WPD INNOVATION
Transforming the electricity network

RIIO-ED2 Innovation Strategy
2021

WESTERN POWER DISTRIBUTION
Serving the Midlands, South West and Wales

Contents

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Transforming the electricity network

Introduction

This document sets out our Innovation Strategy for the RIIO-ED2 price control period, which starts in April 2023 and ends in March 2028.

Our innovation ambition is to drive the transformation of the industry and enable the UK to meet Net Zero affordably. It is our innovation ambition that shapes our innovation strategy and defines our values and priorities. Our innovation work will provide us with the tools needed to meet our ambition and drive change in the industry.

During RIIO-ED1, our innovation programme transformed our network and enabled us, among others, 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.

As we expect some of the current smart solutions to reach their saturation point within 5 years, we cannot stop innovating. We need to build on the great technological and commercial solutions that we previously developed in innovation and now use in BAU, to extract as much value as possible from our network. Therefore, 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 needed for a sustainable and intelligent network, as well as demonstrating new ways to support our vulnerable customers through the energy transition. We are excited to continue delivering innovation through Ofgem funded schemes in RIIO-ED2, such as the Network Innovation Allowance (NIA) and the Strategic Innovation Fund (SIF).

We see the RIIO-ED2 period as the opportunity for us to make the changes we need in our business in order to be able to drive innovation within our organisation and in the industry, to meet our innovation ambition.

We will do that by running our new Business Innovation Programme alongside our Ofgem funded Innovation Programme.

Our innovation work in previous price control periods enabled us to build a strong framework for creating and delivering innovation projects and provided us with the skills and knowledge needed to be able to successfully run complex innovation projects.

We will use these to deliver our Business Innovation Programme which will be entirely funded by us and focus on lower risk projects that can introduce cost efficiencies and pay for themselves over time. We will also roll-out solutions proven successful in previous NIA, Low Carbon Networks Fund (LCNF) and Innovation Funding Incentive (IFI) which are now needed to support net zero projects through our Business Innovation Programme. We have already updated our existing framework, captured in our Project Governance Guidelines, to make it applicable to Business innovation projects and are currently testing it through the delivery of our PrimeEV main business project. This way, we will ensure that by the start of RIIO-ED2 our Business innovation framework will be finalised and ready for use to deliver our Business Innovation Programme.

We believe that driving innovation within our organisation is not just about delivering innovation projects. It is about making our staff passionate for innovation, encouraging and rewarding positive change and ultimately embedding a culture that celebrates innovation. This is a big part of our strategic focus for the RIIO-ED2 period and we aim to achieve it by introducing performance metrics on innovation in the main business to reward teams that have adopted innovative solutions and worked with other teams in the business to drive changes.

Additionally, the ownership of Business innovation projects will be shared projects between the innovation team and main business managers.

Throughout RIIO-ED2, we will be assessing our culture to ensure we achieve the changes we want to see and also continuously monitor the benefits achieved through Business innovation.

By outlining our innovation ambition, values, and strategic focus in this document we strive to inspire new, exciting ideas for innovation that can help us transform the industry to achieve Net Zero.

Who We Are

We are the Distribution Network Operator (DNO) of the East Midlands, West Midlands, South West and South Wales.

We are the Distribution Network Operator (DNO) of the East Midlands, West Midlands, South West and South Wales. As the DNO covering these four licence areas, we are responsible for keeping the lights on, maintaining the equipment in our distribution network, fixing any faults and connecting customers to the network.

Keep the lights on by operating our network assets effectively

**Maintain equipment so** that the network is in a condition to remain reliable

Fix the network if equipment gets damaged or is faulty

Connect customers by upgrading existing networks or building new ones

The area served by us is shown in the map below.

