2025
- Reduce business travel by encouraging more remote working and virtual meetings

Core Commitment 41	**Replace 79% of our transport fleet by 2028 with non-carbon technology where practical.**

Core Commitment 42	**Install renewable local generation at all suitable offices and depots.**

Being environmental responsible

Developing our Environmental Action Plan

4.221 Our RIIO-ED2 Environmental Action Plan (EAP) sets out our ambitions to meet our stakeholders' net zero expectations, by reducing our environmental impact.

4.222 The EAP also outlines our goal to decarbonise our business operations and significantly reduce our own business carbon footprint (BCF) by committing to the Science Based Target (SBT) Initiative and contains further details on our planned environmental actions.

Protect the local and regional environment from the release of harmful substances

4.223 We take the environmental impact of substances used on our network very seriously and makes every effort to prevent releases into the environment. Stakeholders asked us to set a target for RIIO-ED2 to further reduce leaks and to monitor their environmental impact. During RIIO-ED2, we will:

- Proactively inject all fluid filled cables that have significant leaks on our network with perfluorocarbon trace a benign chemical that allows quick location and repair of leaks
- Boost our effectiveness when dealing with fluid filled cable leaks by improving response and taking intervention action at an earlier stage
- Reduce fluid filled cable network leaks by 30% compared to RIIO-ED1
- Replace 70km of the poorest performing 132kV and Extra High Voltage fluid filled cables on our network
- Adopt any new technologies, where appropriate, to support the ongoing proactive management of our fluid filled cable
- Continue with non SF_6 switchgear installation (where suitable alternatives are identified at all voltage levels)
- Focus on replacing our poorest performing switchgear which is prone to leakage
- Remove all polychlorinated biphenyls (PCBs) contaminated equipment from our network by 2025. PCBs are now known to be highly toxic industrial compounds which during legacy manufacturing processes have led to contamination of some pre-1989 transformers and a small range of other equipment.

Core Commitment 43	**30% reduction network leaks by fluid filled cables from RIIO-ED1.**
Core Commitment 44	**Replace over 70km of the poorest performing Extra High Voltage fluid filled cables (FFC) on our network.**
Core Commitment 45	**10% reduction in SF_6 losses from that in RIIO-ED1.**
Core Commitment 46	**All PCB contaminated equipment will be removed from the WPD network by 2025.**

Protect the local and regional environment from damaging by our activities

4.224 During RIIO-ED2, we will ensure that our activities have minimal negative impact on protected flora and fauna species. We will also commit to working with Wildlife Trusts on the selection and implementation of a suitable tool to enable us to assess the impact of new projects with a view to enhancing biodiversity.

4.225 By the end of RIIO-ED2, all new major infrastructure projects and new connections will have a biodiversity enhancement plan. This will be based on a natural capital assessment of the elements of the landscape that will be directly or indirectly impacted as a result of the work we will be doing

4.226 These assessments will target species and habitats identified as being 'at risk' by Wildlife Trusts and consider the actions needed to reduce Nitrogen Oxides (NOx, reduce noise pollution and mitigate against the impacts of climate change.

4.227 Over the course of RIIO-ED2, this will lead to:

- A cleaner environment
- Less disruption from cable repairs and clean-up operations
- Reduced carbon emissions
- Improvements to biodiversity
- A healthier, more stable and sustainable ecosystem

4.228 We will liaise with Natural England & Natural Resource Wales regarding our work at Sites of Specific Scientific Interest (SSSIs) to ensure we do not adversely affect our country's heritage.

Monitor our use of resources and reduce waste

4.229 Throughout RIIO-ED1, we have significantly reduced the amount of waste sent to landfill. During RIIO-ED2, we will continue to improve our management of waste and resources. We will work with our suppliers through the procurement tender process to reduce the environmental impact of the products and services we use. We will do this by eliminating unnecessary packaging materials, obtaining recyclable packaging and introducing manufacturer 'take back' schemes, as well as working with manufacturers to increase the durability of packaging materials.

4.230 We will also investigate opportunities to turn waste materials into a resource for third parties. By the end of RIIO-ED2, no WPD waste will be routinely sent to landfill for disposal. At the same time, we will reduce the tonnage of waste per £1m of annual expenditure by 20%.

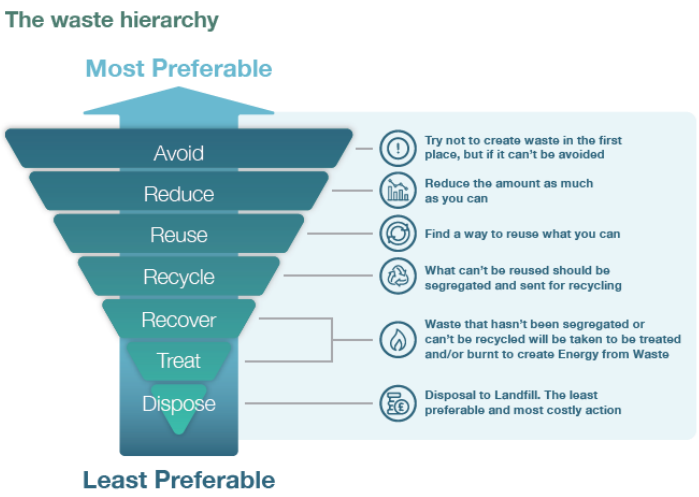

Figure 4.22 Waste hierarchy

4.231 We currently produce 3.2 tonnes of waste per £1m annual turnover (2019/20 figures). By the end of RIIO-ED2, we will reduce this by 0.64 tonnes (20%) to 2.56 tonnes of waste per £1m of annual turnover. We'll achieve this by avoiding waste production and by reducing it, where it cannot be avoided altogether.

Core Commitment 47	**20% reduction in tonnage of waste per £ total annual expenditure.**

Core Commitment 48	**Reduce waste to landfill to 10% (excluding hazard waste).**

4.232 Another key focus will be on stakeholders' requests for us to move away from single use plastics and to use more reusable and recyclable products. We will work with our manufacturers and suppliers to source more goods made from recycled plastics, eliminate plastic packaging and non-recyclable plastics in favour of more suitable materials.

4.233 Benefits to the customer will include:

- Reduced societal burden from waste
- Reduced use of raw materials
- Reduced carbon emissions
- Sustainability, reducing environmental impact from operations

Removing targeted overhead lines in National Parks and Areas of Outstanding Natural Beauty (AONBs)

4.234 We have always been committed to working with the organisations responsible for National Parks and AONBS. For RIIO-ED2, we will aim to remove 8km every year and have therefore set ourselves a target of 40km in total.

Core Commitment 49	**We will target removal of 40km of overhead lines in Areas of Outstanding Natural Beauty.**

Losses

4.235 We are committed to reducing losses associated with our network and we have published a Losses Strategy which is available on our website at https://www.westernpower.co.uk/smarter-networks/losses

4.236 There are two types of losses:

- **Technical Loss:** The amount of energy that enters an electricity network is greater than the amount that is delivered to customers. The principal reason for this is that an electricity network uses energy in the process of delivering power.

- **Non-technical Loss**: Other reasons for electricity losses are where a connection has been made to the distribution network without authority (known as theft in conveyance), where metering equipment has been deliberately by-passed (known as illegal abstraction) or where a connection has not been properly registered and no supplier is assigned. The energy used in these circumstances is not metered and does not feature in volumes registered by suppliers. As a result, it is shown as a loss on our network.

4.237 In RIIO-ED2, we are committed to building to delivering further reductions in a number of areas by:

- Continuing to invest in the most efficient and low loss transformers in line with the EU Eco Design Regulations. Losses from these are 40% lower than with traditional transformers
- Installing cables with larger cross sectional areas, as standard - we will use 300mm^2 low voltage cable, replacing the use of 185mm^2 (larger cable cross section areas allows easier power flow from one end to the other and therefore reduce losses)
- Discontinuing the use of smaller transformer sizes on our overhead line networks and removing 25kVA single phase and 50kVA three phase units from our traditional range. Larger transformers mean that losses are reduced as a result of lower energy loss in the transformer core.

Core Commitment 50	**Where a low voltage mains cable is required it will be a minimum size of a 300mm^2 cable and for the smallest pole mounted transformer size will be 50kVA single phase to reduce technical losses.**

4.238 In RIIO-ED2, we will continue to work in collaboration with electricity suppliers and other authorities to further reduce electricity theft and illegal abstraction.

A Smart and Flexible Network

4.239 The full details of our activities associated ensuring that WPD has a smart and flexible network is covered in Chapter 5 Delivering a Smart and Flexible Network. However we have summarised our core commitments in this section.

What our stakeholders said about a smart and flexible network

	Stakeholder Top Priorities
1	Flexibility is viewed by stakeholders as a key part of the provision of network capacity as load grows on the network
2	Information should be clear and enable domestic, commercial and community customers to understand how they can participate in providing flexibility services. WPD must, therefore, work to facilitate network flexibility and educate end-customers.
3	In order to best support our customers' planning and unlock innovative approaches to decarbonisation, stakeholders want us to provide clear, simple and easy access to high quality data.
4	Stakeholders believe that sharing data could facilitate and encourage collaboration, resulting in more efficient outcomes for customers.
5	Collaboration with other utilities and companies within the energy industry is viewed as hugely important by stakeholders in order to arrive at the most effective and efficient solutions.
6	Stakeholders expect WPD's collaboration with others, particularly with local authorities, will help to identify areas of growth can be accurately identified.
7	By acting as a facilitator to bring together the many parties involved in emerging energy service markets, stakeholders believe WPD could make customer participation in flexibility services easier and cheaper.

Figure 4.23 Stakeholder top priorities for a smart and flexible network

Our smart and flexible network core commitments for RIIO-ED2

Procuring flexible services

4.240 We have established processes for procuring and using flexible services as an alternative to conventional network reinforcement.

4.241 We have established a registration process for participation in the market and procurement cycles that provide multiple opportunities for flexibility providers to tender their services. There is a weekly process for identification of when flexibility services will be required, an automated platform for dispatching flexibility and transparent published rules about payments for the services provided.

4.242 While we have been at the forefront of developments across the industry, we want to build on these during RIIO-ED2 to make sure they are seen as simple, fair and transparent.

4.243 To ensure that the processes that we have implemented are working correctly and giving flexibility provider the opportunity to engage with the market, we will introduce a customer satisfaction survey to identify opportunities for further improvements.

Core Commitment 51	**Create and implement simple, fair and transparent rules and processes for procuring flexibility services and introduce a customer satisfaction monitor to measure the effectiveness of our actions.**

Signposting and forecasting flexibility requirements

4.244 WPD has established two stages of notification of future network constraints: signposting provides a longer term (five year) indication of network constraints using a range of future energy scenarios; and forecasting is a shorter-term (up to two year) view of requirements based upon greater certainty of requirements.

4.245 The forecasting process links with the procurement process which has tender rounds every six months. This means that there are at least three opportunities for flexibility providers to consider whether they can provide services for the specified network need.

4.246 Having established these processes, they will be continued into RIIO-ED2 to ensure that there is the greatest opportunity to identify flexibility providers to offset the need for conventional reinforcements.

Core Commitment 52	**Produce forecasts of potential flexibility requirements in order to undertake a flexibility tender every 6 months.**

Neutral market facilitation

4.247 WPD recognises that the development of a neutral market for provision of flexibility is important for participants to be confident that they will be treated fairly.

4.248 Our approach to being a neutral market facilitator is to be open and transparent about the rules of engagement and decisions that are made.

4.249 We are transparent about the needs of the network with the data that we publish about network constraints, transparent about pricing structures, transparent about contractual arrangements and transparent about how we will dispatch flexibility. We have also established a separate process to make our decision making as independent as possible

4.250 While we believe that we act in a neutral way, we want to ensure that market participants share our confidence. That is why we propose to work with third parties to establish an approach for carrying out external scrutiny the way we operate the flexibility market.

Core Commitment 53	**Develop a standard to be measured against (using external scrutiny) to demonstrate that we act as a neutral market facilitator to enable accessibility to multiple markets.**

Assessing alternatives to conventional reinforcement

4.251 WPD has adopted a flexibility first approach to considering how it will resolve network constraints.

4.252 Where constraints are identified we use the Signposting and Forecasting processes to give flexibility providers clear picture of requirements. These processes are carried out before conventional reinforcement would need to start and therefore help identify whether there is sufficient flexibility available to resolve a network constraint.

4.253 This approach ensure that we consider a flexible alternative for every network constraint.

4.254 We propose to continue with this approach refining the process and identifying more ways of encouraging third parties to consider providing flexibility services.

Core Commitment 54	**100% load related reinforcement (primary) decisions include an assessment of flexibility alternatives.**

Flexible connections

4.255 To connect new consumers to the network existing capacity may need to be increased in order to allow the customers to use the amount of load or export their full generation output. These connecting customers fund a proportion of these costs based on their requirements.

4.256 The work to increase capacity may be extensive, take a long time and be costly to the connecting customer. Through a range of innovation projects and trials, WPD has adopted flexibility connection options allowing connections to be made more quickly and at a lower cost with the agreement that the connection capacity may be curtailed during periods of high demand on the network.

4.257 Active Network Management (ANM) allows control systems to interact with the customers' equipment to manage the load. The infrastructure to allow ANM is being rolled out across all areas during RIIO-ED1, which means that all future customers will be able to benefit from this form of flexible connection.

Core Commitment 55	**Ensure that connection offers with a reinforcement requirement are given an Active Network Management (ANM) option.**

Evolution of flexible connection options

4.258 WPD has developed two main types of flexible connections: Active Network Management requires the most complex arrangements including direct communication with the connection to manage load; and time profiled connections where output is only permitted during certain periods of time based on historical assessment of network loading.

4.259 We will continue to develop these options for making flexible connections and seek to develop further options.

Core Commitment 56	**Increase to three types of options for flexible connections.**

Enabling Low Carbon Technologies to connect

4.260 Decarbonisation of transport, heating and electricity production will lead to more electric vehicles, heat pumps and distributed generation. Many of these low carbon technologies will be connected at lower voltages, making it necessary to ensure that there is sufficient capacity for the LCTs to connect.

4.261 WPD will be proactive in identifying parts of the network that are heavily loaded and providing more capacity. We will use smart meter data, increased amounts of network monitoring and enhanced analysis to identify where network reinforcement is required. We will also look at ways in which the LCTs loads can be managed to make greatest use of existing network capacity, which may involve steps such as controlling when electric vehicles are charged.

4.262 Together these proactive actions will enable more LCTs to connect.

Core Commitment 57	**Make it as easy as possible for our customers to connect LCTs, such that WPD connects more than the national average of LCT connection volumes in the UK (prorated by our number of customers).**

Sharing network data

4.263 As networks become smarter, and more data is collected and processed, there are greater opportunities for third parties to make use of the data for their own purposes or to develop new ways of managing the networks.

4.264 The Energy Data Task Force has promoted the concept of presumed open data. WPD has been developing ways of making more network data available to third parties and the Energy Data Hub on our website currently allows various data sets to be accessed.

4.265 We propose to continue to expand the range of data available as well as developing the systems for accessing this information. We are looking at ways of cataloguing and organising the data to enable users to define their own specific requirements and extract user specific datasets. We anticipate that this access will be made through Application Programming Interfaces.

Core Commitment 58	**Improve the volume of data available by 60% via an interactive, API (Application Programming Interface) relative to all data made available (e.g. via spreadsheets and fixed format reports).**

Understanding data needs of stakeholders

4.266 WPD has a strong track record of engaging with stakeholders to ensure that the services we provide meet their needs.

4.267 As we expand the data we make available and the processes for accessing the data, we must ensure that we are meeting the needs of stakeholders. We therefore propose to introduce a satisfaction survey to support our engagement interaction and provide some quantitative analysis of the service we are providing. This will enable us to identify areas of opportunity and focus on specific improvements that will benefit the greatest number of users.

Core Commitment 59	**Introduce a customer satisfaction monitor to measure data availability, ease of access and usefulness, improving from the baseline throughout RIIO-ED2.**

Producing and using Distribution Future Energy Scenarios (DFES)

4.268 Since 2015, WPD has been producing and publishing Distribution Future Energy Scenarios (DFES) documents, which forecasts the volumes and regional distribution of low carbon technology uptake in our region. DFES are key to our continual assessment of the distribution network, helping us to identify and forecast network constraints.

4.269 These constraints are used with flexibility procurement markets and decision processes to determine what actions will be taken on the network. These will feed into a Distribution Network Option Analysis process which will determine the most cost effective approach to providing capacity on the network.

4.270 This analysis will inform the plans included in our Long Term Development Statement and Network Development Plan to be published during RIIO-ED2.

4.271 We are committed to updating the DFES each year so that we can use the latest information to inform our plans.

Core Commitment 60	**Using data from updated Distribution Future Energy Scenarios and stakeholder insight to publish a Long Term Development Statement and a Network Development Plan annually.**

DFES stakeholder input

4.272 As part of the DFES process, we speak to local authorities about their ambitions for local developments and net zero related aspirations. Engaging with local authorities provides a two-way communication channel. It enables WPD to understand the local plans and factor these into knowledge about network constraints and it allows the local authorities to understand some of the consequences of their proposals and to refine their own Local Area Energy Plans.

4.273 Interaction with the Electricity System Operator allows WPD to provide an input into the national Future Energy Scenarios (FES), by providing more detailed information about local developments. It also allows a greater understanding of the assumptions behind the FES.

4.274 Together these approaches to engagement allow the DFES to be refined and be more representative of likely future network needs. We therefore propose to engage regularly with stakeholders to help to improve the DFES analysis.

Core Commitment 61	**Engage with stakeholders and the Electricity System Operator every two years to update WPD's Distribution Future Energy Scenarios for all four licence areas.**

Local Authority Surgeries

4.275 Local authorities are required to develop Local Energy Action Plans (LAEPs) to identify the changes they need to make to achieve net zero targets. The varying range of experience and resources among the 130 local authorities in the WPD region and this means that different local authorities are progressing at different rates in the development of their LAEPs.

4.276 Some authorities require greater interaction in order to understand where developments can take place, what constraints may arise from their proposals and how their strategies may impact the network.

4.277 To assist them with their plans, we propose to hold dedicated surgeries where more detailed discussions can take.

Core Commitment 62	**Hold 30 Local Energy Surgeries per year for local authorities, supporting them to develop their local energy plans.**

Whole system collaboration

4.278 The changing use and operation of the network is impacting the whole electricity system and the move from gas to electricity leads to changes across energy sectors. This means that development of the network needs to be viewed in a wider context to ensure that the most efficient and effective solutions are adopted for customers.

4.279 WPD has worked with National Grid during RIIO-ED1 to carry out collaborative assessments of network requirements with the South West, which has led to greater utilisation of flexibility to manage constraints on both the distribution and transmission networks.

4.280 We anticipate that there will be further whole system challenges that will emerge during RIIO-2, some which may be initiated by transmission or other DNOs. We propose to work collaboratively to ensure that network issues are resolved by determining the best solution.

Core Commitment 63	**Undertake two whole system collaboration schemes with other DNOs and the ESO by 2028.**

Innovation

What our stakeholders said about innovation

Stakeholder Top Priorities	
1	Stakeholders believe that WPD is well-placed to lead the way with innovation, helping to facilitate change across the industry
2	They were clear that WPD must act on stakeholder feedback and lobby for change in order to avoid the issues that have occurred in previous national projects e.g. the smart meter roll out.
3	While being an industry leader, WPD should strive to collaborate with both the wider energy industry and other industries altogether
4	Stakeholders want to see us support companies and individuals to develop innovative projects, and to work with major energy users to develop intelligent solutions to reduce current demand.
5	Stakeholders have suggested that innovation research and case studies are a great vehicle to communicate opportunities for collaboration with partners
6	WPD should prioritise publishing research and projects (both successes and failures) to foster a dialogue with potential partners

Figure 4.24 Stakeholder top priorities for innovation

Using innovation to benefit customers

4.281 WPD has been very active in carrying out innovation work for more than 10 years. This has led to the development of a number of new processes and ways of managing the network that are now incorporated within our business as usual activities. In many cases, a number of innovation projects have contributed to the evolution of these new processes.

4.282 We want to ensure that the innovation work that we carry out is seeking to provide a benefit or enhancement. For this reason we carry out a cost benefit assessment to identify the potential benefits of an innovation projects. This may be a bespoke benefit arising from the project or a benefit that contributes to a wider innovation challenge.

Core Commitment 64	**For each innovation project we will undertake a cost benefit assessment and implement into business practice to improve efficiency and effectiveness of assets, operations and customer service.**

Innovation ideas portal

4.283 Because we recognise that we do not have all the answers, we work with third parties on innovation projects. We also recognise that we do not have all the best ideas and hence we capture innovation ideas by running calls for projects. These calls are run at different times of the year, where we ask individual or organisations to submit proposals for specific topics.

4.284 During RIIO-ED2 we will develop a new interactive ideas portal aimed at staff, third parties, communities and other stakeholders who can make suggestions for new projects. Where appropriate, we will make small grants to individuals or groups to help progress an idea through feasibility assessment and the creation of a high level project scope.

Core Commitment 65	**Develop an interactive 'innovation ideas portal' aimed at stakeholders submitting ideas for new innovation projects.**

Community Energy

4.285 Community energy is the delivery of community led renewable energy, energy demand reduction and energy supply projects with the underlying objective of addressing climate change. These projects may be are wholly owned and/or controlled by communities or through a partnership with commercial or public partners. Community projects deliver collective social, environmental and economic benefits to the local community such as fuel poverty alleviation, energy engagement and education, and community funds from renewable energy projects

What our stakeholders said about community energy

	Stakeholder Top Priorities
1	Stakeholders identified supporting community energy projects as one of the highest priorities for WPD in relation to driving innovation and new services
2	Community energy groups state they are often interested in developing low carbon technologies renewable connections but tend to be slow to react to opportunities around flexibility, which stakeholders felt WPD should try and influence
3	Stakeholders raised the importance of WPD providing education and support, as some groups may lack the knowledge and expertise in relation to the energy network
4	Stakeholders discussed the importance of community energy projects as a base for innovation extensively, especially as it was felt that this could benefit a lot of people and would also help to share knowledge and information
5	In particular stakeholders would like to see projects developed specifically to ensure community energy schemes benefit from Ofgem's Innovation funding mechanisms
6	As well as supporting the low carbon transition, stakeholders can see a role for community energy schemes to help address fuel poverty, with community energy champions able to advise their neighbours as they will be trusted and can build on the existing relationship

Figure 4.25 Stakeholder top priorities for community energy

Community Energy Surgeries

4.286 We have provided support to the communities and their representatives through accessible guides. Our 'Connecting Community Energy' guide is a 'how to' for any local energy group looking to develop its own renewable energy project and connect to our network.

4.287 Some organisations prefer to discuss matters in more detail with our engineers which is why we will implement Community Energy Surgeries involving our local teams. These allow us to engage more closely with groups at the start of their journey and provide guidance on how best to connect to the network and operative efficiently and effectively.

Core Commitment 66	**Hold 30 Community Energy Surgeries per year for local Community Energy groups.**

Innovation for Community Energy

4.288 To help community and local energy organisations develop new business models, and to help us understand how we might best manage a decarbonised and decentralised electricity system, we have partnered with communities on several network innovation projects.

4.289 We will continue to look for opportunities to work with community energy groups on new innovative ideas.

Core Commitment 67	**Establish dedicated innovation projects for Community Energy schemes.**

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Chapter 5

Delivering a smart and flexible electricity network

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5. Delivering a smart and flexible electricity network

Summary

5.1. We understand we have a critical role to play in ensuring our network can support the growth of low carbon technologies (LCTs) throughout the RIIO-ED2 period and beyond. This will be a time of huge change across the whole energy sector as the UK works towards achieving a net zero carbon future.

5.2. We are already committed to investing up to £90m to support the green recovery by the end of the current price control period. This investment will start to help to ensure capacity is available for new technology and changing demand patterns. We will build on the processes we have established in RIIO-ED1, adapt to new ways of working and continue to embrace an evolving approach to the way we operate our network, including the increasing use of flexibility services.

5.3. This chapter outlines the activities we will be undertaking in response to these challenges and our commitment to do this as cost effectively as possible. We must ensure our network development encourages the connection of LCTs by making capacity available and also by providing access to our network data to allow stakeholders to develop their own strategies for a net zero carbon outcome.

5.4. We also need to ensure that we have a smart network that uses digital technology including monitoring equipment, communications networks and automated devices to actively analyse the network status and operate the network for optimised running arrangements.

Net zero by 2050

UK government net zero aspiration

5.5. In June 2019, the UK parliament passed legislation requiring the government to reduce the UK's net emissions of greenhouse gases to achieve a 100% reduction by 2050. In November 2020, the UK Prime Minister launched a 10 point plan laying the foundations for a Green Industrial Revolution. This was followed in December 2020 by an Energy White Paper from the Department for Business, Energy and Industrial Strategy, setting out a long-term strategy for the UK's energy system.

5.6. As part of this, the government wants to increase the number of electric heat pump installations from the current level of 30,000 a year to 600,000 a year by the end of 2028. There will also be a ban on the sale of diesel and petrol cars and vans by 2030 and hybrid vehicles by 2035, so the network will need to be ready for increased amounts of electric vehicle charging.

5.7. These changes will lead to a significant growth in the ownership of electric vehicles and heat pump heating systems across our region, calling for extra capacity to be made available on our network. This increased demand will add to existing network challenges posed by previous government incentives, which encourages a move away from centralised fossil fuel based electricity generation to more localised, renewable distributed generation.

Welsh government net zero aspiration

5.8. The devolved Welsh government has a slightly less stringent target of achieving 95% reduction in greenhouse gases by 2050. However, it has declared its aspiration to achieve net zero in Wales by 2050.

5.9. The Welsh government 'Prosperity for all, a low carbon Wales' document looks at all aspects of decarbonisation. It specifically seeks a whole energy system approach to meet its targets. Drawing on energy industry scenarios, it plots the route to achieve decarbonisation, including a reduction in travel requirements and increased use of public transport as key targets. The Welsh government has set a specific target to reduce the emissions of taxis and buses by 2028.