WPD Distribution Area

Through our innovation work, we are adapting to the rapid changes in our network by developing novel ways of operating our assets, trialling smart technologies and finding new ways of enabling all our customers to participate in the energy transition.
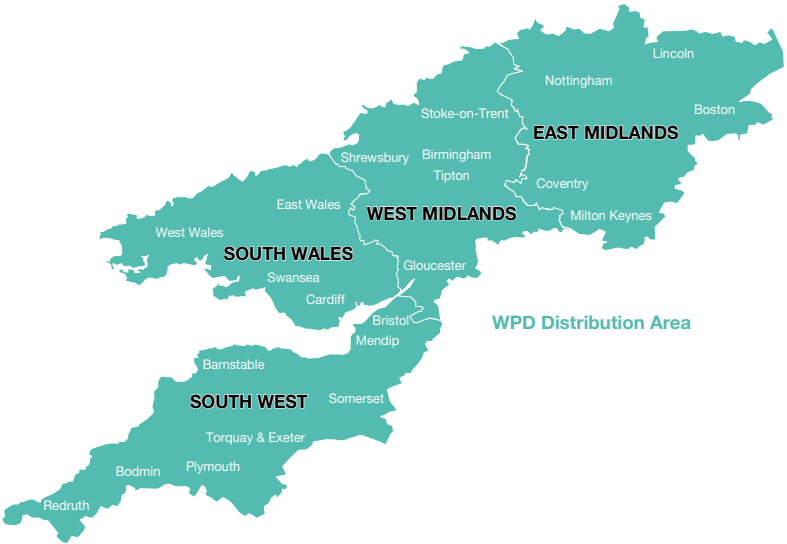
We deliver electricity to **7.9 million customers (27% of the UK population) over an area of 55,000km².** This electricity is distributed over **220,000km of overhead lines and underground cables**, fed from **185,000 substations**. Our network changes rapidly and now has an increasing number of low carbon technologies connected to it, including renewable generation.

As the DNO of the East Midlands, West Midlands, South West and South Wales, we are responsible for operating and maintaining the electricity distribution network in these areas.

Through our innovation work, we are adapting to the rapid industry changes by developing novel ways of operating our assets, trialling smart technologies and finding new ways of enabling all our customers to participate in the energy transition.

Who We Are

WPD INNOVATION
Transforming the electricity network

We are the Distribution Network Operator (DNO) of the East Midlands, West Midlands, South West and South Wales.

| Large power stations | Transmission | Western Power Distribution | Supply |

Centrally generated power

Transmitted around the country at 275kV or 400kV

Grid Supply Point

Large substation 132kV

Primary substation 33kV

Distribution substation 11kV

Electricity meter

7.9 million customers (domestic & businesses 230V)

Low carbon generation and storage
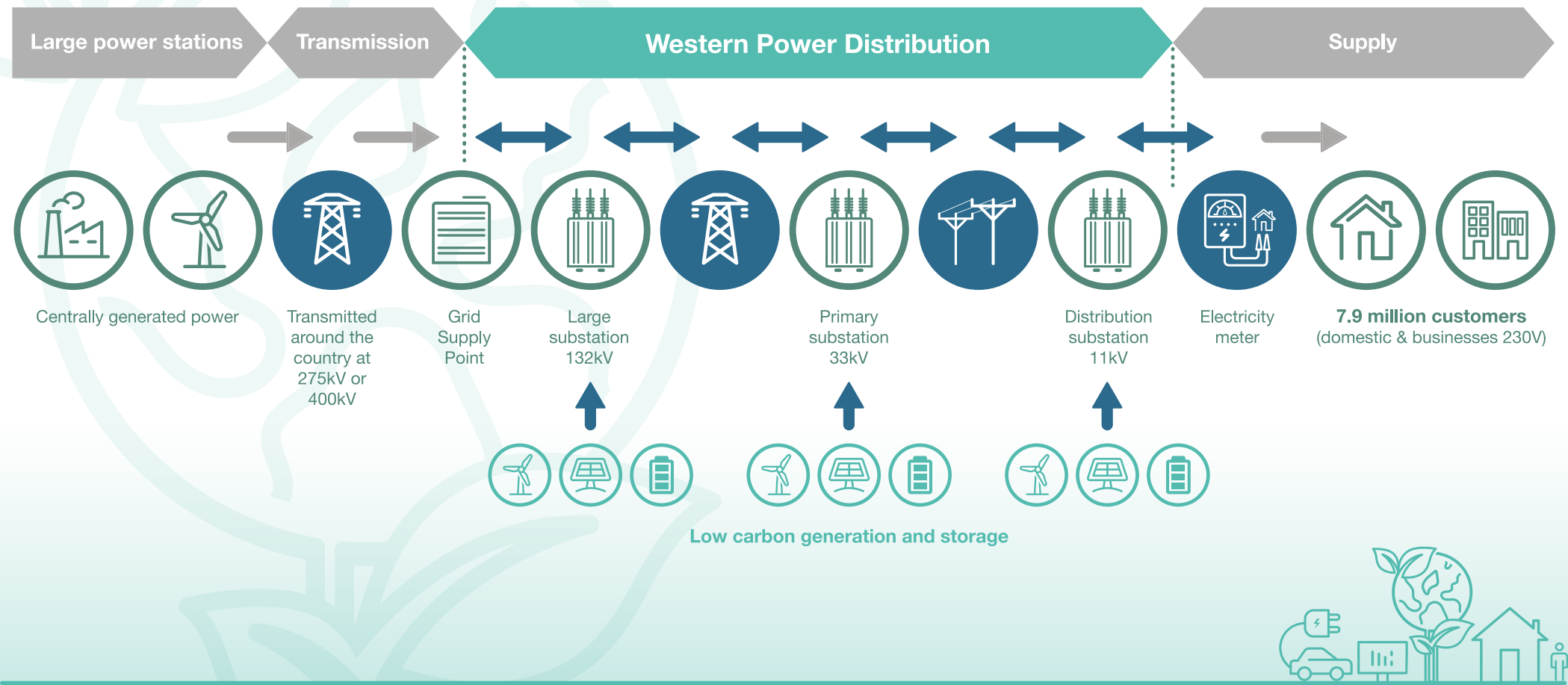
Our Innovation Ambition