Local Area Energy Plans (LAEPs)

5.10. Local authorities are preparing LAEPs which are designed to introduce local actions that will contribute to UK net zero targets. Many local authorities have declared climate emergencies and are working on plans to reduce carbon emissions. Local plans for low energy housing, transportation, zero carbon heat, and industrial and commercial developments will influence the demand for electricity and, as a result, the requirements for our network.

5.11. We will assist local authorities to establish their comprehensive LAEPs and then use these plans to inform our future energy scenarios. These in turn influence the amount of network expansion and reinforcement that is required to meet local energy demands.

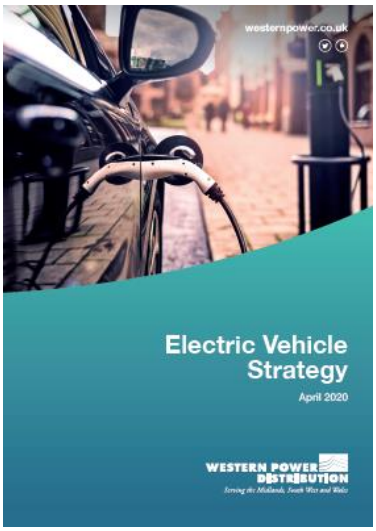
Low carbon technologies – EVs and heat pumps

5.12. During RIIO-ED1, there has been a significant growth of distributed generation connected to our network, fuelled by government incentives such as the 'feed in' tariff. This growth is creating new challenges for the network, such as the need to handle different power flows and provide sufficient export capacity. There are a range of other technologies being developed that will add to these challenges. Energy storage is increasingly used alongside generation to store excess power and release it to the network at a later point in time.

5.13. During RIIO-ED2 we anticipate further growth in distributed generation and storage, but, by far, the most significant changes will be associated with Electric Vehicles (EVs) and heat pumps.

Electric Vehicles (EV)

5.14. There is clear evidence that the popularity of EVs is growing – and is set to grow further. In December 2020, it was announced that the sale of new petrol and diesel cars and vans would end by 2030 – earlier than previously planned. The adoption of EVs is also being accelerated by the creation of local government clean air zones and by the availability of a wider range of EVs from manufacturers. Fears such as 'range anxiety' are also diminishing as more people use EVs.



5.15. Our EV Strategy describes the challenges we face to prepare our network for millions of electric vehicle drivers who will want to charge their EVs at a time and place that suits them. It also outlines the ways in which we plan to harness innovation and other solutions to meet these challenges. The strategy explains the rationale behind our innovation projects and initiatives, as well as how we are incorporating some solutions into our 'business as usual' activities.

5.16. It is available on our website at https://www.westernpower.co.uk/smarter-networks/electric-vehicles

Getting our network ready for EVs

5.17. Our customers' expectations are clear and simple. The infrastructure for EV charging requires high volumes of energy – and we need to be able to deliver that energy when and where it's needed. We will develop the infrastructure to charge vehicles at charging hubs, on-street and at people's homes.

5.18. EV charging will increase demand on the network and require more capacity to be made available, particularly on the low voltage network. That is why we are looking at smarter ways of charging which will enable us to incentivise when charging takes place (avoiding peak network use hours) and minimise the need for reinforcement.

5.19. EV batteries require energy for charging but also provide an opportunity to put power back into the network. We have been exploring the use of vehicle-to-grid technologies and are confident these will become part of the solution.

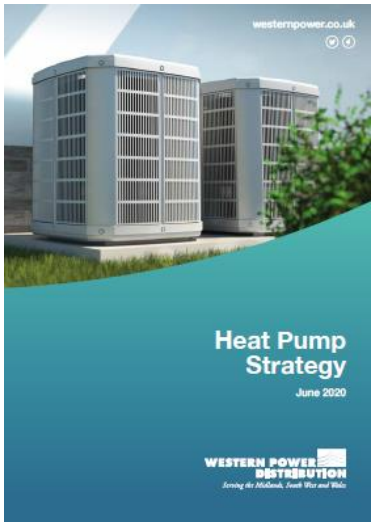
5.20. Motorway service areas are likely to see a significant change in electricity demands. As part of the UK government's Project Rapid, we are working with the government to model predicted demands at each service area. This expected demand is equivalent to the level of demand we would typically see in a small town.

Heat pumps

5.21. Heat pumps are a key part of the UK's plans to achieve net zero by 2050 - that's because more than one third of the UK's carbon emissions come from heating. In its 2020 Energy White Paper, the government announced its intention to increase the number of heat pumps being installed by 20 times to 600,000 each year by the end of 2028.

5.22. In 2020, we became the first DNO to publish a bespoke Heat Pump Strategy document. The strategy sets out how WPD will enable heat pump owners to connect to the network in a way that suits them, using innovation and other initiatives to make this happen.

5.23. It is available on our website at https://www.westernpower.co.uk/smarter-networks/heat-pumps



Getting our network ready for heat pumps

5.24. The biggest challenges when providing power for heat pumps will be linked to domestic properties, which may lead to service upgrades and capacity issues on the low voltage networks. In many cases, this will result in a need for network reinforcement as it is more difficult to control the times at which heat pumps are able to operate.

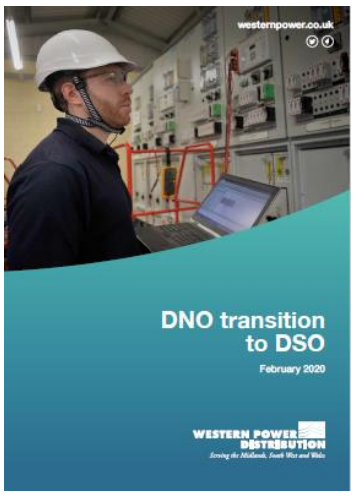
5.25. We will also consider different ways of storing heat and energy and whether these can be incorporated as part of the network solution for providing capacity.

Being a Distribution System Operator (DSO)

5.26. A DSO must create an efficient and more flexible electricity network to meet future energy demands as well as co-ordinating transmission and distribution services at a local level with other network and system operators.

5.27. We recognise the vital importance of Distribution System Operator status to drive network performance and efficiency and to ensure we can meet the future energy demands of all our customers.

5.28. As a result of this changing energy landscape, we have adapted our network - traditionally designed for 14GW of demand - so that it can now accept a total of 21GW of embedded generation. We have contracted with 440MW of flexibility services to provide network capacity in the most efficient way.



5.29. We were the first DNO to publish a costed DSO strategy in 2017; this has been updated every year to reflect changing requirements and industry developments. The latest version (February 2020) is available on our website at

https://www.westernpower.co.uk/smarter-networks/network-strategy/dso-strategy

5.30. As part of establishing a DSO function, we've been addressing the challenges of net zero while still ensuring the efficient running of our network and keeping costs affordable for our customers.

Smarter and flexible networks in RIIO-ED2

5.31. Plans for network reinforcement during RIIO-ED2 will begin with 'flexibility first'. This means that flexibility will be considered as an alternative to network reinforcement in all cases where network capacity needs to be increased. Where flexibility is an option, the procurement of flexibility services through six monthly cycles provides real insight into the scale and scope of its availability as an alternative to conventional reinforcement.

5.32. We are using our knowledge of flexibility gained during RIIO-ED1 to inform our forecasts for RIIO-ED2, ensuring our network can meet the capacity for LCTs and other connections, as well as continuing to operate efficiently. Our investment programme combines flexibility solutions with a need for conventional reinforcement where the scale of flexibility is limited and does not meet the requirements for additional capacity.

5.33. We have already changed our organisational structure to create a separate DSO management framework. This allows our network strategy teams to make more objective judgements when considering the best network investment options. This encourages a neutral market place for flexibility, where conventional solutions are used only after flexibility options have been considered.

5.34. We will continue to embrace the evolving use of flexibility, publish more data to stimulate further market developments and operate the network in a way that continues to provide consumers with a reliable, affordable and efficient electricity supply.

5.35. In our network planning, we have continued to develop processes to identify network constraints, seeking market-based solutions and making investment decisions which allow us to embrace alternatives to conventional network reinforcement. More transparent decision making is helping to develop the market by showing participants the reasons for decisions, and allowing them to amend their behaviour to benefit from the market, and to provide a wider range of services to network operators.

5.36. These changes are seen as a natural extension to the functions we already perform. That is why we firmly believe we are best placed to execute the Distribution System Operator role through RIIO-ED2 and beyond.

5.37. Through RIIO-ED2, our DSO teams will undertake three core roles:

- Planning and network development
- Network operation
- Market development

5.38. We have developed DSO functionality in all three areas and will continue to expand capability in these areas during RIIO-ED2. This will involve increasing data acquisition from the network, enhancing established processes, developing new systems and sharing more data.

Forecasting future electricity usage

Our process

5.39. Since 2015, we have been using Distribution Future Energy Scenario (DFES) reports, which from 2020 will be produced annually to forecast low carbon technology uptakes up to 2050. The DFES projections have been aligned to the latest National Electricity Transmission System Operator (ESO) scenario forecasts which are available when the DFES process is carried out.

5.40. A separate process called Distribution Network Options Analysis (previously Shaping Subtransmission) then determines the impact of the scenarios on the network. This process uses data from the DFES analysis to determine whether the change in network use will lead to network constraints.

5.41. The information about network constraints is used to engage with potential flexibility providers. 'Signposting' gives a longer term indication considering multiple scenarios for network requirements over the next five years while 'Forecasting' provides a shorter-term single scenario forecast over two years. This information is used in the flexibility procurement process which takes place over multiple cycles until investment is required.

5.42. The options for investment are considered in the Distribution Network Options Assessment (DNOA) process which determines whether flexibility, conventional reinforcement or alternative innovative approaches provide the most economical solution.

5.43. This will result in either the implementation of flexibility or conventional reinforcement, where flexibility is not practical.

5.44. The use of future energy scenarios and associated processes are embedded as 'business as usual' at WPD. Activities during RIIO-ED2 will focus on expanding, enhancing and evolving these processes.

5.45. There are three main stages involved in our strategic network planning process:

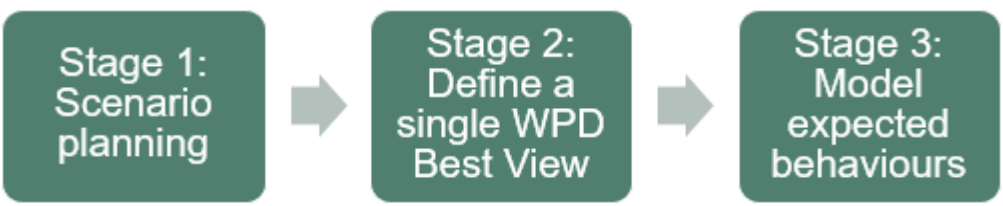


Figure 5.1 Strategic network planning process

Stage 1: Scenario planning – Production of Distribution Future Energy Scenarios (DFES)

5.46. The first stage of the strategic network planning process is creating the Distribution Future Energy Scenarios (DFES) which use national Future Energy Scenarios (FES) forecasts produced by the Electricity System Operator (ESO) and local information to provide a distribution view of the low carbon technology volume changes across DNO licence areas.

5.47. The scenario projections for each technology are given in quantifiable units – i.e. MW of installed capacity (for generation and storage) and number of heat pumps and electric vehicles.

5.48. The DFES is a key part of our continual assessment of the distribution network. The outputs from the DFES inform multiple business operations, including the electrical analysis underpinning our Shaping Subtransmission series of reports.

5.49. WPD has pledged to produce a full suite of DFES documents each year from 2020. This means there will be an updated suite of DFES documents for all licence areas by January every year throughout RIIO-ED2. This will follow the release of an updated ESO FES in the preceding July.

5.50. As part of our extensive stakeholder engagement programme, we invited all 130 local authority stakeholders across the WPD region to work with us to create a joined up energy plan. We will undertake this engagement again in the first quarter of 2021 to ensure that our forecast for RIIO-ED2 is as up-to-date as possible.

5.51. As a key element of this engagement we asked for the following data from the local authorities:

- General data based around a local energy strategy, declaration of a climate emergency and a target date to achieve net zero
- Availability and comparison of data sets
- Technology projections for electric vehicles, heat pumps, new industrial, commercial and domestic developments, generation including solar, wind and battery storage

5.52. As another important part of our interactions with local authorities, WPD Distribution Managers based at our local depots met with local authority energy representatives to review the assumptions and projections.

5.53. This resulted in a range of responses. Some local authorities were more ambitious than the DFES while others found the interaction helped them to formulate their LAEPs.

5.54. This feedback from local authorities has been used to refine the growth projections across our licence areas, making them more representative of local requirements and more likely to be used.

5.55. We will continue our interaction with the local authorities on a regular basis to feed into the annual review of WPD DFES scenarios, as well as using this data to feedback regional information into the ESO FES process.

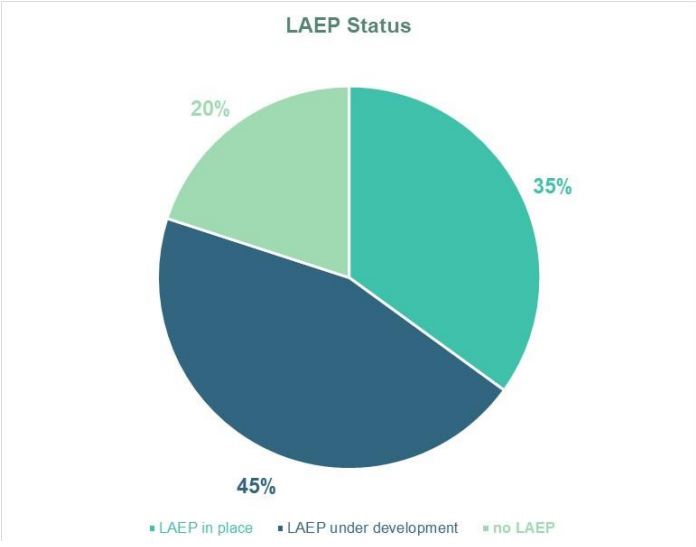


Figure 5.2 Status of Local Area Energy Plans

Stage 2: Defining a single WPD Best View

5.56. Following the creation of a series of scenario projections, we use these to produce a single WPD Best View.

5.57. To derive the WPD Best View, WPD uses an iterative process. DFES data and the Best View from the previous year is used to support stakeholder and Local Area engagement, which then allows the quality of Local Area Energy Plans to be assessed using criteria derived from Ofgem guidance to gauge the ambition, engagement and deliverability.

5.58. The assessment is carried out by WPD's senior regional managers, scoring against the criteria matrix resulting in local area specific DFES scenario being selected. The DFES scenario is chosen by closely comparing the ambition of the planned volumes across all technology types within the area, and then further ranked on how close this ambition is likely to be to the needs of stakeholders, the accuracy of the modelling is and the capability of the area to deliver. A single DFES scenario is currently chosen to approximately represent all technologies.

5.59. Before the WPD Best View is finalised, the licence area totals are checked against national ambition to ensure WPD targets are aligned to deliver governmental policy.

5.60. This allows the Best View to be presented at both DNO group level and at an aggregated level across our four licence areas.

Stage 3: Model expected behaviours

5.61. The process considers the MW impact, and the timing and diversity of the impact to identify where the growth will result in specific network constraints. The output is published in Shaping Subtransmission reports for each of the four WPD licence areas.

5.62. This is one example of the South West Shaping Transmission report. All four licence areas reports are available on our website at https://www.westernpower.co.uk/smarter-networks/network-strategy/strategic-investment-options-shaping-subtransmission

5.63. The constraints identified feed into WPD's longer–term 'Signposting' process for identifying long term flexibility requirements. To alleviate potential network constraints, both flexibility services and conventional reinforcement are considered among the investment options.

Using WPD's Best View for the RIIO-ED2 Business Plan

5.64. WPD's Best View scenario is processed in a similar way to the Shaping Subtransmission process.

5.65. The WPD Best View growth projections are tempered with extra characteristics that are included to account for future changes in consumer behaviour.

5.66. It is assumed that some of the projected growth will be offset by increases in efficiency. This will happen as a result of a gradual fall in the underlying demand and the expectation that new demand connecting to the network will be more efficient than the existing stock.

5.67. There is also an allowance made for pricing-led Demand Side Response (DSR). This assumes that market-led price signals (not initiated by WPD) will be utilised to avoid electricity usage at times of peak demand.

5.68. The forecast is based on three components: WPD Best View projected growth driving demand up and efficiency and pricing-led DSR reducing the impact of the demand growth. The projections show that future demand will be higher than current demand.

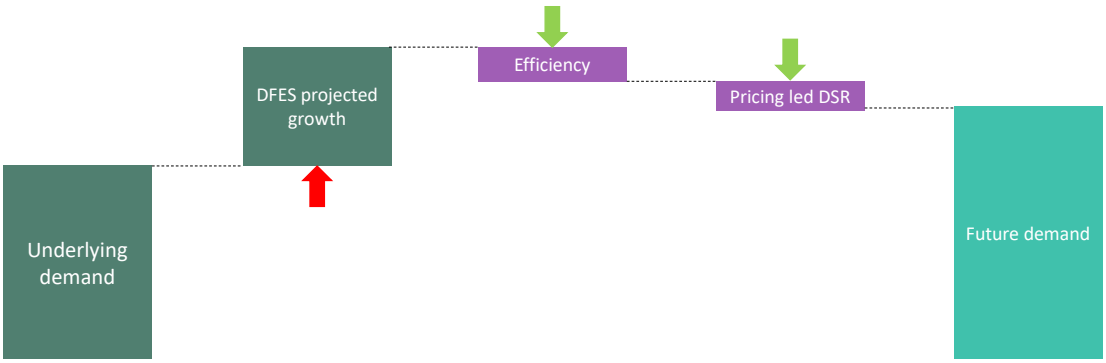


Figure 5.3 Components considered when calculating future demand

5.69. The results of this analysis are used to inform shorter term flexibility requirements in the Forecasting process for flexibility procurement cycles. They also help to create projections of network reinforcement requirements for the RIIO-ED2 period found in this Business Plan.

5.70. The following tables summarise some of WPD's high level figures from the calculation of the WPD Best View for each licence area at the start (2023) and the end (2028) of RIIO-ED2.

WPD Best View 2023						
Technology	**Units**	**WMID**	**EMID**	**SWALES**	**SWEST**	**WPD**
Solar Generation	GW (installed capacity)	0.971	1.922	0.772	1.676	5.342
Onshore Wind Generation		0.050	0.409	0.548	0.354	1.362
Other distribution connected generation		1.445	2.208	0.893	0.954	5.500
Battery storage	GW (installed capacity)	0.251	0.357	0.027	0.155	0.789
Electric vehicles	Number of vehicles	255,510	184,320	34,863	73,734	548,427
Heat pumps	Number of heat pumps	72,205	95,738	30,839	66,068	264,850

Figure 5.4 WPD Best View at 2023

WPD Best View 2028						
Technology	**Units**	**WMID**	**EMID**	**SWALES**	**SWEST**	**WPD**
Solar Generation	GW (installed capacity)	1.290	2.784	1.090	2.036	7.200
Onshore Wind Generation		0.050	0.414	0.587	0.407	1.458
Other distribution connected generation		1.505	2.353	0.944	1.074	5.876
Battery storage	GW (installed capacity)	0.347	0.430	0.065	0.223	1.065
Electric vehicles	Number of vehicles	859,665	739,693	168,661	318,053	2,078,872
Heat pumps	Number of heat pumps	248,492	352,980	109,712	181,870	893,054

Figure 5.5 WPD Best View at 2028

5.71. For RIIO-ED2, the data shows that there will be a significant growth in EVs, increasing from 550,000 to 2.1 million while the number of heat pumps is set to grow from 265,000 to 893,000.

Planning and network system development – RIIO-ED2 projects

Planning and Network System Development – Our RIIO-ED2 Projects		
Project Title	**Background**	**Project Details**
Network Analysis for DSO	Traditionally DNOs have analysed and planned the network against set of relatively certain external parameters such as future load growth. However, the range of scenarios for future growth of electric vehicles, heat pumps and distributed energy resources means that there is a requirement to carry out multiple sets of network analysis against the range of future energy scenarios. In addition there are more network solutions available; WPD has a suite of smarter or flexibility based solutions which could be used instead, or in conjunction with, conventional network infrastructure upgrades.	This project implements a set of new applications that support the increasingly complex analysis of network requirements and available solutions. The applications will bring together time series data for measured points on the network, DER and DSR metering data and Active Network Management schemes data and provide the capability to assess all the requirements together to understand where there are network constraints that require additional capacity.
Data Historian	Currently data used for network planning purposes is held within a data-logger, which stores half-hourly load readings for HV feeders and some half hourly metering data. The growth in availability of different types of data requires more storage capability, along with an enhanced capability to interrogate the different sources of information.	The data historian will be an implementation of a specific database and tools for time series network data obtained from the network management system and other data such as smart metering data obtained via the Data Communications Company Adaptor. The historian will be integrated with various network analysis applications to improve the robustness of longer term network planning.
Stability Analysis	Distribution network operators have traditionally not needed to model for stability conditions on the system, but as the energy system changes, a lower inertia power system may place additional constraints on distribution network operation. When generation meets demands and all necessary conditions such as voltage and frequency are maintained, the system is stable and balanced. However, any mismatch or excursions outside required parameters can cause generators or circuits to trip, which can then cause other issues and further trips.	The project will develop the tools to understand and model sub-second voltage collapse conditions and how these may drive requirements on the way distribution network operation can support the voltage stability of the system.
Planning State Estimation	State estimation is used to provide a view of the network configuration and operational status, informed by a set of measurements and data. Within a planning context it is used to determine representative characteristics of the network to allow network planning and development decisions to be made. Increased network monitoring and new	This project will seek to merge the data streams from more accurate real-time monitoring, current and historical network configuration topologies and alternative sources of network data to improve state estimation being used in network planning. Inconsistencies, errors and inaccuracies can be identified through the state estimation

	sources of data mean that there is greater scope to improve state estimation for planning purposes and also the various data sources can be used to cross-check each other and identify data anomalies.	modelling and these issues can be fed back for resolution in the core systems to improve data quality and reliability.
DFES Data Architecture and Systems	Distribution Future Energy Scenario (DFES) work completed within WPD uses data from local authority and other key local stakeholders, supplements it with market information on technology roll out and national energy system predictions, informing WPD investment plans and requirements for additional network capacity. The output of this will have an important part to play in identifying network needs, driving flexibility markets and having more of the data shared for third party use.	This project will also develop a data architecture to ensure the DFES process is more efficient, consistent and repeatable providing information that is accurate and accessible. DFES data architectures and systems will need to be designed around third party access to the datasets and there may be a requirement for performance aggregation, anonymisation or other reporting functions on this data before making it available publically.
Planning Data from Smart Meters	As more smart meters are installed there is scope to use the information to improve assumptions about load profiles and usage patterns. The smart meter data will help to refine the usage profile templates that are currently used for network planning considerations. While the data will be provided at LV it can also be used to inform assumptions about HV and EHV behaviour. In particular it can be used to confirm/refine HV level data at substations by aggregating the LV information. For example it can be used to show the impact of embedded distributed generation on network demands along a HV feeder.	Various different analysis approaches will be adopted including data aggregation, statistical analysis, machine learning and Artificial Intelligence (AI) technology to inform better assumptions about demand profiles. These actions will be carried out In accordance with WPD's Smart Meter Data Privacy plan.
Customer Facing Network Assessment Tool	During ED1 WPD developed a new low voltage network assessment tool (NAT) used for designing network changes. It was developed as part of our Electric Nation project and has been subsequently implemented as a business as usual product for our planners to use. The legacy systems required a level of technical knowledge and the ability to interpret data from multiple WPD systems to develop a design. The NAT tool is far more interactive than previous systems and the majority of interpretations are now automated within the new tool.	Towards the middle of RIIO-ED2 we plan to offer this design functionality out to our customers. This will require establishing a platform from which the tool can operate externally, along with the appropriate access and security controls. By using the NAT design model we will be able to offer customers a simple go/no-go decision for the connection of new demands and LCTs on our network. This will help customers with feasibility work at an early stage of projects and will progress enquires through to quotation more quickly when connection plans are firmed up.

Figure 5.6 Our RIIO-ED2 Planning and Network System Development projects

Timing of network investment and use of flexibility

5.72. During RIIO-ED1, we have established flexibility markets that provide an alternative means of addressing network constraints. These make use of new technology and the ability of some network users to provide flexibility in their own consumption either by increasing, reducing or shifting their net import or export.

5.73. This flexibility can be commercially utilised by us to:

- Offset the need for conventional reinforcement
- Provide more capacity for other connections
- Improve our network resilience
- Increase system operability.

Using flexibility to provide additional capacity

5.74. When considering how to address a network constraint, we will always consider whether flexibility offers a more economical solution. By adopting a 'flexibility first' approach, we can operate a more efficient and economical network.

5.75. Ideally, network capacity will be increased when the network is approaching its capacity limit, with work starting just ahead of need and being completed as the new capacity is required.

5.76. Because conventional reinforcement can take a long time, this can cause problems and delays for customers who want to connect to heavily loaded parts of the network. They may have to wait until the network is reinforced until they can connect or may be forced to accept a lower capacity connection.

5.77. Flexibility can provide more granular increases in network capacity, better reflecting the in-year requirements of network users. Flexibility can also help to manage capacity shortfalls economically and responsively until the need for conventional reinforcement is established. In some circumstances, a longer period of flexibility may allow for more appropriate, long term investment plans to be implemented. Flexibility can also be used to connect new customers to heavily loaded parts of the network without the need for reinforcement.

5.78. While we will be making greater use of flexibility, there will still be situations where it is necessary to carry out conventional network reinforcement, for instance, where there is insufficient flexibility provision to tackle the level of network constraint.

5.79. The following diagram illustrates the different approaches that may arise.

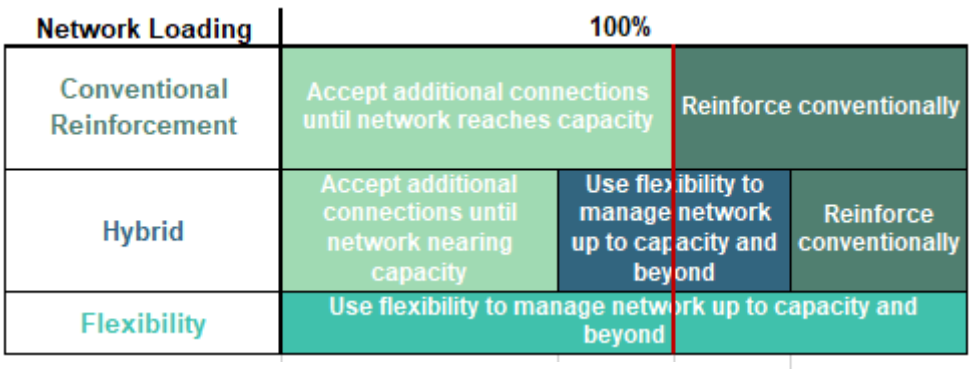


Figure 5.7 Approaches to using flexibility to improve network utilisation

5.80. Work to identify the need for flexibility provision will begin at an earlier stage than plans for conventional reinforcement. This will give us time to assess if there is sufficient flexibility available and where it is not available to carry out conventional reinforcement.

5.81. By creating an investment trigger for flexibility, which is ahead of the trigger for conventional reinforcement, we can ensure the flexibility market is fully explored before conventional reinforcement needs to start. Generally, this will involve publishing flexibility requirements and investing in flexibility 12 months ahead of the time that a conventional investment decision would be made.

Using flexibility for new connections

5.82. Flexibility is not only used to provide additional capacity to manage load-related constraints. We've also developed and trialled processes enabling us to use flexibility to provide additional capacity for new connections coming onto the network.

5.83. In Constraint Management Zones (CMZs), any flexibility that is not needed to meet existing network constraints can be used to offer capacity for new connections.

5.84. Connecting customers in need of network reinforcement will be offered a flexibility solution as an alternative to conventional reinforcement. They will be offered two payment methods: one option will be to pay the costs for flexibility and assets retrospectively on an annual basis, while the other will be to settle the costs upfront, based on WPD's Best View of the blend of flexibility and asset costs that will be required. We will manage the constraints using flexibility and take on the risk and responsibility for doing so.

Distribution Network Options Analysis (DNOA)

5.85. WPD's DNOA process provides a systematic methodology to recommend a single investment option.

5.86. If reinforcement is deferred by flexibility, this means ongoing payments must be made to flexibility providers to turn down or turn up import or export of power to allow other customers in the CMZ to get the power they need. Initial flexibility costs may be small but, as network requirements grow, more flexibility will need to be procured, resulting in rising flexibility costs. If network requirements are reduced by changes in demand or generation, flexibility costs may also fall.

5.87. We compare the viability of the various options by using the Common Evaluation Methodology process, which has been developed under the Energy Networks Association Open Networks programme. This process considers multiple factors including financial, social, losses, safety and carbon benefits to determine the right investment pathway.

Operating our network in RIIO-ED2

Changes to network operations

5.88. Traditionally, the work of a distribution network operator has been relatively passive, with power flowing in one direction from the transmission system to consumers. Network operation has focused primarily on responding to replacing assets, connecting new customers, network faults and alarms, outage planning and coordinating access to the network for work activities. These functions will all continue.to be a part of what we do.

5.89. However, the growth in intermittent distributed generation and decarbonisation of transport and heat has led to reverse power flows, increased loads and greater need to redirect power flows away from heavily loaded parts of the network. This has resulted in the implementation of Active Network Management (ANM) to enable connections to be made in areas where our network is heavily loaded and the evolution of flexibility markets, where capacity is provided by flexibility providers adjusting their demand or generation output.

5.90. There are also other factors driving us to optimise the operation of the network, including managing voltages, losses and power factor (which is a measure of energy efficiency). These all call for increasingly sophisticated and smart approaches to network operation.

5.91. The changing role of the network operator requires new data and processes to help us analyse what is happening on the network. We also need more active ways of managing constraints, such as systems for dispatching flexibility, as well as greater coordination with the Electricity System Operator. We are already dealing with an increasing quantity of data and will need to enhance existing systems or develop new ones to enable the efficient and operation of the network to continue.

Flexible connection solutions

5.92. Traditional approaches to connections require customers to fund a proportion of the network reinforcement costs where additional network capacity is required. At higher voltages this work may also take a number of years to deliver. For new connections this creates costs and delays.

5.93. Our suite of flexible connections gives customers the option to have their connection completed at a lower cost and to a shorter timescale, with the acceptance that some form of curtailment may be required at times of high demand on the network.

5.94. Our flexible connections suite has developed options in two areas for customers seeking to connect to the network. A Timed Connection offers a very simple way of acting flexibly, without the need for communication or monitoring. Load Managed Connections make use of Active Network Management (ANM) technology to control generation or demand by using single or multiple constraints. These are particularly useful in areas of heavy network loading as an alternative to reinforcing the network.

Flexible Power solutions

5.95. Flexible Power solutions are contractual arrangements where customers with controllable demand or generation are able to provide services to help us manage the capacity of the network. They are used as a lower cost alternative to reinforcing the network and are procured through a flexibility market.

5.96. We have been pioneering the use of flexibility solutions during RIIO-ED1 and will be using these increasingly throughout RIIO-ED2 as more demand connects to the network.

5.97. There are four types of flexibility services:

- Secure – used to proactively manage peak demand

- Dynamic – used to support the network in case of a coincident fault during network maintenance
- Restore – used to reduce the stress on the network during fault situations, with flexibility providers responding within 15 minutes
- Sustain – used to allow customer to change their energy profile to reduce costs

5.98. The existing IT platforms used to assess the requirements for flexibility, manage the dispatch and make payments for the flexibility provided will require development to ensure that flexibility can be used to a greater extent.

5.99. In RIIO-ED2 we will continue to develop the IT systems, processes and customer information visualisations, targeting investments in areas identified by stakeholders. This will include opening live information access to other platforms, improving the cyber resilience of the IT systems and scaling-up as operational volumes increase.

Network operations – RIIO-ED2 projects

Network Operations – Our RIIO-ED2 Projects		
Project Title	**Background**	**Project Details**
Cyber Security and Networking	It is expected that cyber security risks will continue to grow during the ED2 period. Network and Information Systems (NIS) Regulations will continue to evolve leading to improvement actions on access control, intrusion detection and attack recovery. While many of these actions will be implemented on the control systems hardware or within the data communications network, there will also be a need to implement application level changes	We have identified a need for further physical segregation and improved network security architecture on controls systems hardware and the operational telecoms network. Enhancements will be needed for PowerON applications, the growing number of distributed control systems supporting DSO solutions (such as Active Network Management, Demand Side Response and System Voltage Optimisation) and network analysis systems using machine learning and artificial intelligence.
PowerOn Core IT Server Hardware	The hardware used by the PowerOn system typically has a 5-10 year life and we refresh half of the hardware estate every 5 years expecting it to operate as the main system for 10 years.	New servers will be bought which will become our production (live) system. The older ones will be reused as our pre-production (test and development environments). The previous pre-production kit will be disposed of (after 20 years of use).
Distributed Energy Resource Management – Hardware/Hosting	We are expecting increased requirements for existing applications as communication expands to more devices on the network. We also expect an expansion of the range of different applications that will require to interface to the network management system to support further real time analytics, optimisation and control.	We propose to use more powerful hardware to consolidate a range of existing separate servers onto a single platform. The new hardware will use a process of virtualisation to allocate memory and processing capability from the main server to individual applications.
PowerOn Application Enhancements	There are a range of PowerON enhancement projects that will be implemented during the ED2 price control. Some of these enhancements are already known, whereas others will emerge as additional functionality requirements are identified.	WPD will be implementing enhancements that will make greater use of state estimation and pseudo analogues, allow the expansion of system voltage optimisation and expand self-learning optimised fault restoration automation

Distributed Energy Resource Management – Applications	A range of projects have been identified to support new DSO functions.	A Demand Side Response customer facing system will be used for WPD's Flexible Power arrangements including contracting, monitoring, despatch and settlement. LV network visualisation will enable data about the LV network to be displayed to control engineers. This will include the information being directly monitored at distribution substations as well as pseudo analogues derived from other sources.

Figure 5.8 Our RIIO-ED2 Network Operations projects

Opening up the flexibility market for RIIO-ED2

Providing market information for flexibility services

5.100. There are many electricity consumers who have the potential to shift their demand, by changing the times they use power, or adjusting their export from on-site generation.

5.101. The flexibility market allows these customers to earn a financial payment for the provision of specified flexibility services.

5.102. The type and amount of service required is dependent upon the nature and scale of a constraint on the network, which could be as a result of increased loads at certain points in time.

Forecasting

5.103. Forecasting is a single-scenario view of the constraints on the network across a two-year window. It explicitly states WPD's flexibility requirements and is used to advise what flexibility is being sought during procurement cycles. It describes the amount of flexibility required and specifies the availability window (i.e. when the flexibility is required).

5.104. Forecasting data enables flexibility providers to respond to flexibility tenders and because it is openly available, it allows different providers the same opportunity to participate in the market.

5.105. WPD's Flexible Power website provides a map of constraint management zones (CMZ), a postcode finder to allow potential suppliers to confirm their site is within the CMZ and the operational window for which the demand response will be required.

5.106. The availability window details the time of day, the day of the week and month of the year, MW change required and a forecast of the total MWhs. Operational windows are generally seasonal to support the constraints during the summer and winter demand peaks.

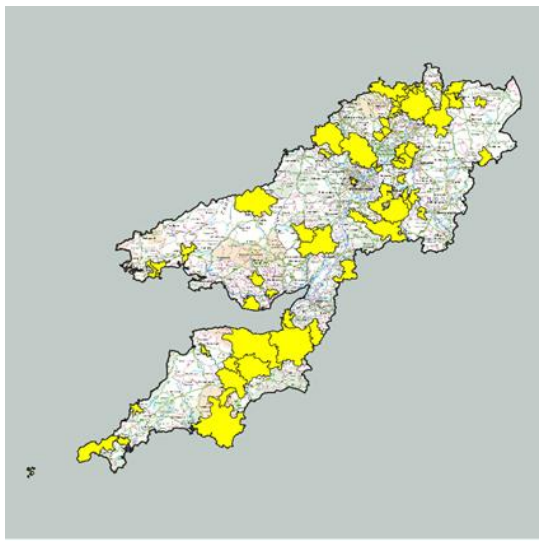


Figure 5.9 Distribution Future Energy Scenarios map

Accessibility to markets

5.107. We expect flexibility services will be provided by many different market participants including demand-response aggregators, electricity suppliers, generation operators, battery operators, industrial and commercial customers, local authorities, community groups and electric vehicle charging operators.

5.108. We know that each of these participants may wish to provide services through a variety of routes so we have established access through a number of channels.

Flexible Power By Western Power Distribution	The Flexible Power brand has been created by us to deliver the procurement of demand response services. It acts as our customer facing brand when seeking flexibility services and is implemented consistently across all four of our licence areas. As well as providing visibility and enabling routes to participation, Flexible Power also encompasses our flexibility participant portal and electronic dispatch, monitoring and settlement services.
piclo®	Piclo has developed and trialled the UK's first GB-wide flexibility marketplace, supported by funding from BEIS Energy Entrepreneurs Fund. We have displayed our flexibility requirements on the Piclo platform since November 2018. Flexibility providers with matching assets in WPD Constraint Management Zones are directed to WPD's Flexible Power site to enter procurement.
	At a more local level, we have been a partner on Centrica's Cornwall Local Energy Market (LEM) project since July 2017. This project is developing a virtual marketplace for flexibility services across the Cornwall region. The Cornwall LEM project is targeting both business and residential customers and is providing new technology solutions to enable flexibility and help unlock new revenue streams for customers.

5.109. To stimulate market participation, we are enhancing the suite of tools under Flexible Power to provide better market integration. These actions are set to be completed during RIIO-ED1 and include:

- Availability of geographical and postcode information for platforms to pre-qualify and validate flexibility assets (Q1 2021)
- Standardisation of visibility and forecasting data for hosting on flexibility platforms (implemented)
- Improved sources of data for asset qualification – e.g. linking MPAN to constraint managed zones (Q1 2021)

5.110. In RIIO-ED2, we will develop improved, automatic integration with platforms using standardised data exchanges. We will deepen the data provided to the market on our system needs and serve that data more widely.

Procurement process for flexibility services in RIIO-ED2

Procurement cycles

5.111. Since 2019 we have been operating a multiple cycle approach to procuring flexibility. Our approach allows us to test the market every six months, giving more participants the opportunity to provide this service. This means that WPD contracts with flexibility services in three tranches between six and 18 months ahead of need.

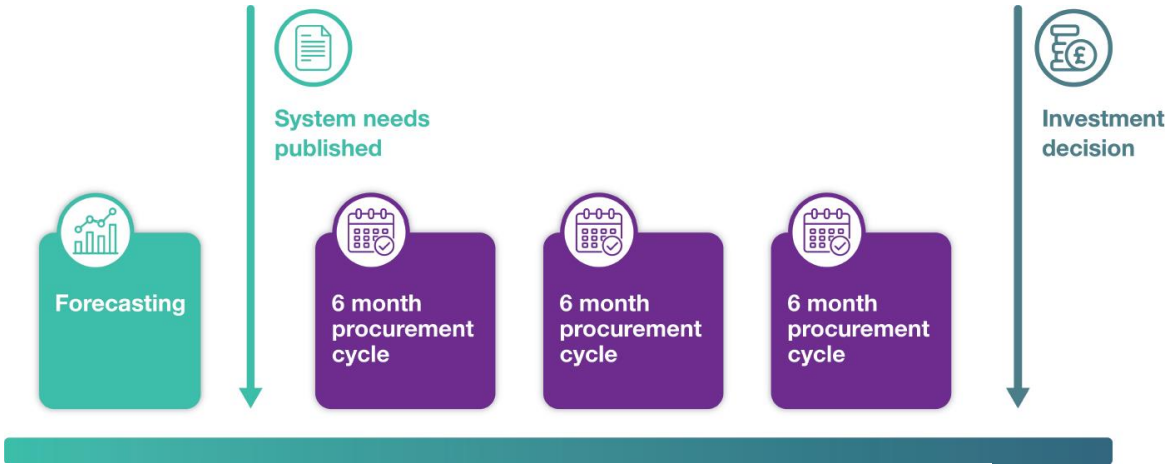


Figure 5.10 Timetable for providing visibility of flexibility services requirements

Procurement qualification

5.112. Potential suppliers of flexibility need to undergo a registration process but, once registered, the suppliers are invited to consider providing services at each procurement cycle, without further requirement to register.

Technical requirements for participation

5.113. To provide flexibility services, potential suppliers must meet some technical requirements. These include the ability to provide minute by minute metering, integration of systems through an Application Protocol Interface (API) and the ability to dispatch when instructed. The API is software-based and can be set up in-house by the majority of participants without the need for any proprietary or specialist hardware.

5.114. WPD seeks flexibility from a wide range of providers and has not set a contractual minimum limit for participation. By removing the potential barrier of a commercial minimum, we're making direct participation possible for a larger range of participants, including those connected at lower voltages. Because of the technical requirements in place, the co-ordination of portfolios belonging to smaller market participants is expected to be done through aggregators.

5.115. While some larger market participants will contract directly with WPD, aggregators can offer an important alternative route to market. Aggregators act as co-ordinators of services and enable participants to stack revenues for providing different types of service. They can use their expertise to allow more flexibility providers to participate in the market.

Pricing structures

5.116. Since 2019, WPD has been operating a pricing structure that is dependent on the level of competition revealed through the procurement process. Each Constraint Management Zone (CMZ) is assessed independently because of variations in the number of flexibility providers and scale of flexibility provision. We have established a three phase strategy, with each phase reflecting the maturity of the market. The prices paid are based on the availability of flexibility in each CMZ. This starts with fixed pricing for non-competitive markets, pay-as-clear arrangements for markets with some competition and excess of suppliers, and shorter term contract pricing for fully mature and liquid markets.

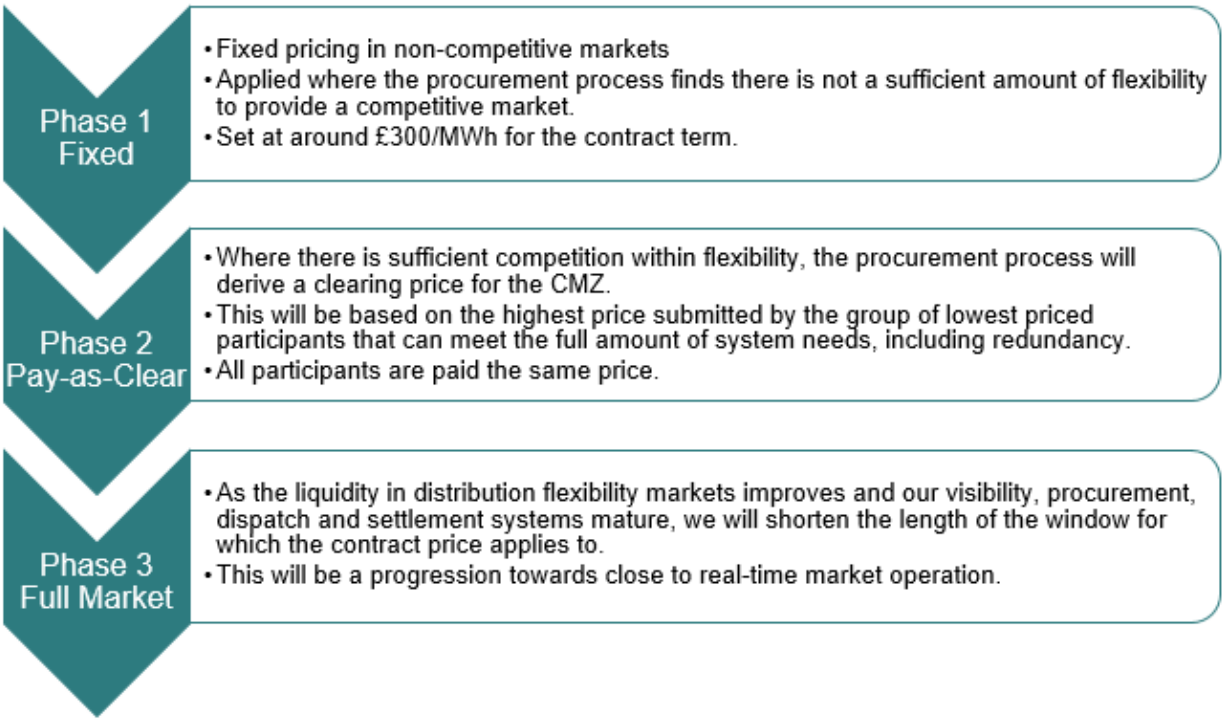


Figure 5.11 WPD's Pricing Structure

5.117. Because the markets are at an early stage of development during RIIO-ED1, we expect most CMZs to be based on a fixed price basis in the short term. However, as flexibility provision and competition grows in a CMZ, we will move towards the phase 2 and 3 stages during RIIO-ED2.

Specified flexibility services

5.118. WPD has developed four Demand Side Response services that each address different requirements on the distribution network. The services are called Secure, Dynamic and Restore. These have been adopted as industry standard services under Open Networks, as well as our additional Sustain service. We will continue to utilise these services for RIIO-ED2.

Secure

5.119. The Secure service is used to manage peak demand loading on the network and pre-emptively reduce network loading. As these requirements are predictable, payments consist of an Arming fee which is credited when the service is scheduled (irrespective of whether it is used) and a further Utilisation payment awarded on delivery (related to the amount of flexibility provided).

5.120. Secure service requirements are declared in advance for the following week. The week-ahead declarations are scheduled to allow providers to participate in alternative services when not required for the Secure service.

Dynamic

5.121. The Dynamic service has been developed to support the network in the event of specific fault conditions, often coinciding with other outages for maintenance work.

5.122. As the service is required following a network fault, it consists of an Availability fee and Utilisation fee. By accepting an Availability fee, participants are expected to be ready to respond to Utilisation calls within 15 minutes. Utilisation under the Dynamic service is usually expected to be of a longer duration compared to the pre-emptive Secure service.

5.123. Dynamic availability windows are also declared in advance for the following week.

Restore

5.124. The Restore service is intended to help with restoration following rare network fault conditions. Under such circumstances, the Restore service can be used to reduce the stress on the network.

5.125. As the requirement is inherently unpredictable, Restore is based on a premium 'Utilisation only' fee. This will reward response that aids network restoration, but will pay no Arming or Availability fees. Participants who are declared available for the Restore service will be expected to respond to any Utilisation calls within 15 minutes and will receive an associated Utilisation fee.

Sustain

5.126. The Sustain service is currently being trialled in the WPD region, specifically targeting domestic users who are able to adjust their consumption behaviour to set windows across the year. Successful delivery of this adjusted energy profile is financially rewarded.

5.127. Sustain services are forecasted many months ahead of operation and provide a simple, contractual method of self-dispatch to allow domestic participation.

Contractual terms

5.128. WPD has worked collaboratively with the industry to develop a common set of terms and conditions and was the first DNO to adopt these. Informed by stakeholder feedback, they provide low barriers of entry, maximise participation and reduce complexity. They include:

- Mutual and capped liabilities
- Performance based payment mechanisms to incentivise participation
- No penalties for non-delivery, only loss of potential revenue
- No exclusivity clauses
- No obligation to provide availability

5.129. Our contracts do not have any exclusivity, maximising the ability for a flexibility provider to increase revenue opportunities by providing services to other parties.

5.130. The products we are offering are designed to be stackable with other revenue streams and are particularly complementary with the ESO's reserve products.

5.131. The products being offered are also aligned with other distribution system operators' flexibility services and use the common terminology developed under ENA's Open Networks project.

5.132. Following feedback from flexibility providers, we have altered our contractual length to give better certainty for market participants. Since 2019, we have been allowing flexibility providers to choose their optimum contract length, from between one and four years and this arrangement will continue into RIIO-ED2

Operating process

5.133. When flexibility providers have accepted contracts and established the API interface, they are available for providing flexibility services. They are paid when they participate and declare availability, as well as when they respond with sufficient change in their demand or generation as required.

Dispatching flexibility

5.134. We recognise the importance of being transparent about the way flexibility is dispatched to help market participants understand how to maximise returns.

5.135. Where competitive markets have developed, this may result in multiple flexibility providers being able to provide flexibility (as per Phase 2 or Phase 3 pricing). Where this is the case, we select the priority order on which flexibility assets are accepted and dispatched first.

5.136. By being transparent about the rules we use to dispatch flexibility, we allow flexibility providers to consider what service to provide and how to make these available.

5.137. As the market grows and matures towards full market-led pricing during RIIO-ED2, then pricing submitted for each flexibility asset will become the dominant factor for consideration.

Reporting of flexibility procurement/ utilisation data

5.138. We publish raw data on signposting and forecasting through our Network Flexibility Map. This includes the availability windows and expected market volumes required for all the DFES scenarios for a five year period under the Signposting process. Visualisations of the data are available online through the mapping tool. The geographic dataset is also downloadable without registration.

5.139. Our procurement market data will be refreshed every six months, replacing the raw data on the mapping visualisation. Summary PDFs are also available for download.

5.140. For every six monthly cycle of procurement, we publish market information detailing the requirements for procurement at each of the Constraint Managed Zones. This includes information such as the MW required, expected MWh availability windows and MWh estimated utilisation volumes.

5.141. A value calculation tool is available on the Flexible Power website to help participants understand potential revenue values.

5.142. Since 2018, WPD has published a procurement cycle results document within one month of contract award, summarising the various stages and results of the tendering process. As the tendering process has developed, more information has been published. including:

- Volumes of flexibility coming through the ‘invitation to tender’ stage
- MW capacity and technology of assets being awarded contracts per CMZ
- Pricing data bid in to the procurement process
- Prices of flexibility awarded in each CMZ

Secondary trading of flexibility contracts

5.143. In RIIO-ED2, we will continue to procure flexibility by using bi-lateral contracts between WPD and third party flexibility providers.

5.144. All WPD flexibility contracts will be aligned to the latest version (at the time of contract award) of the GB-wide standard contract (developed under Open Networks) ensuring consistency of

terms. The Open Networks common contract does not prohibit the transfer of contracts, but does require permission from WPD to permit the transfer.

5.145. The standardised DSO products and flexibility contract terms now in place act as enablers for flexibility contracts to be traded between providers on a peer-to-peer basis. By standardising the pre-qualification processes and using more datasets, we will be able to facilitate the trading of flexibility contracts through multiple routes. We will work within the Open Networks framework to ensure any learning is shared across the industry.

5.146. During RIIO-ED2 we will work with flexibility providers, market operators and platforms to develop practices and systems that allow the secondary trading of flexibility contracts. This will include standard contractual agreements between parties, analysis methods for assessing tradability, monitoring systems for compliance and data systems for providing commercial visibility.

Governance Arrangements

Our Commitment to a competitive connections market

5.147. We have a strong track record of working with alternative connection providers. This is illustrated by the way in which we provide information and support to Independent Connection Providers (ICPs) and Independent Distribution Network Operators (IDNOs) to increase competition in connections.

5.148. We've made network data available to ICPs/IDNOs, enabling them to increase their capability by completing their own design work. This WPD-owned data is shared to encourage greater competition in connections. All network planners have equal access to our data, whatever company they work for, as part of our commitment to a neutral connections market.

5.149. Our cooperation with ICPs/IDNOs in developing a competitive connections market demonstrates that we can act as a neutral facilitator and support the development of alternative ways of delivering work.

Development of flexibility services

5.150. The development of our flexibility services includes a commitment to extensive stakeholder engagement, publication of information and standardisation across the industry.

5.151. Flexible Power, our flexibility product, was developed through the ENTIRE innovation project, which involved stakeholders throughout the process. We have since sought to make Flexible Power a standard for flexibility across all DNOs. We continue to engage with stakeholders, using their feedback to inform our evolving flexibility contracts and operational arrangements.