"Our innovation work will provide us with the tools we need to drive the transformation of the industry and enable the UK to meet Net Zero affordably"

This is our ambition. Through our innovation work we will develop the processes, systems, technologies and skills necessary to change our network and the way we operate as a business in order to facilitate Net Zero while at the same time keeping costs affordable for customers. We will not focus only on changing our own network and business but the industry as a whole. We recognise that as a DNO we have a big role to play in the energy transition and as our customers have asked us to do, we will aim to drive the transformation of the sector by leading the way with innovation.

We will lobby for policy or regulation changes that can provide customer benefit, we will provide additional support to other networks to help them apply our successful innovation solutions in their activities and expand our knowledge and contacts to other industries which depend on our infrastructure. Action and change is necessary in many industries in order to meet the Net Zero targets, with a lot of complicated relationships and interdependencies across them.

We will work with industries we have not worked with before to understand their challenges, their strategies and how we can overcome barriers in regulation, funding and governance to be able to collaborate and together develop whole system solutions that provide the best value for money to UK consumers. We have already started creating relationships with other industries during RIIO-ED1.

For example, we've been working with water utilities and railway network operators to understand how they innovate and create our first joint innovation projects ahead of RIIO-ED2. We believe that establishing contacts and relationships early is key to be able to create larger scale whole system solutions in RIIO-ED2.

Our ambition to drive the transformation of the industry to enable the UK meet Net Zero affordably underpins our innovation strategy, shapes our priorities and defines our values.

Our Innovation Ambition is to drive the transformation of the industry to enable the UK meet Net Zero affordably.

This ambition underpins our innovation strategy, shapes our priorities and defines our values.

As our stakeholders have asked to do, we will lobby for policy or regulation changes that can provide benefits to UK consumers.

We are excited to lead work with other industries that depend on our infrastructure to develop the whole system innovation solutions needed to achieve Net Zero.

Our Values

To achieve our innovation ambition we believe it is important to have clear values that align with our ambition.

It is our values that determine how we deliver our strategy and our projects, how we interact with others, how we work as a team and how we manage our work. By evolving everything that we do around our 3 main values we ensure that we have the right strategic direction and we stay on track to meet our ambition.

These values are Decarbonisation, Excellence and Value for Money.

Decarbonisation

Excellence

Value for Money

Everything we do and how we do things evolves around our 3 key values of Decarbonisation, Excellence and Value for Money. These values are shaped by our Innovation Ambition.

We are passionate about driving the decarbonisation of our industry.

We strive to be achieving excellence in everything we do.

We are committed to providing maximum value for money to our customers in each and every project we deliver.

Decarbonisation as one of our values captures our aim to be a main contributor to the low carbon transition and lead the transformation that is needed in the industry to achieve that.

We define excellence as one of our values as we endeavour to be achieving excellence in all of our innovation projects in order to be producing successful solutions that can be applied in our main business, by other networks and even transferred to other industries. It is only by being excellent that we can lead the industry transformation.

Finally, we believe that we have a social responsibility to ensure that the Net Zero transition is affordable for customers and for this reason providing value for money to our customers is another one of our values.

Our Track Record

We are proud to have delivered a large portfolio of innovation projects since the Innovation Funding Incentive (IFI) was launched by Ofgem in 2005.

The IFI provided an opportunity to improve the quality of research and development within the UK electricity industry. Low Carbon Networks Fund (LCNF), launched in 2010, was designed to support the development of low carbon technologies and facilitate the changes brought about by the Carbon Plan. It consisted of large scale projects funded through the competitive process (Tier 2) and smaller scale projects that were self-contained (Tier 1). In RIIO-ED1 the Network Innovation Allowance (NIA) and Network Innovation Competition (NIC) replaced the previous LCNF schemes.

We have worked with over 50 different organisations to deliver our innovation work.

What Innovation Work did we produce in RIIO-ED1?