5.152. We are committed to being transparent about the work we do. The data we publish about Constraint Management Zones allows us to be transparent about the needs of the network. We are also transparent about pricing structures, contractual arrangements and the way we plan to dispatch flexibility.

5.153. As flexibility markets develop in RIIO-ED2, they will continue to influence our approach to capacity constraints, network access, network design and commercial arrangements. As they evolve, we will continue to develop processes to ensure we remain a neutral facilitator of these markets.

Independence of decision making

5.154. To deliver the network outcomes we need in the most economical way, WPD uses the DNOA process. This recommends an investment option based on the profiled capital and operational expenditures of a range of technically viable possibilities.

5.155. Our DNO activities use network design expertise to determine how assets are installed, maintained and repaired. This includes identifying the applicable capacity ratings which can be delivered by these assets.

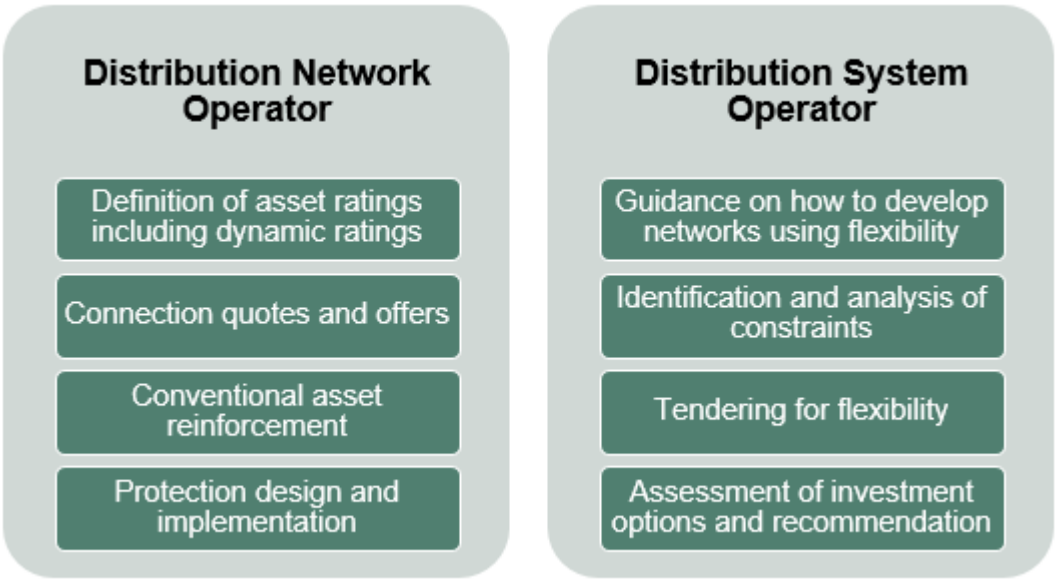


Figure 5.12 DNO and DSO Functional Responsibilities

5.156. Our DSO function is responsible for understanding how the system operates and identifying potential capacity shortfalls or network limitations that require additional investment. As a DSO, we develop the flexibility products needed to meet these system constraints and ensure enough information is published to enable distribution flexibility markets to be established.

5.157. The DSO function assesses the identified investment options and makes recommendations based on published criteria. These recommendations will also be published to ensure transparency and enable scrutiny.

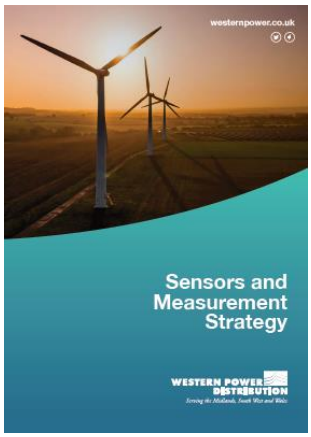
5.158. If the investment recommendation is to use flexibility, the DSO will procure flexibility services through the market to meet these system needs. If the investment recommendation is conventional reinforcement, the DSO function will instruct the DNO function to begin a conventional network build.

5.159. The decisions made leading to the recommendations will be subject to audit to ensure compliance with the agreed processes.

Enhanced network monitoring

5.160. We understand the importance of operating a smart electricity network. This will enable us to release the capacity available in the network, allowing our customers to realise their net zero ambitions and helping us to operate the network in a cost effective and efficient way. To do this, we need sensors and measurement devices on our system to capture critical data and operate our network automatically.

Our Sensors and Measurement Strategy



5.161. In April 2020, we published a Sensors and Measurement Strategy, which identifies the monitoring requirements needed to develop smart networks, improve network design and enhance network security.

5.162. It is available on our website at https://www.westernpower.co.uk/downloads/110980

5.163. The successful operation of these new systems is dependent on good quality, reliable, and timely data on the state of the network. To capture this, we need to carry out significant work to upgrade WPD's data acquisition capabilities.

5.164. To provide flexible connections, we must be able to control the associated load. When the network is highly loaded and unable to accept the generator's full output, this may involve curtailing export or using flexibility services to manage constraints. This means engaging with other connected customers who are able to operate flexibly and who can be contracted to alter their generation and/or consumption on instruction.

5.165. Whether we mitigate constraints using alternative connections, flexibility services, or a combination of both, the need for accurate, reliable real-time data allowing real-time analysis of the network remains crucial.

Improving network design

5.166. The growth of distributed generation and low carbon technologies also has an impact on the information we need for network design purposes. Historically, we needed little more than the maximum demand at a substation to ensure the adequacy of the network. Improvements are therefore needed in the way in which measurements are taken and recorded for planning and design activities.

5.167. That's why we are upgrading our measurement capability by adding more sensors at all voltage levels within the network. On our 11kV and higher networks we will spend around £35m by the end of RIIO-ED2 to ensure that directional power flow is available at all primary substations, augmenting the maximum demand unidirectional data that currently exists.

Power quality impacting network security

5.168. By monitoring power quality on a continuous basis, we can develop a better understanding of the levels of harmonic distortion on the network. We can then act on this knowledge to prevent damage to network assets and to reduce the risk of protection mal-operation resulting in significant load loss events.

5.169. During RIIO-ED2 we will upgrade the power quality measurement at around 240 sites across the whole of WPD.

Enhanced network modelling – RIIO-ED2 projects

Enhanced Network Modelling – Our RIIO-ED2 Projects		
Project Title	**Background**	**Project Details**
Distributed Energy Resource SCADA Monitors	As more DER has connected to the network and the management of the network becomes more active there is a need for improved visibility of the operating regime of DER.	This project will continue a programme of retro-fitting telemetry to customer points of connection where significant distributed generation or other flexible DER are located.
Directional Power Flow at Primary Substations	The growth in generation connected to the distribution network is leading to different power flows, which in some cases can flow in the opposite direction to the way the network was designed.	In order to gain a better understanding of reverse power flow and power factors, power flow monitoring equipment is to be installed at all primary substations giving visibility of the 11kV network and higher voltages.
EHV Monitoring for Smart Systems	WPD has been rolling out various smart solutions during RIIO-ED1, including Active Network Management and Demand Side Flexibility. During RIIO-ED2 other smart grid solutions such as System Voltage Optimisation will be applied more widely.	This project will proactively fit additional sensing and monitoring to sections of the network prioritised for expansion of smart solutions.
Power quality monitoring	With more low carbon technologies relying on inverters for connection to the network, power quality is becoming an increasingly important consideration. Excessive levels of harmonic distortion have detrimental effects on the network such as increased thermal stresses on equipment.	The project will install monitoring for power quality on a continuous basis, the levels of harmonic distortion on the network can be better understood and acted upon in order to prevent damage to network assets or to prevent protection mal-operation resulting in significant load loss events
LV Network Monitoring	Domestic customers are increasingly adopting low carbon technologies such as rooftop solar panels, electric vehicles, and heat pumps. Electric vehicles, in particular, have the potential to add very large levels of demand co-incident with existing periods of maximum demand. 1.367. This level of demand growth will lead to a requirement for reinforcement of the LV network, but opportunities should be taken to verify the requirement and prioritise the work.	Monitoring at LV will provide greater visibility of the loads, allowing pro-active measures to be taken in real time and providing a more accurate view of reinforcement requirements, deferring the requirement at some sites. It will also provide verification of modelled information, enabling improvements to the modelling assumptions.
Internet Protocol Substation	Original protection and SCADA were electro-mechanical systems and more recently these have been replaced by electronic versions, but often manufacturers have used their own bespoke software and communications standards. Modern systems have become standardised onto Internet Protocol (IP) communications.	This project will test this IP approach to protection and SCADA to establish the working practices and policies for wider deployment.

Figure 5.13 Our RIIO-ED2 Enhanced Network Modelling projects

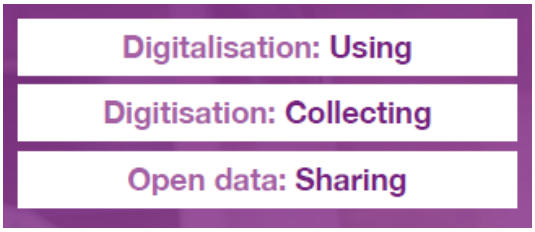
Making our network data available to our customers

Digitalisation Strategy

5.170. We have developed a Digitalisation Strategy and associated Action Plan which are central to our plans fora smarter energy system and increased sharing of data. They are available on our website at https://www.westernpower.co.uk/smarter-networks/digitalisation-and-data

5.171. To understand the scope of digitalisation, we must draw a distinction between digitalisation (using data), digitisation (collecting data) and open data (sharing data).

5.172. For us, the term digitalisation means using digital technologies to fundamentally change how we develop and operate the network to deliver an economic and efficient service for customers.



5.173. Digitisation is the process of collecting information about our network, using sensors and control equipment. We are collecting some information for the first time and converting previous analogue information into digital formats. This allows it to be computer processed in support of digitalisation.

5.174. For Open Data, our starting point is that all data should be presumed open unless proven otherwise for privacy, security, commercial or confidentiality reasons.

5.175. Our core principles are, and will remain, improving data management, increasing network insight and operation and ensuring data is presumed open. These principles ensure value is driven to all parts of the energy industry and beyond, supporting the net zero transition.

Our digitalisation approach for RIIO-ED2

5.176. Our digitalisation activity is driven by our commitment to create a smarter energy system.

5.177. To deliver digitalisation and key data developments, we will focus on improved data management, increased network insight and operation, and presumed open data. This focus will enable us to work towards delivering the key recommendations of the Energy Data Taskforce report. We will continue to work to these recommendations to ensure systems, solutions and data are developed in a way that maximises their value, benefit and longevity.

5.178. By improving and increasing data management, we can increase insight both internally and externally to meet current and future system needs. Standard processes for creating, managing and handling data through a robust data governance process have been implemented and will continue to be developed. We will also continue to invest in solutions to improve our data quality, ensuring we have a single source of the truth.

Improving data management

5.179. Improving our data management provides benefits for both WPD and for our customers and other stakeholders through increasing data description and standardisation of data. It will increase our ability to deliver value from data and enable digitalised solutions to be developed.

5.180. We have already demonstrated improvements in our data management processes through targeted project activity to understand our data sets, lineage, and business and third-party use. We recognise the need for a consistent approach to data management, delivering standardised and effective processes to share data with other network licensees and wider customers and stakeholders.

5.181. We continue to collaborate with all other network licensees through the Electricity Networks Association to establish common data descriptions, metadata standards and approaches to sharing data to ensure that a standardised and interoperable process is taken forwards. We have demonstrated leadership in this area as the first GB DNO to share its complete asset and connectivity data, above LV, in Common Information Model format.

5.182. To improve our data management, we realise there are still changes to be made as we embrace the challenges of this fast-paced area. As part of this journey, we will track and measure our progress to ensure we continue to focus in the right areas.

Data governance

5.183. Our data governance focusses on identifying appropriate data owners and processes and ensuring responsibility and transparency, to enable data quality to be managed and improved. It establishes rules and systems which help us maintain a consistent approach to data improvement and management, as well as providing a channel for feedback.

Improving data quality

5.184. To maximise the value of digitisation, we must continuously improve our data quality. As digitalisation grows, there is a need for more and better quality data. We have seen evidence of this in our developing flexibility activity, where accurate and reliable data has underpinned improved solutions.

5.185. We have already made significant changes to data collection by developing a range of iPad applications for use by field staff. To make long term improvements to data collection, we are increasingly replacing manual processes with automation supported by machine learning.

5.186. We are continuing to invest in automated processes to improve and monitor data quality. These will set clear agreements for suitability to enable clear monitoring and measurement of performance and improvements.

Providing accurate data from a single source

5.187. We store our data using a number of different legacy systems, with the same data stored multiple times (for example, asset records are held in the asset register and in the control systems). Storing data in multiple systems can lead to inconsistencies which is why our focus for RIIO-ED2 is to have a single source for our data.

5.188. We have already begun work to develop and implement our Integrated Network Model (INM), which connects directly to our three main systems: our enterprise asset management, network management and geospatial information systems. The INM identifies discrepancies in data between these systems and uses an automated process to create a single version of our network, assets and connectivity.

5.189. We will create a central Data Catalogue to provide regular and reliable single point access to trusted data in a timely and effective manner. This will enable decisions to be better informed and made more dynamically. It is also becoming increasingly important to have access to more granular data that we can share.

5.190. Extracting value from data is fundamental to a successful digitalised business. Increased amounts of higher quality data will improve the way we operate the network in real-time, allowing more informed actions to maximise the capability of our assets and enhance how we maintain, plan and reinforce our network.

5.191. Our innovation programme has already developed new solutions to enhance the visibility of our network. These solutions, together with advanced control systems, are being rolled out to improve the effectiveness and efficiency of our network operation.

5.192. The availability of reliable centralised data throughout our business means operations can be more coordinated, efficient and effective. Coordination will become increasingly important as WPD systems and network management become more reliant on third party services.

5.193. As well as providing better information for external parties, internal processes can also be improved as the scope of data grows. We will build on our data catalogue and governance activity to ensure that staff have an awareness of the data available and know that data is accessible internally to drive benefits.

5.194. We will continuously and actively look to make developments and improvements, both to the data and the access processes to ensure they're fit for purpose and to support our business objectives.

Additional data and monitoring

5.195. We will continue to improve network load monitoring to give us a clearer picture of the network's operational state as energy flow is now more important than historic maximum demand measurement. This will augment monitoring on HV networks but also add new monitoring to selected LV substations, targeted at areas where there is a high take up of low carbon technologies, or areas where this is projected, to optimise network operation and assess the need for additional network capacity.

5.196. We will use increased asset data to understand the condition of specific assets. This will help to identify and optimise planned interventions, such as maintenance and replacement, using digitalised solutions.

5.197. Additional data will also improve customer facing activities, such as processes for new connections, information about planned outages and constraints, and information for customers affected by power cuts.

Use of external data and services

5.198. We will not only increase the volume of monitoring and data capture on our network, but will also make use of external data sets and services that can be used or combined with our data.

5.199. We already utilise data sets such as weather forecasts to inform our operational decisions. We will be making greater use of smart meter data to inform our processes.

5.200. We recognise that external organisations can help to unlock value from our data, either by using advanced analytical techniques or integrating it with other data sets. By sharing more data with third parties, we have the opportunity to identify new improvements and will consider using these third party services to benefit our network and customers throughout RIIO-ED2.

Presumed Open Data

5.201. We understand that access to our data is vital to support the ongoing development of the electricity and wider energy system. Because data is used by a range of customers and stakeholders, we also recognise that it may need to be presented in different formats.

5.202. Our Data Triage process will ensure that all relevant data is assessed and given a data classification. This will be either open, public, shared or closed. Where data cannot be considered open, we will ensure a version of the dataset can be made available without losing critical value and insight from the data.

5.203. Our online Data Hub is already home to numerous sets of network data and information. We recognise the varying needs of different data users which is why we are committed to sharing data in three main formats to make sure it is usable and valuable to the widest possible audience. These are:

- Easy to use and visual data representations, such as interactive heat maps of network capacity data, providing the direct route to answers for non-technical data users
- Downloadable, standardised and interpretable data for data users to interrogate and drive their own insight and value, different to that presented in visualised representations
- Data automatically presented to technical data users through application programming interfaces (API), focused on regular and repeatable data for instance, to inform real-time dispatch detail for aggregators and flexibility providers.

5.204. Our process of presuming data as open will ensure it is available to optimise existing processes and support new ones, particularly focused on new connections and flexibility provision.

5.205. We are committed to making sure that our data is both discoverable and searchable. This means making it accessible outside WPD and ensuring that we continue to collaborate with the wider industry to ensure data, has the same meaning, format and description, across all organisations.

5.206. We recognise that our data has often been difficult to find and have already taken steps to address this. We will continue to develop our online Data Hub to further improve the availability of, and access to, our data and complementary data sets.

5.207. By presuming our data to be open, we are not simply making it available through our systems and services. Our role is to enable data to be harvested, housed and utilised irrespective of a specific access point. Our implementation of APIs and client Uniform Resource Locators which provides a direct link to an online date resource, will ensure that this is available and appropriate. Our ENA-wide work on the creation of an energy digital system map for the UK has demonstrated our commitment to make our data available for this purpose.

5.208. We will use our improved data management activity to understand our data, its format, its key descriptors and other relevant information to drive value. An online data catalogue, which complements our internal version, will enable customers and stakeholders to find the right data, in the right format at the right time.

Making data available

5.209. We are committed to maximising the value of data from within WPD and utilising external data to inform and improve our decisions to increase and further improve our service to customers.

5.210. We have already started the process of digitalisation through the delivery of several projects in our DSO Strategy and work plan. Many of these projects are helping to provide DSO solutions by creating accessible datasets which will be used both within WPD and shared with third parties.

5.211. The following tables summarises some of the enhancements we have already made:

Energy Data Hub	The Hub is an online facility that provides our customers and interested stakeholders with access to a wide variety of our existing data sets.
Map based data	We have developed a number of open access maps to provide customers, stakeholders and other interested third parties with access to a visual representation of our data, with the option to download the background datasets. We currently have maps for power cuts, network capacity, network flexibility, EV capacity and our DFES.
Integrated Network Model (INM)	The INM enables us to align our previously disparate data sets to enable data improvements and a consistent format of network data
Common Information Model (CIM)	Developing data in to a more consistent format has meant that we can now share our data openly using the internationally recognised CIM standard for the transfer and provision of electricity network data. This allows direct access to a complete asset and connectivity model to support investment and operational planning for customers and stakeholders
Open LV	OpenLV is a common, low-cost monitoring system connected at a substation that enables the use of different apps to provide data to suit the needs of the network, customers and the broader supply chain. We have already seen communities making use of this real-time data to get a better understanding of their electricity use, plan for the integration of increased LCTs and explore potential revenue streams from emerging flexibility solutions.
Smart Meter Data	WPD was the first company to achieve an approved Data Privacy Plan for the use of smart meter data.
Embedded Capacity Register	This Embedded Capacity Register is an industry-wide initiative to capture and share data about all generation assets of 1MW. This data is now publicly available in a consistent format.
System Voltage Optimisation (SVO),	We have trialed System Voltage Optimisation (SVO), utilising data provided by the INM to improve our network management system. This aids automated voltage control, optimising the network for the current power flow conditions meaning that the network can be tailored to maximise the connection of load or generation on the network.
Online GIS	We have provided an online version of our GIS system, available through DataPortal2.0 (https://dataportal2.westernpower.co.uk/Auth/Register) We will continue to develop this to provide customers with the information they need to support their planning activity. It will also act as a basic tool to support a system wide Digital System Map (https://youtu.be/MyZs0wxc0OI).

Figure 5.14 Summary of data enhancements made during RIIO-ED1

Understanding the needs of data users

5.212. Our data and digitalisation activities are informed by extensive and ongoing engagement with data users, both inside and outside WPD. We take part in regular and relevant stakeholder engagement to understand what data is required, the format most suitable and how it can be used most effectively as part of digitalised solutions.

5.213. Our stakeholders have told us they have different needs for, and expectations of, the same data. That is why we are committed to ensuring the right data is available in the right format at the right time to serve different users.

5.214. Different data formats have been made available for users viewing our future energy scenarios. While interactive maps provide users with an easy to navigate geographic view, we also make available more detailed source data to enable more technical users to build their own analysis.

Information technology to support digitalisation

5.215. To support the transition to a fully digitalised organisation, we will rationalise and modernise our IT systems. This will include replacing and upgrading legacy applications; and embracing and investing in new technologies, integration tools and common data platforms.

5.216. Our IT systems have traditionally been developed under the core principles of security, reliability and resilience. While these have served us well in the past, the shift towards open data and digitalisation means we must make our systems more accessible, agile and adaptable to change, as well as continuing to enhance our cyber security controls.

5.217. We will continue to ensure our IT solutions are appropriate, with use cases driving investment in new and augmented solutions. It is anticipated that some of our 'on premise' solutions will become cloud based solutions to ensure they continue to be scalable, supported and flexible. We are likely to adopt a hybrid cloud architecture, utilising infrastructure, platform and software as a service solution (IaaS, PaaS and SaaS).

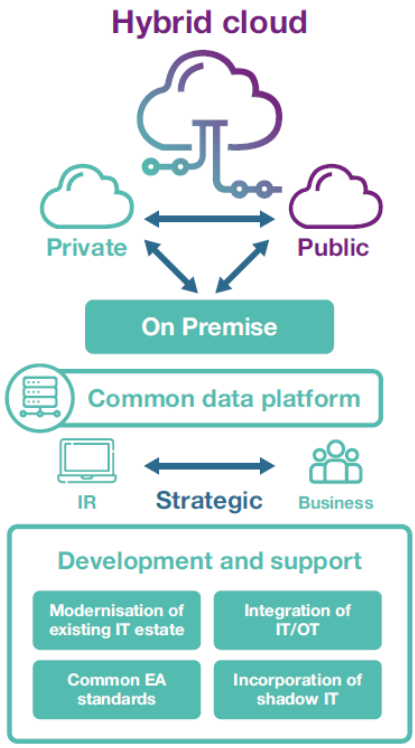


Figure 5.15 Information Technology supporting Digitalisation

Delivering data best practice

5.218. As more data is made available to third parties, we need to make sure we provide it in a clear way. We are committed to ensuring our activities are in line with the Data Best Practice Guidance, adopted by Ofgem, which outlines 12 principles.

Data Best Practice Principles
Identify the roles of stakeholders of the data
Use common terms within data, metadata and supporting information
Describe data accurately using industry standard metadata
Enable potential users to understand the data by providing supporting information
Make datasets discoverable for potential users
Learn and understand the needs of their current and prospective data users
Ensure data quality maintenance and improvement is prioritised by user needs
Ensure that data is interoperable with other data and digital services
Protect data and systems in accordance with security, privacy and resilience best practice
Store, archive and provide access to data in ways that maximise sustaining value
Ensure that data relating to common assets is presumed open
Conduct open data triage for presumed open data

Figure 5.16 Data Best Practice Principles

5.219. We have already undertaken a number of digitalisation and data enhancements aligned to these principles including:

- Adoption of the Dublin Core metadata standard(a common set of 15 metadata elements describing the data for each dataset)
- Providing data in a discoverable and accessible form (such as information maps, guiding users to key network and supporting information)
- Establishing data governance roles
- Implementing a data triage process

Delivering digitalisation – Our RIIO-ED2 projects

5.220. During RIIO-ED1 we have implemented a number of digitalised solutions that have allowed us and our customers and stakeholders to operate more effectively. We have identified a number of developments for RIIO-ED2, aligned to our digitalisation strategy, to further transform our business and continue to deliver value.

5.221. The fast paced nature of digitalisation and data means that we will need to evolve solutions to meet emerging needs throughout RIIO-ED2. We will continue to use stakeholder engagement to shape the changes to meet these evolving needs.

5.222. The currently proposed digitalisation projects for RIIO-ED2 are described below.

Delivering Digitalisation – Our RIIO-ED2 Projects

Project Title	Background	Project Details
Low Voltage Integrated Network Model	During ED1, WPD is developing an Integrated Network Model (INM) for EHV and HV assets. The INM connects directly to our three main systems; the enterprise asset management system (CROWN), network management system (PowerON) and geospatial information system (Electric Office). The model identifies discrepancies in data between these systems and through an automated process creates a single version of our network, the assets and connectivity.	Building on the EHV and HV INM, development the LV INM will be required during ED2 to implement advanced LV modelling approaches and facilitate direct LV data provision routinely to customers and interested third parties. This will also enable the automation of appropriate data for external applications such as self-service LV design tools and dynamic capacity maps.
Internal Data Platform	During RIIO-ED1, WPD is developing a data catalogue to document the types of data held within systems.	This project is an extension to the data catalogue to create a central WPD Data Platform to enable a single location for WPD data and external data used by WPD staff to ensure a single source of the truth and drive value from this data.
Open Cloud Data Platform	Providing customers with access to data will provide the opportunity for new processes, services and network activities to be developed.	This project is for the development and implementation of an Open Data Platform, enabling customers to access raw data or WPD processed data. It will also have the functionality for customers to develop their own specific data sets from disparate data sources using data dictionary information.
Self-Serve Connections and Services Solution	WPD has been facilitating increased competition in connections, working with customers and third party providers to make it easier for others to assess whether connections can be made.	This solution would utilise the data within the Open Platform to facilitate self-serve connections on at least the LV and HV networks.
Automated Data Mastering Solution	Data improvements enable better and more accurate decisions to be made.	This system is proposed to develop automated data improvements. It builds on manual and semi-automated data mastering such as the INM system to continuously and autonomously improve

		the data within internal master data systems.
Artificial Intelligence and Machine Learning Applications	As the operation of the networks becomes more complex, more automated processes will be required. The adoption of AI and machine learning techniques is anticipated to drive value from a Data Platform.	Some examples of applications include automated optimised outage planning solutions and real-time network optimisation and system configuration.
Innovation Hub	The Innovation Hub is an online facility to drive innovation.	The Innovation Hub will allow the sharing of little-understood and unstructured data for further investigation and analysis. It will also be used to share work in an open format so multiple organisations can input and collaborate.
Online work schedule viewer	Third parties want understand when WPD will be carrying out work to coordinate works or understand network improvements to enable them to make informed decisions about their own investments.	This online viewer would provide customers, stakeholders and other utilities information about WPD's planned work.
Automated work scheduling	As more data about the network is collected and machine learning/artificial intelligence methods improve, there is an opportunity for automatic scheduling of work activity based on the results of the automated analysis.	Initially this automation could be rules based, but as more data is analysed the machine learning can be used to refine the decision parameters.

Figure 5.17 Digitalisation projects

Smart metering

5.223. We will take full advantage of the information provided by smart meters, as outlined in our Smart Meter Strategy. This includes using the alerts from smart meters to improve fault response, acting on voltage information to determine network issues and assessing load current to inform the need for network reinforcement, as well as using the data to refine planning assumptions.

5.224. The strategy is available on our website at https://www.westernpower.co.uk/smarter-networks

5.225. Historically, there has been very basic and limited information available about the LV network. The installation of smart meters marks a step change in the visibility of the operational status of the LV network.

5.226. Smart meter data allows us to see aggregated LV network demands in 30 minute blocks, enabling us to make informed decisions about available capacity, the ability to connect new load or generation and the need for reinforcement. The additional functionality and information available from smart metering will enable us to increase our understanding of the network, improve our service to customers and facilitate a smooth low carbon transition.

Smart meter benefits for RIIO-ED2

5.227. Smart meter data has the potential to enhance existing business activities, such as fault management, network planning and asset management.

5.228. For many of these applications, the benefits increase as the number of smart meters increases. This means that the benefits will vary across the network until the rollout is complete.

5.229. To take advantage of the benefits, we have established interfaces with national smart meter data repositories, established data storage systems and have created systems to interrogate and interpret data into existing WPD processes and systems.

5.230. The smart meter roll-out is due to be completed in 2024 with a significant number of our customers expected to have a smart meter installed. We have developed the majority of the systems during RIIO-ED1 in readiness for RIIO-ED2 which will allow us effectively use the data when it becomes available. Many of our network monitoring solutions require a minimum number of smart meters to be present on individual sections network so will grow as smart meters are installed.

Fault response

5.231. Smart meters can issue alerts to notify us of a loss of supply. We already utilise this information to indicate that a single property is without power when the notification comes in.

5.232. Additional functionality allows the 'energisation' status of meters to be checked remotely, giving a clearer understanding of which customers are off supply and allowing us to determine the kind of fault that has occurred (blown fuse, open circuit fault, single premise). This level of visibility – which tells us how individual households and customers are affected - has not been available before.

5.233. Detail like this helps us to dispatch the appropriate restoration resources and improve our restoration times. Where a call relates to a 'single premise', it also helps to identify remotely if the issue is on the network or on the customer's own equipment.

5.234. We have already developed an automated system which handles these messages and checks the meter status before transferring the alert into our fault management systems. Once transferred, we use our established rules to check if an off supply alert is part of a known interruption or whether a new incident needs to be created.

5.235. When the fault is completed, it is possible to check that all supplies have been restored. This is particularly useful in storm scenarios where faults on the high voltage network can mask additional issues on the low voltage network. The ability to check the status reduces the possibility of teams leaving the area while customers are still off supply.

5.236. The rollout of smart meters is set to be completed during RIIO-ED2, which will enable us to deliver an even more efficient fault response for customers. When a smart meter informs us that the power is off, we can ascertain if it's a single meter indicating one property without supply or if there are multiple meters sending the same message, highlighting a wider problem. This will enable us to make a quicker and more appropriate response.

Network monitoring

5.237. Smart meters measure both voltage and current. This data can be used to identify loading issues on the network.

5.238. Voltage data is related to the network rather than the individual and therefore does not need to be anonymised. This allows the measurement of voltage along a feeder, helping to identify potential generation or demand issues on low voltage networks. High voltages at the end of a network can indicate high levels of embedded generation, whereas low voltages can indicate high levels of load. The voltage data can be supplemented with aggregated load data to show whether a particular feeder is highly loaded.

5.239. We can use this data as an early warning of potential issues on our network. It enables us to identify substations with predominantly high or low volts over a long period of time and fit these with substation level monitoring. This monitoring can then verify any issues and allow appropriate reinforcement actions to take place.

Network planning

5.240. Network planning at low voltage uses load profile templates to determine whether reinforcement is required. Smart meter data is being used to verify and refine these load profile assumptions. However, it is not possible to get an accurate picture unless there are enough smart meters on a feeder.

5.241. Our estimates show that 80% of customers on a feeder must have a smart meter, to give a reasonable representation of the whole feeder. To check this estimate is correct, we are comparing smart meter data with data for the whole feeder generated by substation monitoring equipment.

5.242. This will help us to refine the generic assumption used for planning, and open up the opportunity for bespoke analysis for each feeder.

Voltage complaints

5.243. Currently, WPD receives around 500 'voltage complaint' enquiries from customers each year. The existing method of investigating these enquiries is a time consuming and labour intensive process which often finds the voltage was within standard parameters.

5.244. Smart meters can send alerts when over or under voltage thresholds have been exceeded. As more smart meters are installed, this has the potential to generate a number of voltage alerts requiring some form of investigation.

5.245. That is why we are developing a system that will allow us to react to voltage alerts and carry out more desktop-based investigations of reports made by customers.

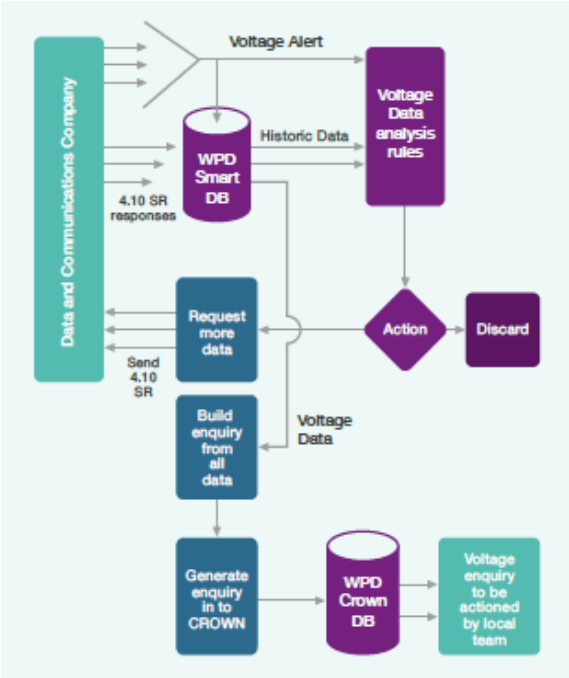


Figure 5.18 Smart Meter voltage alert process

5.246. The system will automatically evaluate voltage alerts from a smart meter. Thresholds will be implemented to filter alerts depending on occurrence rate, timing and level of voltage fluctuations. Alerts which exceed the thresholds will trigger automatic analysis of the other smart meters on the same feeder. When the analysis is complete and preset rules (such as a number of smart meters exhibiting similar alerts) have been met, a 'voltage complaint' enquiry will be raised within the database. This enquiry will be automatically passed to the local team to investigate using monitoring equipment and to correct any issues identified.

Future applications

5.247. We recognise that the electrification of transport and heating, along with the adoption of distributed generation, will present a number of challenges to the operation of the LV network. Smart metering functionality has the potential to support future network operations, either through directing time of use tariffs that benefit the distribution network or using data about the status of the network to support load shifting, controlling vehicle charging or triggering vehicle-to-grid support.

Telecoms infrastructure for the future

Background

5.248. We operate an extensive in-house telecoms network that delivers inter-office data communications, mobile voice communications and supervisory control and data acquisition (SCADA) between electricity assets and control centres.

5.249. We have found this approach to be efficient, cyber secure and highly reliable compared to services offered by third party telecoms providers.

5.250. Our objective is to meet the demands of the future, while maintaining our excellent standards of resilience. The telecoms infrastructure will be reinforced and expanded to enable it to perform more tasks remotely, including patch updates, network switching, protection setting application and network monitoring.

Telecoms RIIO-ED2 challenges

5.251. RIIO-ED2 will provide a number of significant challenges, particularly as a result of the increasing number of electricity assets to be monitored. These challenges include:

- Providing geographical coverage to ensure additional electricity assets can be connected to the telecoms network
- Providing suitable bandwidth to ensure the extra data being collected does not cause congestion on the telecoms network
- Ensuring that the high availability of the telecoms network is maintained as the network grows, enabling it to remain resilient to all types of events especially during a power failure
- Providing cyber security controls on all parts of the telecoms network

Telecoms RIIO-ED2 deliverables

5.252. The deliverables cover the modernisation, enhancement, upgrade and/or replacement of existing systems and technologies, as well as the development and/or purchase of new systems and technologies.

Power flow monitoring

5.253. Due to the increase in distributed generation there is a requirement to install additional monitoring to determine the direction of power flow and power factor. This will be installed at higher voltages giving visibility of 11kV feeders and above.

5.254. This expansion of data collection and communication requirements will require connection to WPD's telecoms infrastructure.

Communication for LV monitoring

5.255. Low voltage monitoring is becoming increasingly important as customers invest in low carbon technologies (LCTs) such as solar panels, electric vehicles and heat pumps, operating within a smart grid environment.

5.256. WPD is proposing to install additional monitoring at locations where there is significant growth of LCTs or where smart meter data suggests that networks are reaching capacity. Estimates suggest that monitoring will be required at around 16,000 substations during RIIO-ED2. The

data collected will allow pro-active measures to be taken in real time and inform the need for network reinforcement.

5.257. To facilitate this data collection, additional communication devices will need to be installed and linked into the telecoms network.

Long Term Evolution (LTe) network

5.258. The existing radio telecoms system used for the control and monitoring of the electricity network is becoming restricted due to its limitations in terms of the number of connected assets and the small amount of throughput data it can handle.

5.259. This limited capability is widely recognised and a modernised LTe radio system is currently under review by OFCOM, with BEIS and OFGEM oversight. All UK gas and electricity network operators collectively agree that an LTe solution is urgently required to support the additional communication requirements for network monitoring and control. An LTe solution will have 100 times more capacity than the current radio system and will be quicker and more cost effective to deploy.

5.260. If regulatory consent is given, we propose to change WPD's radio based telecoms system to an LTe solution to enable improved, resilient and secure communication capability. It will overcome bandwidth constraints and be scalable for future network growth and data demands.

Replacing Remote Terminal Units (RTUs)

5.261. RTUs are microprocessor devices that are installed at substations to collect data from transducers fitted to equipment to enable the data to be communicated back to control systems. As electronic devices, RTUs have a relatively short life.

5.262. During RIIO-ED2 we propose to modernise 2,245 substation RTUs, which have reached the end of life.

5.263. The replacement device will be an internet protocol (IP) enabled RTU providing enhanced two way data traffic that will increase system monitoring capability and allow remote administration of system upgrades. The IP enabled RTU will also be plug and play ready for the next generation of IP enabled switchgear and protection relays.

Replacement of legacy PDH and SDH infrastructure

5.264. Legacy telecoms equipment including Plesiochronous Digital Hierarchy (PDH) and Synchronous Digital Hierarchy (SDH) telecoms apparatus along with other vintage bespoke items will not support the requirements of future electricity network systems.

5.265. WPD proposes to replace these devices with modern equivalents that enable existing remote operations to continue but also manage the enhanced two-way data requirements of the future.

PSTN switch off

5.266. Public Switched Telephone Network (PSTN) has been the UK's established standard for analogue phone lines and is the commonly used method for single line telephony. Integrated Services Digital Network (ISDN) connections allow digital transmission of voice and data communications over multiples channels, making it more applicable for business communications.

5.267. PSTN and ISDN are provided by third party commercial telecoms operators using dedicated copper cables. The commercial operators have decided to modernise their infrastructure to be IP enabled by 2025; this is known as the "PSTN switch off". This switch off will impact the whole of the UK.

5.268. For WPD, 4,947 third party telecoms connections will be affected and will need to be replaced with a suitable alternative. In WPD, PSTN connections are used for a variety of purposes including phone lines, alarm systems and CCTV systems at distribution asset sites.

5.269. WPD will migrate these affected and essential lines onto WPD's private network.

Fibre network expansion

5.270. WPD uses a combination of fibre optics and microwave for communications across our telecoms network. We will continue to use a combination of these but will increase the number of fibre optic installations, as these provide greater bandwidth.

5.271. WPD is proposing to expand the fibre optic network by taking advantage of outages and excavations for RIIO-ED2 planned overhead and underground asset replacement work.

5.272. This will enable new fibre connections to be made to strategic electricity assets. This efficient approach will target key electricity assets at existing works locations, introducing a technology mix of more fibre as an alternative to radio where it is cost effective to do so. This approach will also reduce the reliance on and costs associated with contracted services from third party telecoms operators.

Telecoms sites

5.273. The expansion of data acquisition and control will require the construction of additional telecoms sites to enable communications coverage where this does not currently exist.

5.274. Some existing sites will be refurbished to modernise the associated plant for enhanced cyber security and resilience to power failure.

Backhaul upgrades

5.275. WPD's communications rely upon an interconnected network of microwave links, fibre optic cables, terminal equipment and firewalls.

5.276. Some devices on the network need to be upgraded because they are either no longer supported or require a cyber security enhancement.

5.277. In other cases, extending the reach of the telecoms network will also require additional backhaul telecoms links to be installed.

Enabling whole system solutions

Benefitting our customers by using whole system solutions

5.278. We are committed to considering all options when developing our network, to make sure we deliver the most cost efficient and economical solution. This means regular liaison with other energy organisations to ensure our customers get the most cost effective solution to their energy requirements.

5.279. As the energy system evolves, there may be opportunities for solutions to be delivered by other organisations, where this is the most economical solution for the customer. This will involve greater collaboration with others across the wider energy industry, as well as with other utilities. It may also mean greater interaction with customers' systems where these can provide a benefit.

5.280. It is anticipated that most solutions we undertake will be related to electricity networks. This means we will invest in our network to assist the transmission system operator, or a transmission system investment could defer works required on our distribution network. However, other wider system benefits, such as those to gas networks and others will be considered were appropriate.

Regional Development Programs

5.281. The Regional Development Programs (RDPs) were set up to provide detailed analysis of areas of the network where there were known transmission / distribution network issues accommodating large amounts of Distributed Energy Resource.

5.282. This analysis is designed to innovate and push the boundaries of current thinking with a 'design by doing' approach to resolving issues. By focusing on a specific case study where there is a pressing need to improve outcomes for customers, it is possible to make faster progress.

5.283. The RDP process involves a number of stages before recommendations for future strategy can be made.

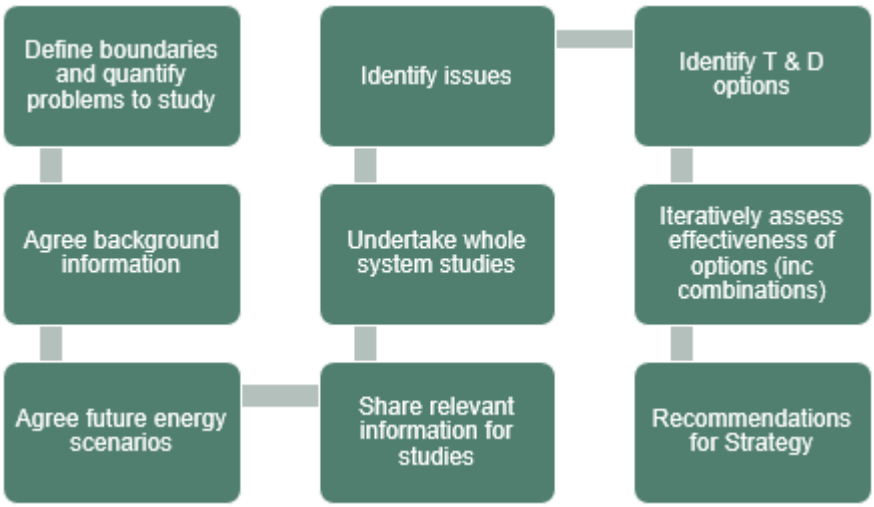


Figure 5.19 Regional Development Programs process

5.284. RDP2 was a joint study by the Electricity System Operator and WPD, focused on the South West. It concluded that an expected increase in renewables in the South West called for additional capacity for generation. It identified that flexibility was the most economical short-term solution and that generation 'turn down' products were needed to manage transmission constraints.

Other whole system activities

‘Accelerated Loss of Mains Change’ project

5.285. The Accelerated Loss of Mains Change project is being delivered by National Grid, DNOs and IDNOs to speed up compliance with new requirements in the Distribution Code on behalf of the Distribution Code Review Panel.

5.286. The project aims to address issues associated with Loss of Mains protection installed at distributed generation sites. The aim is to reduce the risk of inadvertent tripping and reduce system balancing issues.

Statement of Works Appendix G

5.287. Generators wishing to connect to WPD’s distribution system may have an impact on the transmission system. Under the Connection and Use of System Code, DNOs are required to make a request for a Statement of Works (SoW) to NGET when dealing with the potential impact of generation connections on the transmission system.

5.288. Due to the lengthy SoW process and cumulative impact of connecting large volumes of new generation to the distribution system, an alternative approach has been developed with NGET. This has resulted in a new trial SoW process known as the ‘Appendix G trial’.

5.289. We have been instrumental in trailing this new process and became the first DNO to have an Appendix G in place. The introduction of the Appendix G has reduced the time customers have to wait for the outcome of the process from around four months to six weeks.

RIIO-ED2 whole system actions

5.290. WPD will continue to explore whether there are activities that would benefit from whole system consideration. These may arise as a result of specific constraints on the network or from proactive coordination with other organisations.

Encouraging community energy projects

5.291. Community energy is the delivery of community-led renewable energy, energy demand reduction and energy supply projects, designed to address climate change. These projects may be wholly owned and/or controlled by communities or partnerships with commercial or public partners. These projects deliver social, environmental and economic benefits to the local community. These include helping to alleviate fuel poverty, encouraging engagement with energy issues, and generating community funds from renewable energy projects.

5.292. Our community energy organisations tell us their determination to deliver community energy projects is motivated by social and environmental values, rather than profit. They want a fairer energy system that doesn't leave the vulnerable behind, and a network that enables new community-owned generation to connect.

5.293. We want community and local energy to be a strong and resilient part of the energy sector. We are committed to ensuring our engagement with community and local energy stakeholders makes a positive impact, helping communities to collaborate with us and other local stakeholders.

5.294. We have implemented a Net Zero Communities Strategy which outlines our commitment to community energy and highlights the vital role of stakeholder engagement.

Community energy innovation activity

5.295. We've joined forces with communities on several network innovation projects. These partnerships help community and local energy organisations to develop new business models, and enable us to build a clearer understanding of the best way to manage a decarbonised and decentralised electricity system. As part of these initiatives, we aim to:

- Be ambitious in scope, while setting realistic timeframes for rolling out the project
- Make use of existing community organisations, structures and knowledge to understand the target audience and local impacts
- Work proactively with partners who are known and trusted in the local community
- Leave a lasting, positive impact on the community and share learning from the trial as widely as possible

5.296. Our extensive innovation programme has consistently ensured the delivery of a wide range of community energy focused projects. This is a summary of some of our key community focused innovation projects:

Smart Energy Isles	The Smart Energy Islands is an EU-funded project on the Isles of Scilly, aiming to build and operate a renewable energy microgrid to increase the amount of renewable generation on the islands. Our parallel, Smart Energy Isles project helped to increase the amount of renewable energy by enhancing an Active Network Management zone, so that generation can be better managed and allow local flexibility to offset generation curtailment.
SoLa Bristol	This project explored the impact of high densities of LCTs on our network and helped customers to manage their electricity load. Solar panels, energy storage, and DC circuits were trialled in homes to test their impacts and cost-effectiveness, with participants also trialling a time of use tariff.
Sunshine Tariff	A local community group WREN recruited 61 participants to trial Demand Side Response in Cornwall, which encouraged people to shift their electricity use to sunnier times of day with a cheaper daytime tariff, using renewable energy from local solar farms. The project aimed to resolve network capacity issues in the area to enable more community energy to connect.
Open LV	The Open LV project provided local electricity substation data to communities to help them understand the network and plan low carbon projects. Seven community groups took part, getting data from their local substations through a web application, to show

	local electricity use, generation, substation temperature, voltage level and carbon intensity of electricity
Cornwall Local Energy Market	This is an EU-funded project led by Centrica to create a local energy market and test flexible demand, generation and storage across homes and businesses. We contributed to this project through the Visibility Plugs and Sockets project, exploring the potential for DNOs to purchase flexibility through a third party. We wanted to reach different customers who might not engage through our own Flexible Power platform, to help them understand the kind of flexibility services we can buy from new customers, including domestic energy users. This project should improve our ability to provide flexibility services to domestic customers in the future.
Future Flex	This second-generation flexibility markets project aims to improve market design for smaller-scale and domestic customers, by better understanding the barriers in the process and increasing participation. This innovation project will make network flexibility services more accessible to homes and communities, such as groups of households with smart EV chargers, domestic electricity storage or smart, hybrid heating.

Figure 5.20 Community focussed innovation projects

Engaging with community energy groups

5.297. Our track record in this area has been proven by significant community energy engagement and support since 2014, resulting in the creation of 97 community energy groups across our four licence areas. This accounts for 43% of all community energy groups in the UK, and has facilitated the connection of 100MW of community-owned renewable electricity to our network.

5.298. Our approach to engagement is informed by feedback from community energy organisations, to ensure we are delivering the support communities want, and providing value for our customers. As a result, we've established a constructive, forward-looking and solutions-focused relationship with many community energy organisations. So far in RIIO-ED1 we have delivered 35 community events for more than 1,240 participants.

5.299. Our participatory engagement events aim to provide:

- Information on the latest developments in our changing energy system, such as connections, flexibility markets, support for vulnerable customers and innovation projects
- An opportunity to share learning amongst community groups about new business models and leading community energy projects
- Space for discussions so participants can ask questions, discuss innovative project ideas and give us feedback on the support they need next
- Informal networking at our community energy events
- Immersive learning experiences through site visits

Delivering for community energy schemes in RIIO-ED2

Providing support

5.300. We have provided support to communities and their representatives with the help of our accessible guides. Our 'Connecting Community Energy' guide is a 'how to' for any local energy group looking to develop its own renewable energy project and connect to our network. Supported by the Centre for Sustainable Energy, we developed our 'Community-Based Network Innovation' guide, which has supported our collaboration with community energy groups on several innovation projects with a total investment value of over £9m.

5.301. Some organisations prefer to discuss matters in more detail with our engineers. In response, we will implement Community Energy Surgeries in partnership with our local teams. These allow us to engage more closely with groups at the start of their journey and provide guidance on how best to connect to the network and operative efficiently and effectively.

5.302. We have seen an increase in the number of climate action groups and local authorities choosing to engage with us, as a result of climate emergency declarations. These new local energy stakeholders are working towards carbon reduction plans that will include new low carbon energy infrastructure. We want to support them alongside existing community energy organisations.

5.303. We are committed to continuing our leading edge engagement with communities and community energy groups. This will not only support the delivery of their ambitions but will maximise their support for a more dynamic and flexible network. This will give community energy groups the potential to provide significant localised energy balancing services, enabling us to further optimise the operation of the distribution network.

5.304. Community energy organisations face multiple barriers, including the lack of viable business models, a shortage of time and resources and the challenge of keeping up-to-date with the complex and fast-moving changes in our energy system. We recognise that we need to provide additional support to communities and local energy collaborators. We are committed to working closely with communities to support their goals.

5.305. This support will include ongoing engagement with community energy stakeholders. We will build on our existing community energy surgeries and programme of engagement, evolving our approaches to meet the changing needs of the various groups involved.

5.306. Stakeholders have told us they struggle to understand the complex nature of the energy system. In response, we will enhance our support for local energy groups by providing dedicated resources. A group of 'Community Energy Engineers' will provide a clear focal point to help communities develop and deliver their plans.

5.307. We will use these interactions to build a knowledge base for community energy development and share this knowledge throughout our business. This will enable us to implement community energy training to ensure that advice is being provided consistently.

5.308. Community energy stakeholders have limited resources and may not be able to contribute to industry consultations which places them at a disadvantage. To address this, we will ensure their interests and requirements are represented in the responses we provide. We will also ensure that relevant changes are communicated to community energy stakeholders in a simple and digestible way.

Innovation

5.309. Our innovation programme is designed to develop the solutions, skills and processes we need for a decarbonised and intelligent electricity distribution network that is affordable for all our customers.

5.310. During RIIO-ED1, our innovation programme transformed our network and enabled us to provide customers with better service, faster and cheaper network connections and opportunities to offer flexibility services. All of this was achieved as a result of solutions designed, implemented and successfully trialled as part of our innovation projects. For example, we are now able to offer our customers Flexible Connections using Active Network Management which means they can connect to our network in a way that is faster and cheaper than a conventional connection.

5.311. It is widely recognised that dedicated innovation funding over previous price controls allowed companies to embark on longer-term, energy system transition, whole system, or vulnerability-related innovation, delivering benefits both for the company and others.

5.312. In RIIO-ED2, we plan to continue transforming our network to achieve net zero while keeping our service efficient and affordable for all our customers. Building on our successes in RIIO-ED1, we will widen our innovation programme to continue developing the solutions for a sustainable and intelligent network, as well as demonstrating new ways to support our vulnerable customers through the energy transition.

5.313. Innovation will be used to ensure everyone benefits from the energy transition and no one is left behind.

5.314. Throughout RIIO-ED1,WPD has continued to provide additional funding to develop and test innovations, As well as contributing at least 10% to every project in the Future Networks Programme, we invest an additional £500k a year to support other projects and activities. These tend to be projects where the investment is too small to justify external funding or where we choose to secure the intellectual knowledge gained within our own business.

5.315. For RIIO-ED2, Ofgem is proposing to continue the Network Innovation Allowance (NIA), but will restrict eligibility to projects linked to the UK's net zero goals and consumer vulnerability. The Network Innovation Competition (NIC) will be replaced with a Strategic Innovation Fund (SIF). We will be actively seeking to secure funds from both the NIA and SIF throughout RIIIO-ED2 to continue our extensive innovation programme.

WPD's Innovation Strategy

5.316. It is important for any business to create the space for innovation and research.

5.317. Each year, we publish an Innovation Strategy. We do this to reflect rapidly changing external factors such as government policy, stakeholder priorities and to incorporate learning from the previous 12 months.

5.318. The strategy looks ahead to 2035, but provides more detail on shorter term priorities, requirements and proposed initiatives. Together with our Innovation Forward Plan, it gives details of the projects completed, ongoing and planned as part of the innovation programme.

5.319. It is available on our website at https://www.westernpower.co.uk/innovation/innovation-strategy.

Innovation programme delivery

5.320. Our small innovation team is dedicated to working with our business experts, external partners and customers to identify problems, find solutions and trial them through our innovation projects. To date, we have delivered more than 120 projects investing over £80m in innovation.

5.321. Team members are drawn from inside our own business, including a combination of more experienced employees and graduates, and from outside the organisation to bring in fresh ideas. They come from a range of backgrounds including active transmission networks, craft skills, data science, research science, project management and customer service.

5.322. Everything we do in our Innovation team is shaped by our three core values. These are:

Figure 5.21 Our Innovation core values

Our innovation commitments

5.323. Innovation has a crucial role to play in the decarbonisation of the energy system. We need to ensure that our electricity distribution network is able to meet the increasing demand from the electrification of heat and transport while also allowing the connection of more low carbon generation. We will continue to innovate to find novel ways of transforming our network efficiently and effectively and of operating it to meet these requirements.

5.324. We are committed to maintaining high standards of customer service, safety and reliability while keeping costs low for our customers. We will use innovation to achieve these aims and develop new technologies, commercial solutions and standards that will enable us to make the most of our existing network and assets.

5.325. The changes brought by the energy transition will create opportunities for everyone, making it even more important to ensure these opportunities are accessible to all. We will work with our communities to understand how best we can support our vulnerable customers and ensure that no one is disadvantaged.

Innovation in RIIO-ED2

Scope of innovation

5.326. We welcome the continuation of NIA funding and the introduction of the new Strategic Innovation Fund (SIF) for RIIO-ED2, which will support future-facing strategic challenges. These innovation funds will be targeted at projects linked to the energy system transition, focusing on key strategic challenges facing the future of power, heat and transport. Projects will also be carried out to address consumer vulnerability.

5.327. To allow continuity, RIIO-ED2 NIA funding will be utilised, if available, to contribute at least 10% to all projects. We will also seek project funding from national and international schemes. These include BEIS competitions, InnovateUK calls and initiatives connected to the Energy Systems Catapult.

5.328. During RIIO-ED2, we will develop a new interactive 'ideas portal' for staff, third parties, communities and other stakeholders to make their own suggestions for new projects. Where appropriate, we will make small grants to individuals or groups to progress an idea through feasibility assessment and to create of a high level project scope.

Developing solutions and policy

5.329. All projects will include representatives from outside the innovation team to ensure that new solutions can be safely implemented on the WPD network and integrated into our current processes and systems. They will work alongside the project manager to develop policy, operating standards and practices to provide the framework for replication.

5.330. The approach to roll-out will be developed as part of the project and detailed in project closedown reports. Where a new solution requires staff training, this will be identified, developed and trialled within the project.

Consolidating and sharing knowledge

5.331. Process and policy change is usually informed by a wide range of developments and trials. It is unusual for a single innovation project to develop a standalone new policy or process. More often, these developments will be informed by several projects across the innovation programme along with learning from other organisations.

5.332. We will continue to run effective dissemination events and openly publish reports. We will maintain a dedicated website for innovation projects. Project specific and programme level papers will be published for a variety of audiences. We will use CIRED, a forum where the international electricity community meets, as our main platform for sharing technical papers. While trade and mainstream press will be used to reach more general audiences.

Innovation engagement

5.333. Engagement on innovation takes many forms. It includes generic engagement with a wide range of stakeholders, specific engagement with the innovation community and targeted engagement on specific technical topics (e.g. by using expert focus groups).

5.334. The innovation team acts as a point of contact and informal advice for local groups and universities. This may involve attending community meetings or delivering lectures or tutorials for undergraduates and post graduate students. The team also responds to suppliers who ask for advice on developing their products, which may lead to collaborative work with WPD or suggesting collaboration partners.

RIIO-ED2 innovation themes

5.335. While the portfolio of innovation projects will be balanced as described earlier, there will be specific emphasis on the following themes during RIIO-ED2:

Decarbonisation	• Investigation and trial of new ways of reducing our carbon footprint in various areas of our business.
Communities and vulnerability	• Specific projects to support energy communities; • Initiatives focused on consumer vulnerability, solutions to ensure communities and vulnerable groups can access new energy services and markets.
Behavioural analysis and probabilistic planning	• Application of statistical research and analysis of consumer behaviours to inform planning and operations; • Transfer of techniques from other sectors such as defence and retail.
Digitalisation	• Use of analytics tools and application of data science; • Opening of data to authorised third parties and the general public; automation and artificial intelligence; • Application of ICT to all parts of the grid; • Secure, simple integration with customer end use / equipment; data collection and aggregation technologies including cyber security aspects. • This work area will build on the work of the Energy Data Task Force and the concept of presumed open data.
E-mobility	• Support the mass market adoption of electric cars and vans, using innovation to solve any issues which arise; • Further development of smart charging and V2G solutions (vehicle to grid technologies); • Develop further connection solutions for charging infrastructure as new technologies become available; • Exploration of solutions for heavy freight; • Inland and coastal shipping; technology tracking on on-vehicle technology for batteries and charging
Low Carbon Heat	• Projects developing and demonstrating innovative electric heat solutions; district heat; • Industrial waste heat; • Hybrid customer solutions; • Mass-market scale up of heat pump adoption; • Integration of heat flexibility and storage; • Inter-seasonal storage and market integration
Distributed Generation	• Technology tracking and integration of renewable generation in to the network; • Thin film PV and falling prices; • Rooftop and ground deploy technologies; • Integration with community and municipality local energy schemes.
High Voltage Power Electronics and Battery Storage	• Falling prices of power electronic equipment will make application at DNO level more cost effective; • Enhancement of EHV solutions and expansion to HV/LV networks; • Technology tracking for battery storage especially grid scale solutions used internationally
Flexibility services and Energy Efficiency	• Development of DSO flexibility products; • Expansion to lower voltage networks; optimisation techniques across multiple markets; • Introduction of distributed ledger and peer to peer trading; • Relationship of markets with Energy Efficiency solutions

Figure 5.22 Our RIIO-ED2 Innovation themes

WESTERN POWER DISTRIBUTION

Serving the Midlands, South West and Wales

Chapter 6

Proposed expenditure

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6. Proposed expenditure

Summary

6.1. RIIO-ED2 will be a period of significant change as the UK works towards achieving a net zero carbon future. Our expenditure plans reflect this challenge to deliver a network which meets future energy requirements, as well as ensuring we continue to deliver industry-leading service levels to customers at an efficient cost.

6.2. This chapter sets out our high level expenditure plans for 2023 – 2028 across all four licence areas.

6.3. We explain the reasons why costs are forecast to be different in RIIO-ED2 and compare the values to those being incurred in the current price control.

Costs included in this Plan

6.4. The costs presented and discussed are referred to as being part of 'Totex'. This means the licensee's total expenditure (with limited exceptions) on regulated business activities. 'Totex' includes both capital and operating expenditure items over which we have control and which are funded through the price control. The information is presented in alignment with the cost categories we report to Ofgem

6.5. The expenditure included in this document:

- Is stated in 2020/21 prices (current day prices)
- Is based on our current expenditure forecast, which may be revised ahead of final submission to Ofgem in December 2021 to take account of further analysis and stakeholder feedback
- Includes pensions costs (excluding established pension deficit repair payments), based on current actuarial projections

6.6. There are some costs which we incur outside Totex. These are either funded directly by customers or have specific 'pass through' arrangements because we do not have direct control over them. Because they are not funded through Totex, they are not included in this draft version of the Business Plan.

6.7. There are some expenditure areas where the requirement is yet to be decided though government/regulatory policy. Since the requirements are largely unknown, no cost forecast have been included. For example, this applies to areas such as the requirement for enhanced Black Start capability.

A summary of Total expenditure (Totex)

6.8. The table below compares our forecast annual average and total Totex costs for RIIO-ED2 against our average costs for RIIO-ED1.

6.9. We propose to spend £5.99bn during the five years of RIIO-ED2.

6.10. This is a 15% increase on the annual average expenditure in RIIO-ED2 and increases are seen in all four licence areas.

Totex					
£m, 20/21 prices	West Midlands	East Midlands	South Wales	South West	WPD Total
RIIO-ED1 Annual Average	320	313	160	252	1,046
RIIO-ED2 Annual Average (forecast)	355	353	186	305	1,199
RIIO-ED2 Total (5 years)	1,775	1,763	931	1,524	5,993

Figure 6.1 Our Totex expenditure

6.11. From the outset of RIIO-ED1, we have focused on delivering the outputs in our Business Plan, as well as delivering other activities not foreseen at that time (such as dealing with significant growth in distributed generation, establishing a Distribution System Operator (DSO) capability, producing the Distribution Future Energy Scenarios and adopting flexibility as an alternative to conventional reinforcement). We are expecting to end RIIO-ED1 with expenditure broadly in line with RIIO-ED1 allowances.

6.12. Our investment proposals for RIIO-ED2 continue to cover the delivery of core activities (such as asset replacement and resolution of faults), while also providing more network capacity to accommodate growth in low carbon technology and establishing enhanced DSO functions. Expenditure plans incorporate the utilisation of flexibility to minimise the need for costly reinforcement and an overall clear focus on business efficiency to keep bills as low as possible. The costs forecast also reflect the delivery of commitments developed through extensive stakeholder engagement described in Chapter 3.

6.13. The graphs below show a comparison between of this expenditure by activity area, showing the transition from annual average RIIO-ED1 expenditure to the projected annual average expenditure in RIIO-ED2.

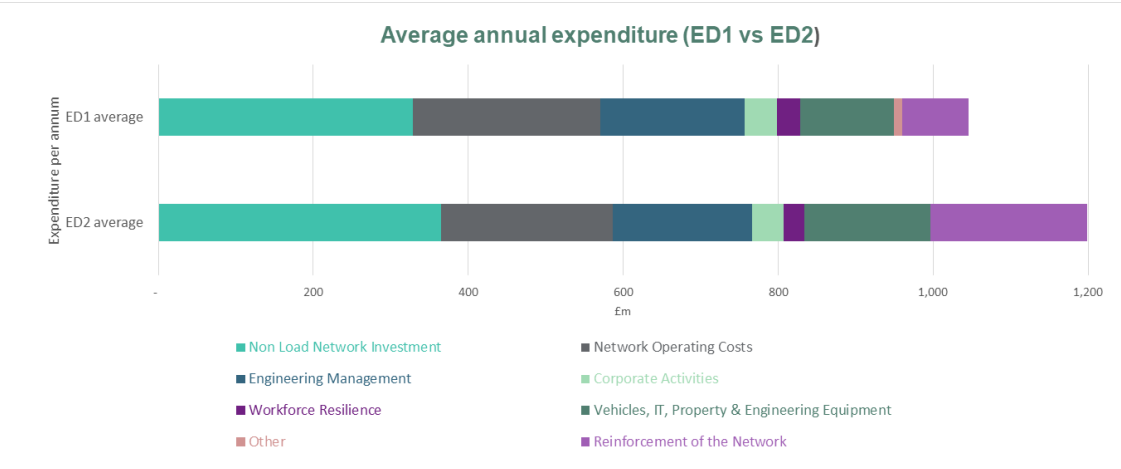

Figure 6.2 Average annual expenditure

6.14. WPD has a proven record of cost efficient delivery. The RIIO-ED2 Business Plan builds upon these existing efficiencies by factoring in further productivity and unit cost improvements.

Cost allocations

6.15. Cost accounting either uses direct booking of time and materials to specific activities for staff that work directly on delivery of projects or cost allocations for staff that are salaried. Since salaried staff do not complete time sheets, but can work on activities outside of Totex, part of their costs are reallocated outside the price control.

6.16. WPD's organisation for delivery of work on the network is set up using a geographical team structure. This means that a team has responsibility for all the main activities in its local area, including connections, maintenance, network investment and other non-price control work such as service alterations which are charged directly to customers. Each team member carrying out physical work on the network completes a timesheet so that the reason for the costs can be separately identified. This also applies to the cost of materials and the cost of using external contractors. This allows these costs to be directly attributed to a specific activity.

6.17. There are certain staff, covering engineering and corporate functions, who do not complete timesheets. This includes: engineering management, such as project management and clerical support, based locally; centralised engineering management teams carrying out studies for the development of the network; and corporate activities such as human resources. Some of these indirect staff support activities relating to Totex as well as activities classified as being outside the price control. To ensure that the appropriate costs are included in Totex and that the areas of work outside the price control are fully costed (including all indirect activities related to delivering this work), we undertake a process to allocate part of our indirect costs to this work outside the price control. This allocation is subject to an internal methodology, which is being fully reviewed and updated for RIIO-ED2.

6.18. All Totex costs shown in this document follow the allocation of indirect activities to non price control activities. However, where expenditure is presented by high level activity areas, this expenditure is shown before the impact of these indirect allocations (for example all Business Support corporate costs are included before a part of these is allocated outside the price control).

6.19. Corporate activities such as finance, IT and other activities, including the control centre and contact centre, are operated as shared activities across WPD licence areas, as this is judged to be the most cost effective way of working. Shared costs have been allocated across the four licensees using an approach which is consistent with the one followed in RIIO-ED1. This allocated the shared costs using the following proportions:

- 30% West Midlands
- 30% East Midlands
- 15% South Wales
- 25% South West.

WPD total core expenditure forecast

6.20. The tables below show the high level activity breakdown of the expenditure forecast to deliver our proposed business plan commitments. The activity costs are shown before allocations to activities outside the price control. Allocations and adjustments are shown separately to determine the Totex values.

6.21. The information is shown for WPD in total, as well providing details for each of the four licence areas

WPD core expenditure forecast

WPD Total - Expenditure funded through DUoS								
£m at 2020/21 prices	Average per year in RIIO-ED1	Average per year in RIIO-ED2	Spend profile in RIIO ED2					Total RIIO-ED2
			2023/24	2024/25	2025/26	2026/27	2027/28	
Reinforcement of the Network	83	200	153	167	197	222	258	998
Non Load Network Investment	334	370	367	376	389	364	353	1,849
Network Operating Costs	247	225	233	232	221	221	219	1,126
Engineering Management	232	241	242	240	241	241	241	1,205
Corporate Activities	50	49	49	49	49	49	49	246
Workforce Renewal	31	31	30	30	31	31	31	154
Vehicles, IT, Property & Engineering Equipment	141	188	182	196	184	183	194	940
Network Innovation Allowance	1	1	1	1	1	1	1	4
Atypicals	10	0	0	0	0	0	0	0
TOTAL EXPENDITURE	1,128	1,304	1,256	1,293	1,314	1,313	1,346	6,521
Indirect Allocations	-64	-88	-87	-88	-87	-89	-91	-441
Totex Adjustments	-18	-17	-17	-17	-17	-17	-17	-87
TOTEX	1,046	1,199	1,152	1,188	1,209	1,207	1,238	5,993

Figure 6.3 WPD RIIO-ED2 expenditure forecast

West Midlands core expenditure forecast

West Midlands - Expenditure funded through DUoS								
£m at 2020/21 prices	Average per year in RIIO-ED1	Average per year in RIIO-ED2	Spend profile in RIIO ED2					Total RIIO-ED2
			2023/24	2024/25	2025/26	2026/27	2027/28	
Reinforcement of the Network	28	63	44	45	62	74	89	314
Non Load Network Investment	99	107	107	111	112	105	103	537
Network Operating Costs	78	65	67	68	64	65	63	327
Engineering Management	72	76	76	76	76	76	76	380
Corporate Activities	15	15	15	15	15	15	15	74
Workforce Renewal	9	8	8	8	8	8	8	39
Vehicles, IT, Property & Engineering Equipment	39	52	48	52	51	49	59	259
Network Innovation Allowance	0	0	0	0	0	0	0	1
Atypicals	3	0	0	0	0	0	0	0
TOTAL EXPENDITURE	343	386	366	374	387	392	413	1,931
Indirect Allocations	-19	-27	-27	-27	-27	-27	-29	-137
Totex Adjustments	-4	-4	-4	-4	-4	-4	-4	-19
TOTEX	321	355	335	343	356	361	381	1,775

Figure 6.4 West Midlands RIIO-ED2 expenditure forecast

East Midlands core expenditure forecast

East Midlands - Expenditure funded through DUoS								
£m at 2020/21 prices	Average per year in RIIO-ED1	Average per year in RIIO-ED2	Spend profile in RIIO ED2					Total RIIO-ED2
			2023/24	2024/25	2025/26	2026/27	2027/28	
Reinforcement of the Network	36	59	46	53	61	63	73	297
Non Load Network Investment	90	106	106	107	113	103	101	530
Network Operating Costs	74	69	71	71	67	68	67	345
Engineering Management	72	75	75	74	75	75	75	373
Corporate Activities	15	15	15	15	15	15	15	73
Workforce Renewal	10	10	9	10	11	11	11	52
Vehicles, IT, Property & Engineering Equipment	39	53	51	57	50	51	57	266
Network Innovation Allowance	0	0	0	0	0	0	0	1
Atypicals	2	0	0	0	0	0	0	0
TOTAL EXPENDITURE	338	387	374	388	391	385	398	1,936
Indirect Allocations	-19	-29	-29	-29	-29	-30	-31	-147
Totex Adjustments	-6	-5	-5	-5	-5	-5	-5	-26
TOTEX	314	353	339	353	357	351	362	1,763

Figure 6.5 East Midlands RIIO-ED2 expenditure forecast

South Wales core expenditure forecast

South Wales - Expenditure funded through DUoS								
£m at 2020/21 prices	Average per year in RIIO-ED1	Average per year in RIIO-ED2	Spend profile in RIIO ED2					Total RIIO-ED2
			2023/24	2024/25	2025/26	2026/27	2027/28	
Reinforcement of the Network	7	32	28	28	30	33	40	158
Non Load Network Investment	55	55	54	58	59	54	53	277
Network Operating Costs	36	34	36	36	33	33	33	170
Engineering Management	35	36	36	36	36	36	36	180
Corporate Activities	8	7	7	7	7	7	7	37
Workforce Renewal	6	5	6	6	6	5	5	27
Vehicles, IT, Property & Engineering Equipment	26	31	31	33	31	32	30	157
Network Innovation Allowance	0	0	0	0	0	0	0	1
Atypicals	2	0	0	0	0	0	0	0
TOTAL EXPENDITURE	174	201	198	203	202	200	204	1,007
Indirect Allocations	-11	-12	-11	-12	-12	-13	-12	-60
Totex Adjustments	-3	-3	-3	-3	-3	-3	-3	-15
TOTEX	160	186	184	188	187	184	188	931

Figure 6.6 South Wales RIIO-ED2 expenditure forecast

South West core expenditure forecast

South West - Expenditure funded through DUoS								
£m at 2020/21 prices	Average per year in RIIO-ED1	Average per year in RIIO-ED2	Spend profile in RIIO ED2					Total RIIO-ED2
			2023/24	2024/25	2025/26	2026/27	2027/28	
Reinforcement of the Network	12	46	35	41	45	52	56	229
Non Load Network Investment	89	101	99	101	106	102	97	505
Network Operating Costs	59	57	59	58	56	56	56	284
Engineering Management	53	54	55	54	54	54	54	272
Corporate Activities	13	12	12	12	12	12	12	62
Workforce Renewal	7	7	7	7	7	7	7	36
Vehicles, IT, Property & Engineering Equipment	37	52	51	55	52	52	48	258
Network Innovation Allowance	0	0	0	0	0	0	0	1
Atypicals	3	0	0	0	0	0	0	0
TOTAL EXPENDITURE	273	329	319	328	333	336	331	1,647
Indirect Allocations	-15	-19	-19	-19	-19	-19	-19	-96
Totex Adjustments	-6	-5	-5	-5	-5	-5	-5	-26
TOTEX	252	305	294	304	309	311	306	1,524

Figure 6.7 South West RIIO-ED2 expenditure forecast

Cost and workload forecast considerations

6.22. WPD has been a consistently strong performer in the electricity distribution sector, operating a proven business model for many years. However, the environment in which we operate is changing rapidly as the UK moves towards net zero. Other developments, such as the shift towards greater digitisation, and the increased importance of cyber security have also heavily influenced our plan. While we expect to face many challenges and opportunities in RIIO-ED2, our strong business model provides the foundation for the efficient delivery of our plan.

WPD's 'Best View' for future network capacity requirements

6.23. We have used a wide range of sources to inform the current business plan projections for reinforcement activities. These include:

- UK government net zero aspirations and legislation, including the recent 10 Point Plan and Energy White Paper.
- Welsh government net zero aspirations
- Electricity System Operator – Future Energy Scenarios (ESO FES)
- Distribution Future Energy Scenarios (DFES)
- Local Area Energy Plans (LAEPs)
- ENA Common Scenario

6.24. These sources provide a series of scenario projections which have been consolidated to inform a WPD Best View, which has been used to develop our current forecasts. The current WPD Best View scenario indicates that there will be significant increases in demand due to the accelerated use of Low Carbon Technologies (LCTs). This will call for significantly increased levels of network reinforcement during RIIO-ED2 in comparison to previous levels of expenditure.

6.25. The current version of the WPD Best View and associated costs is based on the DFES published in 2019. Future expenditure forecasts will be based on the revised DFES which were published for stakeholder comment at the end of 2020.

6.26. Ofgem will provide a 'common scenario' for which we must produce a costed plan. This is expected to be issued towards the end of January 2021 (at about the same time as the publication of this draft business plan). The costs of delivering network capacity based on Ofgem's scenario will be included in future versions of this plan, in line with any further guidance from Ofgem on developing and presenting these forecasting scenarios.

6.27. This draft Business Plan presents the total costs which will enable us to deliver government and local authority objectives.

6.28. The approach to how these costs will be funded is still being determined by Ofgem. The way we have shown the costs assumes that full allowances will be provided at the start of the price control. This gives clarity on how much we expect the cost to be.

6.29. We recognise that various different proposals have been considered to manage the uncertainty of these costs and that some of these costs may ultimately be funded through volume drivers and uncertainty mechanisms. We will review the presentation of the cost forecasts following further guidance from Ofgem.

Access SCR

6.30. Our current WPD Best View may need to be updated as a result of the ongoing refinement of the charging methodology policy for Connections. Ofgem has deferred a decision on the Access and Forward-Looking Charges Significant Code Review (Access SCR), which means that it is unclear how the changes will affect funding requirements.

6.31. The amount of investment needed under RIIO-ED2 may need to change following the outcome of this review.

6.32. At this time, our RIIO-ED2 cost forecasts have been prepared on the basis of no change. However, once Ofgem has published its proposals, we will update our Business Plan to explain how our spending plans could be impacted by any changes in the Access SCR proposals, especially relating to costs and volumes of connections.

DSO and digitisation

6.33. We are building upon our traditional role of Distribution Network Operator (DNO) to incorporate Distribution System Operator (DSO) roles and functions. We believe that the adoption of DSO functions will be essential to driving performance and efficiency from our network and ensuring we can meet the future energy demands of all our customers.

6.34. Ofgem has identified three core DSO roles for RIIO-ED2: planning and network development; network operation; and market development. WPD has been developing DSO functionality in all three areas during RIIO-ED1 and we will continue to expand capability in these areas during RIIO-ED2. This will involve increasing data acquisition from the network, enhancing established DSO processes, developing new systems and sharing more data. These changes must be underpinned by greater data visibility and digitalisation of our processes and systems.

6.35. The costs and implications of carrying out DSO functions and increasing digitisation are fully embedded across all relevant activities in this plan. These changes are a natural extension of the functions we already perform which place us in a strong position to take on the role of Distribution System Operator.

6.36. The main cost impacts fall into the following areas:

- A separate management structure for DSO within WPD's existing organisational structure. This degree of separation will allow network strategy teams to carry out independent scrutiny of network investment options and help to create a neutral market place for flexibility. This structure is already in place, but will develop further in RIIO-ED2, as DSO functionality grows
- More comprehensive network strategy planning processes. WPD has already committed to producing a full suite of DFES analysis and documents each year and has been working with local authorities to understand Local Area Energy Plans.
- Adoption of 'flexibility first' considerations for network reinforcement, expanding the flexibility market and supporting the provision of flexibility services.
- Enhanced data collection and greater data visibility to allow better decision making. Investment is included to ensure we have the right systems and infrastructure in place.
- Development of operational systems to meet our DSO and digitisation objectives, which will include both enhancements to the existing applications and development of new systems to interact with the existing control systems. The main focus will be on higher network voltages, along with increased amounts of data and visibility of network operation implemented for lower voltages.
- Increase investment in cyber resilience and security to prevent possible future security breaches to the electricity distribution network through IT and OT Systems, especially where these systems are expanded to increase network monitoring and control. Focus will be on updating old 'legacy' IT and OT systems and ensuring that all systems and technologies are designed and implemented with the relevant level of cyber security controls.

Risk and asset strategy

6.37. We have an extensive network of assets, spread across a large geographical area, providing supplies to 7.9 million consumers. This vast network must be kept in good working order to prevent the assets failing. We regularly inspect and maintain our assets, gathering information about their condition, as part of the process. The assets in poorest condition are replaced to manage the risk on the network.

6.38. Asset-based risk is considers the probability that an asset will fail (based on its condition) alongside the consequences of that failure (taking into account safety, the environment, impact on customer service and cost of rectification). The industry uses risk measures to gauge asset health and criticality; For RIIO-ED2, these will be based upon Network Asset Risk Metrics (NARMs) which allow assets to be classified into different levels of health and criticality. Those with the poorest health and highest criticality carry the greatest risk. Because every asset has its own risk value, NARMs enables us to generate an overall risk measure for all the assessed assets.

6.39. Without intervention, the overall risk to the network would increase as the network deteriorates. Our asset replacement actions remove higher risk assets, which eliminates risk from the network. The resultant level of risk depends on the overall age and condition of the network. For example, a network with a lot of new assets requires less replacement activity and therefore may result in a higher network risk, while a network with many older poor condition assets requires more work which could lead to a lower resultant risk.

6.40. Our strategy for managing condition-based risk is not about reducing or increasing network risk; it is about doing what is necessary to remove poor condition assets. This means that poor condition assets, or those predicted to be in poor condition, drive the work programme. The resultant network risk will reflect this programme.

6.41. The processes for NARMs are currently being implemented. Further details will be provided in future versions of the business plan.

Our proven delivery record

6.42. WPD's established organisational structure is key to our proven track record of delivering on customer service and our work programme commitments. This in-sourced team-based structure provides a great foundation for the successful delivery of our investment programmes for RIIO-ED2.

6.43. We have a strong belief that the use of in-house regional resources is crucial to cost effective, efficient delivery, which is why we use geographically based teams to serve each local area. Our staff know the local area, the local network and local developments, enabling us to provide efficient, high quality customer service. The organisational structure is flat, with devolved decision-making and minimal bureaucracy. This structure and ethos will continue to be a core part of our delivery model for RIIO-ED2.

6.44. The biggest change to our organisational structure will be an increase in the staff and systems needed to deliver our DSO and digitisation targets. We will apply the same principles, of minimal bureaucracy and a culture of delegated personal responsibility, when introducing these developments.

Innovation

6.45. We are committed to harnessing innovation to introduce new techniques, improve the way we operate the network and develop new services for vulnerable customers. We're also using innovation to identify efficiencies and provide value for money to our customers.

6.46. We will continue to collaborate with third parties and fully participate in Ofgem's Strategic Innovation Fund and the Network Innovation Allowance. We will also support other research, development and demonstration projects, which fall outside the scope of Ofgem's Innovation mechanisms.

Purchasing strategy

6.47. Contract and material tendering is the most frequently used method of purchasing goods and services throughout WPD. Tenders are conducted in accordance with appropriate legislation by our purchasing team, who are fully embedded within the business to deliver the most strategically and commercially advantageous contracts for us.

6.48. Our purchasing strategy is to multi-source goods and services, not only to protect the business from a single point of supply failure but also to encourage competition. Where appropriate, we tender goods and services through 'Lots' which may be applied across all four licence areas or split into smaller geographical areas. By using this approach, we can procure the most economically advantageous contracts which deliver value to us and our customers.

Regional factors

6.49. We distribute electricity to a wide range of different areas, including:

- Densely populated urban areas in of Birmingham and the West Midlands
- Large cities including Bristol, Cardiff, Nottingham, Derby, Leicester and Stoke
- Sparsely populated rural areas in Lincolnshire, Herefordshire, Cornwall and South Wales

6.50. Each location has its unique challenges. For example, travel times can vary significantly, due to a shortage of direct routes in more rural areas and the effect of traffic congestion in major cities.

6.51. Many local authorities in our licence areas have their own net zero plans, which will drive different paces of change and levels of investment on the network.

6.52. We operate a consistent pay structure across WPD. For example, overhead linesmen are all on the same pay grade, terms and conditions, irrespective of whether they are based in Cornwall, urban Birmingham or rural Lincolnshire.

6.53. There may be some regional variations in contract prices, through the selection of best rates for different regions; these differences are factored into our plans and unit costs where applicable. Differences in other areas, such as payments related to the operation of different pension schemes (especially older schemes), are also included in our plans.

6.54. On balance, we consider the mix of differences within WPD does not necessitate any specific locational or regional adjustments to our expenditure plan.

6.55. However, we do expect Ofgem to 'normalise' factors outside DNOs' control and will continue to participate in ongoing discussions with Ofgem to determine how these are best addressed. An example of this is street works costs. In most local authority areas, permitting schemes are in place but may impose different working practices in different areas; this may call for some benchmarking adjustments across company plans by Ofgem. This plan has embedded costs where these schemes are already in operation, and has not yet accounted for new schemes. We expect that the costs associated with new schemes will be covered by an uncertainty mechanism.

Reinforcement of the network

6.56. Load-related investment is expenditure incurred when providing additional capacity on the network to facilitate new connections as well as load growth. This covers both demand and generation. Load-related reinforcement investment falls into four categories: connections, general reinforcement, fault level and new transmission capacity charges. The annual expenditure in all four category areas is expected to increase during RIIO-ED2, despite a significant increase in the use of flexibility to offset traditional reinforcement.

6.57. Reinforcement will increase from 7% of Totex as an average in RIIO-ED1, to 10% of Totex in the last year of RIIO-ED1, and then to 15% in RIIO-ED2.

6.58. The main reason for higher load-related expenditure is the government's 2050 net zero target, which is driving significant growth in low carbon technologies, such as electric vehicles, heat pumps, storage and distributed generation. This is exacerbated by the ambitious local development plans of many local authorities in our region which feature commercial, industrial and housing developments.

6.59. To ensure we meet these demands, we've used numerous data sources, including national forecasts of growth by the Electricity System Operator and local information about regional aspirations, to establish our WPD Best View of anticipated future network loads and constraints.

Reinforcement of the Network					
£m, 20/21 prices	West Midlands	East Midlands	South Wales	South West	WPD Total
RIIO-ED1 Annual Average	28	36	7	12	83
RIIO-ED2 Annual Average (forecast)	63	59	32	46	200
RIIO-ED2 Total (5 years)	314	297	158	229	998

Figure 6.8 Reinforcement expenditure

Our forecasting approach

6.60. The WPD Best View was created from Distribution Future Energy Scenarios (DFES) studies for each licence area, which capture the growth projections for different technologies in the next 15 years. The DFES framework follows four scenarios aligned to the National Grid Future Energy Scenarios framework. This accounts for the growth of:

- Low carbon technologies such as electric vehicles and heat pumps
- Distributed generation and storage technologies to further exploit the UK's renewable energy potential
- 'Conventional' demand, such as new domestic, industrial and commercial developments as outlined in local plans

6.61. Each of the technology types featured in the WPD Best View was given an electrical profile, to plot the expected impact on the WPD network. The profiles were compiled using metering data for existing customers and synthesised data from innovation project trials, led by various DNOs.

6.62. The forecasting process produces a set of growth rates, which were overlaid onto a power system model of the primary network to identify which areas of the network would need reinforcement during RIIO-ED2, and when this would need to happen. The data was then disaggregated down to the LV and HV network level and loaded into a network modelling tool, Network Investment Forecasting Tool (NIFT), specifically developed for WPD by EATL to identify the LV and HV network reinforcement requirements. NIFT incorporates a model of WPD's LV feeders and HV transformers using WPD asset and geographic data, and maps the forecast localised demand and DER growth from the 'WPD best view' scenario on to these simulated networks to identify where and when additional capacity will be required.

Flexibility

6.63. We have made significant progress in our ability to operate the network more flexibly, balancing sources of supply and demand in real time to avoid the need for costly reinforcement, where possible. This includes local management of generation output, load and power flows.

6.64. We anticipate that the use of flexibility will increase during RIIO-ED2 although it is not expected that the market will be able to provide services to match all constraints. Our 'flexibility first' approach means that, for all reinforcement issues, we consider whether flexibility is a credible option to address network issues and avoid reinforcement.

6.65. We have identified 55 potential schemes (of 139 on the initial primary reinforcement list) where we anticipate that flexibility will defer the traditional investment scheme beyond the RIIO-ED2 period. The total deferred investment is estimated at over £150m.

Connections related reinforcement

6.66. When new connections are made to the network there is sometimes a requirement to increase the capacity of the existing network. Connecting customers directly fund the assets that will be for their sole use and a proportion of the reinforcement costs, determined by rules specified by connection charging statements. The remainder of the reinforcement costs is funded through the price control because it provides capacity that can be used by other customers. This is known as DUoS funded reinforcement. We have used the growth projections from the WPD Best View to determine the volume of new connections and the associated reinforcement requirements.

General reinforcement

6.67. General reinforcement is the investment required to provide adequate capacity on the network for generic load growth (i.e. it is not related to any individual customer or new connections).

6.68. General reinforcement enables WPD to fulfil its obligation to provide adequate network capacity to meet network security standards and ensure that the voltage of the network remains within statutory limits. These obligations are found in the Electricity Networks Association Engineering Recommendation for Security of Supply P2/7, which specifies the expected capability of the network to meet demands under defined outage conditions, and the Electricity Supply Quality and Continuity Regulations (ESQCR), which defines voltage limits.

6.69. General reinforcement is split into two categories: secondary network reinforcement which covers the low voltage (LV) and high voltage (HV) networks and primary network reinforcement, which covers the EHV (33kV and 66kV) and 132kV networks.

LV and HV forecasts (High volume - low cost)

6.70. WPD's NIFT modelling tool has been used to identify the reinforcement requirement at LV and HV. To produce expenditure forecasts, annual volumes of interventions from NIFT were multiplied by costed standard projects. For LV circuits, the unit cost of a typical circuit scheme was used. To produce the HV substation forecast, assumed standard interventions, built using asset replacement unit costs, were applied to the forecast volumes of transformer upgrades.

6.71. To better manage future load growth and reinforcement requirements, we are planning to install increased amounts of LV Monitoring. This monitoring will provide greater visibility of the loads and voltage on the network; allowing pro-active measures to be taken in real time, providing verification of modelled and smart meter information and giving more accurate view of reinforcement requirements. The locations for installation will be prioritised based on existing knowledge of heavily loaded circuits alongside analysis of smart meter data which will be used to provide an insight into where the network may be reaching capacity. We anticipate that the improved and more accurate data will enable better management of reinforcement activity, allowing some to be deferred.

EHV and 132kV forecasts (Low volume - high cost)

6.72. The WPD Best View has been used within detailed network analysis to identify potential circuit and transformer overloads as well as voltage excursions outside statutory limits at both the EHV and 132kV levels.

6.73. For each network constraint, the optimum reinforcement scheme was then identified after evaluating a range of options and their associated costs which included the assessment of using flexibility as an alternative to conventional reinforcement.

Fault level reinforcement

6.74. Certain faults on the network can cause very high current to flow until the network is switched off automatically by circuit breakers. The network is designed to withstand these fault levels, but the number of generators and large induction motors connected to the network can cause the fault current to exceed the rating of the circuit breakers, overhead line and cables. This can introduce a risk of catastrophic failure to the overhead lines and cables, or when the switchgear is operated.

6.75. We have a duty of care for our employees and members of the public to ensure they are not at risk of injury due to the failure of the company's assets and therefore when new high fault level situations by applying operational limitations. Because these involve sub-optimal running arrangements, they are only used as interim solutions until the equipment can be changed. The implementation of sub-optimal network running arrangements can affect network performance and constrain the capacity of the network, restricting the connection of additional load or generation.

6.76. Situations like this are typically resolved by replacing switchgear and overhead lines and cables with higher rated assets. In some cases, fault levels can also be reduced by changing transformers for higher impedance models. Smart interventions, such as the use of fault current limiters, are also applied where this is an economical solution.

6.77. A significant factor in increased fault levels is the connection of distributed generation. The growth in distributed generation is expected to continue into RIIO-ED2, resulting in an increase in fault levels on parts of the network.

6.78. Eleven fault level schemes have been identified during the RIIO-ED2 period across WPD. These have been developed by:

- Identifying all sites which have a current switchgear duty of 90-95% of rating.
- Undertaking further analysis of these substations to identify the projected growth in fault levels over the RIIO-ED2 period in line with the WPD Best View scenario.
- Considering whether fault levels could be reduced by altering network running arrangements or whether network investment was the most appropriate solution.

New transmission capacity charges

6.79. WPD interconnects to the transmission network reinforcement, typically at the Grid Supply Points (GSPs) which are 400/132kV or 275/132kV interface substations between the transmission and distribution networks.

6.80. Load growth on the distribution networks may necessitate extra capacity to be provided from the transmission system. This work is carried out by National Grid and the costs recharged through exit charges. Where these exit charges are linked to load related requirements they form part of the costs within the price control Totex.

6.81. Eight GSPs have been identified as sites for reinforcement during RIIO-ED2. We plan to use flexibility to address issues at three of these sites removing the need for reinforcement, while conventional reinforcement by National Grid is required for the other five GSPs.

Non load related investment

6.82. Non load-related investment encompasses a broad range of activities linked to the replacement and refurbishment of assets, as well as improving safety, reducing environmental impact, improving network performance and investing in new enhanced IT and telecoms for operating the network. This section focuses on the activities associated with highest expenditure and/or most change.

6.83. Through RIIO-ED1 and RIIO-ED2, this area represents around 30% of Totex.

Non Load Network Investment					
£m, 20/21 prices	West Midlands	East Midlands	South Wales	South West	WPD Total
RIIO-ED1 Annual Average	99	90	55	89	334
RIIO-ED2 Annual Average (forecast)	107	106	55	101	370
RIIO-ED2 Total (5 years)	537	530	277	505	1,849

Figure 6.9 Non Load Network Investment expenditure

Asset replacement

6.84. Asset Replacement is the largest area of expenditure in non-load network investment, both in RIIO-ED1 and into RIIO-ED2. Our replacement strategy, which focusses on removing assets in poorest condition, is not changing which means that total replacement expenditure will remain broadly the same in RIIO-ED2.

6.85. We use a range of modelling techniques to determine the volumes of replacement activity required, including:

- Network Asset Risk Metrics (NARMs)
- Statistical age-based modelling
- Run-rate analysis
- Population impacted analysis
- Bespoke programmes

6.86. Current analysis suggests that, while overall costs will remain broadly the same, the level of activity will vary between asset categories. For example, replacement volumes of switchgear (particularly at HV) will be lower in RIIO-ED2 and more LV consac cable will be replaced to reduce the higher fault rate and inconvenience to customers.

6.87. Generally, assets will be replaced on a like-for-like basis using modern equivalents, although larger capacity assets may be used either to reduce network losses or to take account of anticipated load growth. The anticipated load growth from the increased uptake of low carbon technologies (electric vehicles and heat pumps) means that consideration will be given to installing greater capacity assets where there is a strong indication that load growth will take place. This incremental reinforcement should negate the need for subsequent reinforcement as load increases, meaning that assets are only 'touched once' before 2050. The small incremental increase in material costs will reduce long term costs particularly for cable assets, where the majority of the costs arise from excavation and reinstatement.

Operational IT and Telecoms

6.88. Operational IT and Telecoms is the area where we expect to see the biggest increase in activity. This encompasses the dedicated communication infrastructure and network management system, which monitors the electricity network, controls load flows and enables response to faults.

6.89. We are forecasting additional expenditure in the following areas:

- Control systems, as a result of the development of our DSO capabilities
- Sensing and monitoring required on the network, including power quality monitoring and distributed energy resource SCADA monitors
- Remote Terminal Equipment (RTU) replacement programme to replace end of life units with Internet Protocol enabled RTUs.
- Modernising WPD's radio based telecoms system to a Long Term Evolution (LTe) (this development is currently under review with Ofcom and may be funded through a future uncertainty mechanism rather than upfront allowances).
- Cyber resilience for Operational IT and Telecoms to meet an expected growth in cyber security risks.

Diversions

6.90. Diversions activity is predominantly driven by third party requirements. For most activity areas, forecasts are based on trends in costs and volumes from RIIO-ED1. However, an increase has been included for LV, due to the issue of wood poles in gardens. Since the start of RIIO-ED1, WPD has experienced a significant rise in wood pole claims activity, largely driven by the marketing activities of compensation agents. This was not foreseen before the start of the RIIO-ED1 and, as a result, has been reported in atypical costs during the period. For the RIIO-ED2 forecast, these costs are now included in diversions as an ongoing activity.

Overhead line clearances

6.91. We have obligations to ensure that overhead lines have sufficient clearance to objects, buildings and the ground. Detailed survey work has identified that there are a number of low ground clearance issues that need to be resolved.

6.92. The volume of activity expected during RIIO-ED2 is based on known issues and a forecast of the number of additional issues that may be identified during future inspections. The existing work programme is built around risk-based timescales depending on the current height of the conductors, with the majority of the work to be completed by 2029.

Environmental

6.93. Our Environmental Action Plan and core commitments list a range of activities designed to proactively reduce leaks from network equipment. We also need to comply with all applicable new environmental legislation. A number of programmes will be in place to achieve these objectives, including the removal of all PCB contaminated equipment from the WPD network by 2025 and the use of techniques to reduce fluid filled cable network leaks by 30% compared to RIIO-ED1.

Other

6.94. Our Legal and Safety programme is relatively small but includes new expenditure to deal with safety risks associated with overhead lines that either cross or run adjacent to schools and playing fields.

6.95. There are some programmes where we have been unable to forecast additional costs, because of uncertainties beyond our control. This includes expenditure on enhancing Black Start capability (which is awaiting government requirements) and diversions required to accommodate planned rail electrification. We expect any future expenditure in these areas to be covered by uncertainty mechanisms.

Network Operating Costs

6.96. Network Operating Costs (NOCs) are collectively associated with faults, severe weather response, inspection and maintenance, and tree cutting activities. In RIIO-ED1, NOCs form about 22% of Totex but, due to ongoing efficiency initiatives will make up only about 17% of Totex in RIIO-ED2.

Network Operating Costs					
£m, 20/21 prices	West Midlands	East Midlands	South Wales	South West	WPD Total
RIIO-ED1 Annual Average	78	74	36	59	247
RIIO-ED2 Annual Average (forecast)	65	69	34	57	225
RIIO-ED2 Total (5 years)	327	345	170	284	1,126

Figure 6.10 Network Operating Costs

Headlines

6.97. We will continue to challenge costs in this area, while maintaining the high level of service our customers expect.

6.98. We currently forecast a reduction of around 10% in fault costs into RIIO-ED2. This is due to progressive reduction in the number of faults as a result of various business initiatives and a focus on reducing unit costs. However, response to faults will remain a high priority, ensuring that customer supplies are restored as quickly as possible.

6.99. WPD will continue with programmes of routine tree clearance and tree resilience clearance. Routine clearance cycles will be carried out across all voltage levels. However, there will be a gradual change in the approach to routine clearance at HV and EHV, moving away from the use of contractors to manage clearance requirements to a WPD-directed approach, using data from Light Detection and Ranging (LiDAR) analysis. This will improve the effectiveness of tree clearance and lead to lower costs in the future. Resilience clearance will be focused on EHV networks with completion of all EHV initial clearance in RIIO-ED2.

6.100. In RIIO-ED2, the vast majority of inspection and maintenance cycles will remain unchanged. However, there is an increased requirement for cut-out inspections, as it is expected that DNOs will carry out inspections following the roll-out of smart meters (an activity which is currently fulfilled by suppliers and their meter operators). Costs have been included in the forecast for this additional activity.

Engineering management

6.101. The physical work we do could not go ahead without the support of indirect activities, such as planning, project management, system records and stores. This activity also includes wayleave payments, which are payments made as compensation to landowners and occupiers for losses associated with WPD's apparatus on private land.

6.102. These costs form about 21% of Totex in RIIO-ED1 and about 18% of Totex in RIIO-ED2.

Engineering Management					
£m, 20/21 prices	West Midlands	East Midlands	South Wales	South West	WPD Total
RIIO-ED1 Annual Average	72	72	35	53	232
RIIO-ED2 Annual Average (forecast)	76	75	36	54	241
RIIO-ED2 Total (5 years)	380	373	180	272	1,205

Figure 6.11 Engineering Management expenditure

Headlines

6.103. We are not proposing changes to the core DNO organisational structures in RIIO-ED2. Savings made during the latter part of RIIO-ED1 are expected to offset some of the costs of increasing volumes of work in RIIO-ED2. However, there are a number of areas where we are forecasting change.

6.104. The significant increase in reinforcement activities will require additional indirect activity in areas such as detailed project design and project management activities (covering all phases from project authorisation, work preparation, construction and physical connection through to ensuring all technical records and projects costs are updated). Additional costs have been included in the forecast for these increased activities.

6.105. Many DSO functions will be carried out by teams and processes that form part of engineering management teams. We are forecasting the need for some additional staff to cover these new processes, as well as to support the move towards digitalisation and increasing data policy and management. We are also proposing to introduce community energy engineers to support local community energy projects.

6.106. We are predicting a small increase in call centre handlers to help uphold our PSR commitments. This is in response to an expected growth in the number of customers joining our PSR during RIIO-ED2 and our pledge to make sure vulnerable customers are not left behind in the DSO transition. All other proposed customer service commitments will be delivered through current cost levels.

6.107. As part of our commitment to innovate, a small amount of additional innovation spending has been forecast to cover projects that will no longer be eligible under the Network Innovation Allowance (NIA). This includes projects which explore technological advances to network assets, support community energy projects and non-carbon related environmental benefits

6.108. We currently forecast that wayleave payments will be relatively consistent into RIIO-ED2. Wayleave payment rates are negotiated annually by the Energy Networks Association with the National Farmers Union, Farmers Union of Wales and the Country Landowners Association and we anticipate these to remain relatively stable.

Corporate activities

6.109. Corporate activities include a number of central functions across all licence areas, including human resources, finance and regulation, procurement, corporate communications, legal services and executive functions.

6.110. WPD's aim to operate a low overhead business will not change as we enter RIIO-ED2. Corporate activities account for about 4% of Totex.

Corporate Activities					
£m, 20/21 prices	West Midlands	East Midlands	South Wales	South West	WPD Total
RIIO-ED1 Annual Average	15	15	8	13	50
RIIO-ED2 Annual Average (forecast)	15	15	7	12	49
RIIO-ED2 Total (5 years)	74	73	37	62	246

Figure 6.12 Corporate Activities expenditure

Headlines

6.111. Although there will be increased requirements in some of these areas as we expand DSO capability and carry out additional reinforcement programmes, these will be absorbed within existing resources, thanks to process improvements and efficiencies.

6.112. We also forecast some additional expenditure for increased social outreach projects for vulnerable customers. We will continue to offer fuel poverty advice, along with new projects to protect vulnerable customers in a smart future.

Workforce resilience

6.113. Working and operating on the electricity network requires staff to be fully trained and competent to undertake the required activities safely following prescribed procedures. The adoption of more smart ways to operate the network and manage data will call for new skills, as well as the recruitment and training of appropriately skilled staff.

6.114. The costs of training staff form about 2% of Totex.

Workforce Renewal					
£m, 20/21 prices	West Midlands	East Midlands	South Wales	South West	WPD Total
RIIO-ED1 Annual Average	9	10	6	7	31
RIIO-ED2 Annual Average (forecast)	8	10	5	7	31
RIIO-ED2 Total (5 years)	39	52	27	36	154

Figure 6.13 Workforce Resilience expenditure

Headlines

6.115. Our existing apprenticeship, skills trainee, graduate and technical staff trainee programmes have enabled us to maintain the right number and mix of staff to deliver our programmes of work successfully. We expect the development of these trainee programmes will continue to deliver the right outcomes for us during RIIO-ED2.

6.116. To train additional staff, we are able to adapt existing space to create extra workshops and classrooms in our training centres and satellite facilities. We have a proven record of being able to recruit and 'train the trainer' and have continued to run a significant apprentice programme since DPCR3 (2000-2005).

6.117. WPD will continue to invest in staff development in RIIO-ED2. Our workforce renewal programme for RIIO-ED2 will continue to make sure our staff have relevant skills in the evolving energy sector, such as DSO and commercial skills, as well as core engineering expertise. WPD is committed to achieving the Investors in People (IIP) award, gaining at least silver accreditation. Our strategy will also focus on enhancing gender and BAME representation, and driving benefits from a more diverse workforce.

Vehicles, IT, property and engineering equipment

6.118. This section covers the capital purchase of non-network assets and associated running (opex) costs to support these assets including:

- Purchase of vehicles and associated running costs (e.g. fuel, vehicle maintenance)
- Purchase of non-operational IT systems and equipment (business systems that are not primarily used in the real time management of network assets) and associated running costs
- Purchase and refurbishment of non-operational property (such as local depots and corporate offices) and running costs of existing property
- Purchase of small tools, equipment, plant and machinery

6.119. Due to the expanded importance of these areas these costs will represent 14% of Totex in RIIO-ED2, increasing from 12% in RIIO-ED1.

Vehicles, IT, Property & Engineering Equipment					
£m, 20/21 prices	West Midlands	East Midlands	South Wales	South West	WPD Total
RIIO-ED1 Annual Average	39	39	26	37	141
RIIO-ED2 Annual Average (forecast)	52	53	31	52	188
RIIO-ED2 Total (5 years)	259	266	157	258	940

Figure 6.14 Vehicles, IT, Property and Engineering Equipment expenditure

Operational vehicle fleet

6.120. In line with our core commitments, we will replace 79% of our existing commercial van vehicle fleet with electric vehicles by 2028. While the market prices for electric vehicles are currently higher than those for diesel models, there are clear environmental benefits, as well as lower fuel and maintenance costs.

6.121. We will also replace at least 50 of our worst polluting mobile generators during RIIO-ED2, as part of our commitment to net zero. These will be replaced with modern, more efficient, improved emission versions.

Non-operational IT and Telecoms expenditure

6.122. We are forecasting additional non-operational IT expenditure, associated with:

- Development of our DSO capabilities which includes data & digitalisation and network analysis requirements
- Proposed fibre network expansion to strengthen telecoms resilience in light of the growing demands for real time data collection and transmission back to control
- Construction of additional telecoms sites and refurbishment of others to extend remote control and monitoring functionality of the electricity network
- Upgrading of backhaul network facilities
- Cyber resilience IT to tackle an expected growth in cyber security risks, including a new data centre security upgrade (associated property costs are also included in the forecast).

6.123. IT and Telecoms running costs will also increase. We are forecasting additional expenditure in the following areas:

- IT infrastructure hardware and software maintenance and support costs associated with the development of our DSO capabilities
- Business applications growth resulting in the increased requirement for hardware and software maintenance
- Increased number of IT staff, including those to join our cyber security team, to ensure we remain able to meet increasing demands for more complex IT systems
- IT cyber resilience maintenance costs, including IT security software and hardware maintenance and system penetration testing.

Property

6.124. WPD has a property portfolio of 63 non-operational sites and 31 garages. Ownership is a combination of freeholds and leaseholds, with significant variation in the age of buildings. Work has begun to assess potential construction and refurbishment requirements in RIIO-ED2, as well as installation of renewable local generation at all sites.

Other costs within the price control

6.125. These costs include innovation and atypical costs.

Other Costs Within Price Control					
£m, 20/21 prices	West Midlands	East Midlands	South Wales	South West	WPD Total
RIIO-ED1 Annual Average	4	2	2	3	11
RIIO-ED2 Annual Average (forecast)	0	0	0	0	1
RIIO-ED2 Total (5 years)	1	1	1	1	4

Figure 6.15 Other Costs expenditure

6.126. Innovation is primarily funded through the Network Innovation Allowance (NIA) and Network Innovation Competition (NIC) with the NIC being replaced by the Strategic Innovation Fund in RIIO-ED2). DNOs fund approximately 10% of the costs, which are included in Totex as part of Other Costs.

6.127. For RIIO-ED2, Ofgem is proposing to continue its NIA funding, but restrict eligibility to projects which advance the UK's net zero goals and tackle consumer vulnerability. WPD plans to play an active part and will continue to invest in these innovation activities. RIIO-ED2 expenditure is likely to be fairly consistent with RIIO-ED1 levels

6.128. Additional investment will also be specifically targeted at projects which promote technological advances to network assets, support community energy projects and explore non-carbon related environmental benefits. As these will not be eligible for NIA, these are forecast in Engineering Management.

6.129. No costs have been forecast for the Strategic Innovation Fund. This is a competitive process across the wider industry and difficult to forecast at this stage. We expect to participate fully and work with a range of partners to develop projects for submission.

6.130. Atypical costs are those costs that are one-off and/or not foreseen for inclusion in a business plan. For this reason, we are not forecasting any in this Business Plan.

Driving business efficiency to keep bills low

6.131. WPD's ambition is to deliver a network which meets future energy requirements, as well as continuing to deliver industry-leading customer service at an efficient cost.

6.132. During RIIO-ED1, we have focused on delivering the work programmes specified in our business plan and outputs agreed with our stakeholders. In addition we have delivered many other outputs not foreseen before the start of RIIO-ED1 (such as establishing a DSO capability). We deliver on our proposals and respond to our stakeholders.

6.133. This is reflected in our RIIO-ED1 expenditure profile, where we have clearly delivered the investment programmes to which we were committed, as well as making service enhancements beyond our original RIIO-ED1 pledges. The costs of these service enhancements have been offset by efficiencies throughout the period.

6.134. Efficiency and value for customers is very important to us. We have been working to understand our current cost efficiency performance and will use our findings to inform and challenge our costs for RIIO-ED2.

6.135. We believe efficiency should consider both the cost of delivery and customer benefits. This reflects our commitment to provide value for money without compromising our high standards of customer service. This is supported by our stakeholders who have told us that efficiency is about much more than just the cost of delivery.

6.136. In RIIO-ED2, we are committed to delivering efficiencies on total expenditure. Some efficiencies have been embedded in this forecast while others will be wider forecast productivity improvements linked to trends in the wider economy (known as Ongoing Efficiency).

6.137. In the long term, customers will see benefit as a result of WPD's industry-leading work to advance DSO functionality and whole system thinking. The development of flexible solutions, working closely with transmission, customers and third parties, has begun to unlock a wealth of efficiency opportunities that will provide benefits for customers.

6.138. Our commitment to efficiency in our 'business as usual' activities means that bills will not increase by more than necessary. Wherever possible, we will continue to minimise and mitigate cost pressures, including those over which we have little direct control. In particular, we are expecting the costs of both direct and contracted labour and materials to increase above inflation (known as Real Price Effects or RPEs). While we will make every effort not to pass these price pressures onto our customers, we cannot ignore them.

6.139. We are currently assuming that the effect of cost increases as a result of RPEs will be offset by the productivity improvements (Ongoing Efficiency) we will implement in RIIO-ED2. We are continuing to develop our thinking and analysis on these factors and will review this position for future versions of the Business Plan.

Bill impact

6.140. We are proposing to spend more money per year than in RIIO-ED1 in order to deliver the commitments contained in this document, as well as to deliver against key government policy such as the transition to a net zero carbon future. Based on current financing assumptions, we are anticipating that despite this increased expenditure customer bills will remain broadly the same as they are today – at £96 per year for the average domestic customer.

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Chapter 7

Adapting to change

7. Adapting to change

Summary

5.1 WPD recognises that the UK is experiencing a period of significant change as it works towards a net zero carbon future.

5.2 As a key player in net zero, we need to react quickly to implement the appropriate solutions as electricity demand changes, in response to factors such as the expected increase in heat pumps and electric vehicles.

Track record

5.3 We have a proven track record of adapting to change and unforeseen challenges during RIIO-ED1. In that time, we reacted effectively to a series changing external demands. These included:

- Responding to high levels of distributed generation enquiries (especially for large solar farms) at the beginning of the price control period
- Developing Distribution System Operator (DSO) capabilities and becoming the first Distribution Network Operator (DNO) to publish a fully costed DSO plan
- Being the first to publish Distribution Future Energy Scenario (DFES) documents to forecast the regional distribution of Low Carbon Technologies (LCTs)
- Being the first to commit to a six monthly procurement cycle for flexibility services
- Implementing processes for the removal of transformers potentially contaminated with polychlorinated biphenyls (PCBs) to comply with revised environmental directives.

5.4 None of these challenges could have been predicted at the start of RIIO-ED1 and clearly demonstrate WPD's ability to adapt, react and, in many cases, be the first to deliver change.

RIIO-ED2

5.5 As we enter RIIO-ED2, we'll be operating in an even more dynamic energy sector, making our ability to respond quickly to challenges even more critical. This will be particularly relevant to the unpredictable growth of LCTs but also to other events such as changes to environmental legislation or post-COVID requirements.

5.6 To help achieve this, WPD has created a simple model to show how we will rapidly adapt to meet the changing needs of our stakeholders and the energy market.

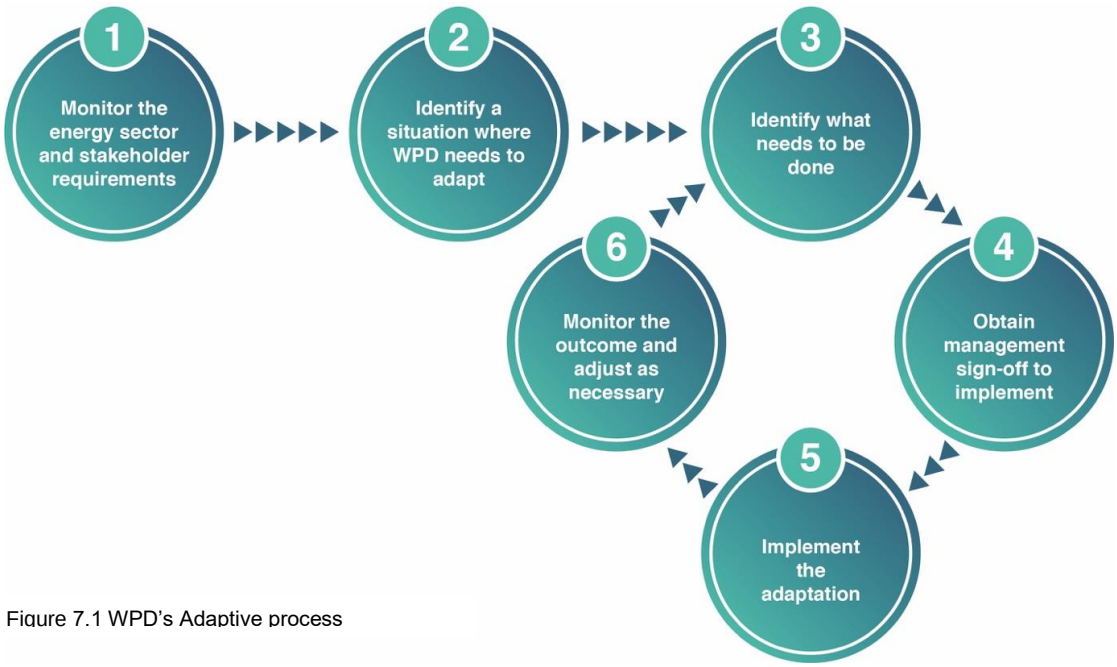

Figure 7.1 WPD's Adaptive process

1. Monitor the energy sector and stakeholder requirements.

   – We will ensure we are engaged with our stakeholders to understand the changes needed to meet their expectations. This will involve an extensive programme of generic and bespoke stakeholder engagement including annual engagement with local authorities, annual stakeholder workshops, bespoke sessions with connections customers and community energy groups, liaison with government, the regulator and industry groups. We will also need to monitor the outputs from experts across the industry to ensure we can identify emerging trends. WPD already engages extensively in all of these activities and will continue to do so throughout RIIO-ED2.

2. Identify a situation where WPD needs to adapt.

   – Staff must be empowered to identify changes which will lead to improvements at WPD. To do this, they must feel able to make a recommendation and see it through. We believe this culture already exists at WPD and that it is supported by our purpose and values.

3. Identify what needs to be done.

   – To develop the best solutions to meet the needs of a rapidly changing market, we must continue to recruit and retain the best and most experienced staff. These staff are crucial to enable WPD to adapt and respond effectively to the challenges ahead. This commitment to our staff will continue to be critical as we progress through RIIO-ED2.

4. Obtain management sign-off to implement.

   - At WPD, there are only two levels of management between the executive and junior management which means decisions can be made more quickly. All staff have the power to propose changes and solutions which can be actioned within departments, or escalated rapidly to senior level where there are wider implications for the business. The speed of this sign-off is key to our ability to respond quickly and appropriately to changing demands.

5. Implement the adaptation.

   - To maximise effectiveness, it is vital that adaptations are actioned as quickly as possible. The consequences of these changes (such as those made to data collection and reporting) should also be addressed at the same time. At WPD, we pride ourselves on adapting to, and delivering on, our stakeholders' expectations which is why we are confident we can continue to implement changes quickly and efficiently during RIIO-ED2.

6. Monitor the outcome and adjust as necessary

   - We will continue to engage extensively with stakeholders and to monitor the effectiveness of changes to ensure we've delivered the desired outcomes for our stakeholders. Where processes need to be revised, alternative solutions will be developed as quickly as possible to ensure we create maximum benefit at the earliest opportunity.

5.7 These key steps are already in place at WPD. As some parts of the process are informal, we are working to create a more recognised and transparent model that can be used for successful adaptations across WPD. We are confident that we have a culture and capacity that enables us to adapt quickly in response to emerging issues. As an 'enabler' we develop and implement solutions quickly and will continue to keep abreast of changing stakeholder requirements to make sure we uphold our reputation for adapting effectively and efficiently to change.

WESTERN POWER DISTRIBUTION

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Chapter 8

Glossary

8. Glossary

A

Accident Frequency Rate (AFR)
Accident frequency rate is derived from the number of annual accidents and the number of staff, and is expressed as 'accidents per 100 members of staff'. The calculation allows a like-for-like comparison irrespective of the number of staff employed.

Areas of Outstanding Natural Beauty (AONBs)
Includes national parks and areas that are designated as protected landscapes as defined in the National Parks and Access to the Countryside Act 1949

B

BEIS
The government's Department for Business, Energy and Industrial Strategy.

Broad Measure of Customer Satisfaction (BMCS)
An incentive scheme made up of a customer satisfaction survey, an assessment of how complaints are dealt with and a review of stakeholder engagement. It was introduced for DPCR5 and is designed to drive improvements in the quality of the overall customer experience by capturing and measuring customers' experiences of contact with their DNO across the range of services and activities the DNOs provide.

Building Research Establishment Environmental Assessment Method
A methodology used by the building industry to assess the environmental aspects of building construction and refurbishment.

Business Carbon Footprint (BCF)
BCF is a calculation which represents the effect our work has on the environment. BCF is measured and reported using equivalent tonnes of carbon dioxide to express the impact of energy usage in offices, emissions from vehicles and the release of greenhouse gases. BCF is used to encourage DNOs to consider the direct carbon impact of conducting their operations and to be proactive in the reduction of emissions.

C

Capital expenditure
Expenditure on investment in long-lived distribution assets, such as underground cables, overhead electricity lines and substations.

Centre for Sustainable Energy
An independent national charity that helps people and organisations from the public, private and voluntary sectors meet the twin challenges of rising energy costs and climate change.

Customer Engagement Group (CEG)
Ofgem required all utility companies to set up an independent Customer Engagement Group (CEG), to challenge and scrutinise the RIIO-ED2 Business Plans.

Competition in Connections (CIC)
Historically, the incumbent DNO would have provided new connections. Over recent price controls, Ofgem has promoted greater involvement of third parties in both the design of connections and on-site delivery of connections work. This means that third party connection providers compete for the business of providing new connections in a competitive market.

Customer Interruptions (CIs)
The number of customers whose supplies have been interrupted per 100 customers per year over all incidents, where an interruption of supply lasts for three minutes or longer, excluding re-interruptions to the supply of customers previously interrupted during the same incident.

Customer Minutes Lost (CMLs)
The average duration of interruptions to supply per year, where an interruption of supply to customer(s) lasts for three minutes or longer.

Customer Service Excellence (CSE) Standard
This is a Government scheme which recognises organisations that provide effective and excellent customer service. Similar assessments were previously awarded through the Charter Mark.

D

Demand Response/Demand Side Response (DSR)
A technique that can be employed to reduce load on the network when maximum demand is reaching or exceeding the capacity of the network. It relies upon commercial agreements being in place with customers who can reduce their load and have agreed to do so under the instruction of the DNO.

Digitalisation
Is the process of using digital technologies to make fundamental changes to the way the network is operated, There has been a gradual increase of digital technologies on the network – from automation to monitoring equipment.

Digitisation
Collecting information about the network using sensors and control equipment is known as digitisation, which also includes converting existing analogue information into digital formats.

Distributed Energy Resources (DER)
Smaller power sources embedded in the distribution network that can be used to provide the power to meet demand.

Distribution Future Energy Scenarios (DFES)
Forecasts the volumes and regional distribution of low carbon technology uptake in our region. This uses stakeholder-informed bottom up analysis to align with national industry-developed future energy scenarios.

Distributed Generation (DG)
Electricity generation connected to the distribution network. It includes wind turbines, domestic solar panels, large scale photo-voltaic farms, hydro-electric power and biomass generators. Sometimes referred to as embedded generation.

Distribution Network Operators (DNOs)
A DNO is a holder of an electricity distribution licence. There are 14 DNOs which are owned by six different ownership groups.

Distribution Price Control Review 5 (DPCR5)
The price control period which preceded RIIO-ED1. DPCR5 ran from 1 April 2010 until 31 March 2015.

Distribution System Operator (DSO)
It is anticipated that changes to the energy sector will require Distribution Network Operators to adapt the traditional, passive role of network management and incorporate additional functions with full operational responsibility for forecasting energy production and consumption along with balancing demand and generation on the distribution network.

Distribution Use of System (DUoS) charges
These are the charges levied to electricity suppliers for DNO costs that can be recovered from customers. The amount is determined through price control reviews.

E

Environmental Action Plan (EAP)
Environmental Action Plan sets out our ambitions to meet our stakeholders' net zero expectations, by reducing our environmental impact.

Embodied Carbon
This is the carbon footprint of a material or a product. It takes into account how much greenhouse gas (GHG) is released throughout the supply chain and is often measured over the entire life cycle of a product or service.

Energy Networks Association (ENA)
The industry body for UK transmission and distribution network operators for gas and electricity in the UK and Ireland.

Engagement
The process by which an organisation involves people who may be affected by the decisions it makes, or can influence the way in which actions are delivered.

ESQCR
Electricity, Safety, Quality and Continuity Regulations 2002. The ESQCR specify safety standards, which aim to protect the general public and customers from danger.

Extra High Voltage (EHV)
Voltages over 20kV up to, but not including, 132kV.

F

Flexible Services
Techniques used to provide more capacity in the network or reduce demand. These are provided by third parties through contractual arrangements. They can offset the need for reinforcement work.

Flexible Power
WPD was the first DNO to commit to a six monthly procurement cycle for flexibility services. Our customer-facing flexibility service, is known as 'Flexible Power', uses an electronic, automated dispatch platform.

Fuel poverty
Fuel poverty describes circumstances where customers struggle to afford electricity and to effectively heat their properties. Whilst WPD is not directly responsible for dealing with fuel poverty we refer customers to a network of expert partners for further advice and assistance.

G

Green Recovery
The government's plan to stimulate greener investment and cut emissions, following on from Coronavirus.

Guaranteed Standards of Performance (GSOPs)
Guaranteed Standards of Performance set minimum service levels to be met across a range of activities covering supply interruptions, appointments and connections. The Guaranteed Standards are specified in statutory legislation. Where a licence holder fails to provide the level of service required, it must make a payment to the customer affected subject to certain exemptions.

H

Health and Safety Executive (HSE)
A government organisation that has the responsibility of enforcing health and safety legislation.

Heat Pump
Systems which capture heat energy from the ground, bodies of water or air. They can be used for space heating, water heating, heat recovery and cooling in a range of buildings. A supply of electricity is required to power the heat pump system.

High Voltage (HV)
Voltages over 1kV and up to, but not including, 22kV.

I

Incentive on Connections Engagement (ICE)
An incentive mechanism which drives DNOs to improve communication and interaction with major customers. Penalties can be imposed where DNOs fail to demonstrate sufficient engagement with major customers.

Independent Distribution Network Operator (IDNO)

A company that can construct new electricity networks, embedded within and connected to the DNOs network, retaining ownership of and being responsible for the operation of the new network.

Independent Connections Provider (ICP)
A third party company that can construct new connections and the associated electricity network on behalf of a customer, with the network being adopted by either an IDNO or the DNO.

Inspections and Maintenance (I&M)
Activities carried out on a routine basis for the visual checking of the external condition of assets and the invasive examination of plant and equipment.

Interruption Incentive Scheme (IIS)
The Interruption Incentive Scheme is a mechanism that provides annual rewards or penalties based on each DNO's performance against their targets for the number of customers interrupted per 100 customers (CI) and the number of customer minutes lost per customer (CML).

L

LiDAR
Light Detection and Ranging (LiDAR) equipment used to survey our overhead lines for infringement by trees; this allows targeted tree cutting at the optimum time to prevent the trees' growth affecting our network.

Load
The amount of power flowing through an asset or a network. This may also be referred to as demand. Maximum demand is compared to capacity to determine if the network needs to be reinforced.

Low Carbon Networks Fund (LCNF)
A funding mechanism introduced under DPCR5 to encourage DNOs to prepare for the move to a low carbon economy. A fund was made available for DNOs and partners to innovate and trial new technologies, commercial arrangements and ways of operating networks. The LCNF structure was replaced by the Network Innovation Competition and Network Innovation Allowance during RIIO-ED1, however some LCNF projects will continue during RIIO-ED1.

Low Carbon Technology (LCT)
This is the collective term for devices that reduce the amount of carbon being used for heating, transport and generation. It includes electric vehicles, heat pumps and solar generation.

Low Voltage (LV)
This refers to voltages up to, but not including, 1kV.

LVSSA
Connections customers are categorised by Ofgem according to a range of factors. LVSSA customers are those seeking single domestic connections requiring no mains work at low voltage.

LVSSB
Connections customers are categorised by Ofgem according to a range of factors. LVSSB customers are those seeking two to four domestic connections or one-off commercial connections at low voltage requiring no network reinforcement work.

N

NARMs
Network Asset Risk Metrics (NARMs) are used to calculate the future risk associated with an asset over a number of years and to prioritise those assets which need to be changed.

Net zero
The UK's Climate Change Act (2008) sets out how the UK tackles climate change. The act says that by 2050 the UK Government must reduce greenhouse gas emissions by at least 100% compared with 1990 levels.

Network Innovation Allowance (NIA)
An allowance agreed as part of the price control to fund smaller scale innovation projects. The purpose of the allowance is to encourage DNOs

to innovate to address issues associated with the development of their networks. The NIA (and NIC) replaced the Low Carbon Networks Fund at the commencement of RIIO-ED1.

Network Innovation Competition (NIC)
An annual funding competition for larger and more complex innovation projects. The NIC (and NIA) replaced the Low Carbon Networks Fund at the commencement of RIIO-ED1.

O

Office of Gas and Electricity Markets (Ofgem)
Ofgem is responsible for regulating the gas and electricity markets and network monopolies in the UK to ensure customers' needs are protected.

Open Data
The presumption that all data can be shared unless proven otherwise for privacy, security or commercial confidentiality reasons.

Operational Technology (OT)
OT is technology that communicates and interfaces with business systems and physical assets and includes systems such as our communications system which allows us to interact remotely with sensors and monitors on the physical distribution network.

P

Polychlorinated biphenyls (PCBs)
PCBs are now known to be highly toxic industrial compounds and were found in the oil of some pre- 1989 transformers and a small range of other equipment.

Perfluorocarbon Tracer (PFT)
A chemical that is injected into fluid filled cables, used to speed up the location of leaks.

Price Control
WPD is a regional monopoly – our customers are such because of where they live and work. WPD is therefore regulated by Ofgem to make sure that we provide a high level of service for the money we are allowed to charge. The revenues that can be earned are set for a specific period of time referred to as a price control. The current price control period RIIO-ED1 runs from 1 April 2015 to 31 March 2023.

Priority Services Register (PSR)
A database that records details about customers in vulnerable circumstances so that additional support can be provided if needed.

Protection batteries
Most circuit breakers on the network rely upon batteries to provide the power to monitor the network and initiate tripping and reclosing actions. These batteries are separate to SCADA batteries that provide the power for communication systems between sites and central control centres.

Photovoltaic (PV)
Is the conversion of light into electricity using semiconducting materials that exhibit the photovoltaic effect, an example of this is a solar cell.

R

Real Price Effects (RPE)
Increase in prices of materials, direct staff or contract labour, over and above increases in inflation.

Reinforcement
The provision of more network capacity by installing more assets or installing higher rated assets

Resilience
The ability of the network to withstand extreme events such as storms and flooding, and having the ability to recover quickly from widespread power black outs.

Resilience Tree Cutting
This is the full removal or extensive cutting of trees that are found to be within the falling distance of overhead power lines. This ensures that they cannot cause damage to the power lines in the event of severe weather.

RIIO (Revenue = incentives + innovation + outputs)

The current regulatory framework, introduced for electricity distribution in 2015/16. It places emphasis on incentives to drive the innovation needed to deliver a sustainable energy network at value for money to existing and future consumers.

RIIO Electricity Distribution 1 (RIIO-ED1)

The eight year price control period that runs from 1 April 2015 to 31 March 2023. It is the first electricity distribution price control that uses the RIIO framework for setting allowances.

RIIO Electricity Distribution 2 (RIIO-ED2)

The electricity distribution price control period that runs from 1 April 2023 to 31 March 2028. Ofgem has determined that the RIIO-ED2 price control will be five years in length.

Routine Tree Cutting

Tree cutting is undertaken on a cyclical basis to provide sufficient clearance from equipment. Tree cutting prevents faults and keeps the public safe. Clearance is carried out to standard industry specified distances from equipment.

S

Smart Grid

A generic term for a range of measures that are used to operate electricity networks more flexibly, allowing more generation or demand (load) to be connected and managing the associated power flows.

Smart Meters

Smart meters record the energy consumed within a property and are capable of being read remotely. Smart meters have the capability to allow WPD much greater visibility of the operational state of the low voltage network.

Stakeholder Engagement and Consumer Vulnerability Strategy (SECV)

An incentive mechanism designed to encourage network companies to engage proactively with stakeholders and to deliver a consumer focused, socially responsible and sustainable energy service. Rewards are available to network companies who can demonstrate high quality activities against set criteria.

Substation

A part of the distribution network that transforms voltage and allows the re-routing of power by switching the configuration. It contains transformers, switchgear and equipment that protects the network components by interrupting supplies when there is a fault.

Sulphur Hexafluoride (SF_6)

A gas widely used as an insulating medium in transmission and distribution equipment. It has excellent insulating properties but is a potent greenhouse gas. It continues to be used because there are no alternatives available.

Supervisory Control and Data Acquisition (SCADA)

This is the term used for the system that monitors and controls distributed assets. It comprises the remote terminal units, communication infrastructure and human interface within central control rooms.

Switches / Switchgear

Devices on the network can be turned on or off and are used to alter the routing of electricity. Some can be operated remotely by central control engineers. Others need to be operated manually on site by authorised staff.

T

Technical Network Losses

These are losses associated with power flowing through the network.

Time to Connect Incentive (TTC and TTQ)

An incentive scheme which focusses on two elements – the time taken to provide a quotation for a connection and once the offer is accepted the time taken to complete the necessary connection works. Rewards are available to DNOs who outperform common targets set by Ofgem. Time to Connect and Time to Quote targets are expressed in days.

Third Party Connection Providers
Independent organisations that carry out elements of connections work that are contestable. Work which is non-contestable will always be undertaken by the DNO.

Totex
The licensee's total expenditure (with limited exceptions) on regulated business activities. It includes both capital and operating expenditure items that the licensee has control over.

Transformer
Converts electricity from one voltage to another.

V

Vulnerable Customers
Vulnerable customers include those customers who are medically dependent upon electricity, have special communication requirements, have other special needs with a dependence upon electricity (e.g. stair lift), are elderly, have a transient vulnerability to a power cut or need assistance with energy affordability.

W

Western Power Distribution (WPD)
The electricity distribution network operator that holds four distribution licences for West Midlands, East Midlands, South Wales and South West.

Worst Served Customers
Customers who experience 12 or more higher voltage interruptions over a three year period, with a minimum of three in any one year.

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