Our innovation work has enabled us to address key challenges our customers asked us to address by developing and trialling solutions in our innovation projects. The successful solutions were then transferred into company policy and main business activities and made available to all of our customers.

One of the biggest issues that customers were facing was the fact that in areas where there was limited network capacity, they could not connect to the network (ANM) quickly or cost effectively. We explored new ways of allowing our customers to connect to our network through our Lincolnshire Low Carbon Hub project which developed a new connection type called Active Network Management (ANM) where the customer gets curtailed in certain network conditions. This is now part of our Flexible Connections policy suite. Flexible Connections are available to all customers seeking a connection where significant reinforcement is required.

ANM is now business as usual and we have a framework agreement in place with three vendors, with multiple zones currently active and a plan in place for all of our remaining network to be active by the end of 2021. Additionally, through our FlexDgrid project we have developed policies to enable soft intertrip schemes based on fault levels, allowing customers to connect in areas where they previously couldn't due to fault level issues.

Export limitation devices have been developed by manufacturers to locally balance generation and demand. However, due to the lack of an industry standard, the variance in the quality and method of operation of these devices is wide. We developed a policy for acceptance of these schemes which outlines the minimum requirements to achieve compliance with the new WPD policy.

This policy was circulated to the other DNOs and following further refinement was developed in conjunction with manufacturers to form a new UK standard - ENA Engineering Recommendation G100.

We are proud to have driven the creation of this new standard, enabling the use of export limitation devices in the UK.

Our innovation programme has enabled us to collaborate with over 50 different organisations to transform our network.

We developed new connection options for our customers such as ANM, which enable customers to connect to areas of our network where it would previously be challenging to connect due to high costs.

We led the creation of new UK standards such as Engineering Recommendation G100, driving the use of export limitation devices in UK electricity distribution networks.

We developed new policies and solutions that enable customers to connect in areas where fault level issues would have previously prevented a connection.

Our Track Record

Through our technological projects, we aimed to develop new systems and operational practices that would allow us to increase the available network capacity without physically expanding our network. As part of the Network Equilibrium project for example, we have developed and successfully trialled our System Voltage Optimisation (SVO) technology which has revolutionised the way we operate our network in real-time and proved the significant network capacity benefits it can offer.

The roll-out of SVO, planned for completion within the RIIO-ED2 period, will enable us to make the most out of our existing network. As part of this project we also implemented the first AC-DC-AC link in the 33kV network in the UK, using a power electronics device which enabled us to interconnect two 33kV networks we couldn't connect together before. This allowed us to control the power flows and balance generation and demand across two different areas.

The ENTIRE project explored the technical and commercial requirements to utilise flexibility as a service to avoid asset investment requirements. Through trialling over 47MWh of flexibility and generating policies and procedures, this enabled the Flexible Power brand to be developed and is now offering business as usual flexibility solutions to the whole business.

We often received requests from customers who wanted to know what the generation mix in their area was and therefore how impactful that is to the environment. Therefore, through our Carbon Portal and Carbon Tracing projects we created a website and app that customers can use to find out information about the energy mix and carbon intensity in their local area.

Through our extensive community engagement work, we identified that local stakeholders, academics, community groups and various organisations are interested in having access to local network data. In our OpenLV project we developed and trialled a solution that provides access to local substation data which is now going to be rolled-out.

In our data analysis projects, we created tools that enable us to analyse our time series data that we receive from our network, in order to identify monitoring points that are incorrect and the need for further monitoring devices in the network. These have been used by our planning teams since the innovation projects ended.

Building on our monitoring work, through our innovation projects we have developed policies that allow us to install monitoring devices on the LV network without the need for a substation outage. We have also run a large trial of power quality monitoring in our network which provided learning on how power quality transducers behave in real network operation and developed an automated tool for harmonics analysis using the retrieved data from the field devices.

We have explored how reducing the voltage in our 11kV networks can reduce network demand and after our innovation project concluded we have run a programme of work to lower the voltages in our 11kV networks by 100V in all licence areas.

We developed network optimisation technologies that enable us to maximise the available capacity in the existing network.

We responded to stakeholder feedback asking for more visibility on the carbon intensity of the energy mix in their local area by developing an app.

We have completely changed our approach to network monitoring and successfully designed and trialled solutions that provide us with visibility of network operation at both LV and HV.

Our Track Record

We have run a large number of projects on Electric Vehicles (EVs) which enabled us to understand the impact they could have on our network and how customers prefer to use their EVs; we developed LV planning tools that help us model EVs in our network and assess how they affect its operation, we designed new technological solutions to enable Motorway Service Areas to have additional capacity for EV charge points more cost effectively than traditional solutions and trialled Vehicle to Grid (V2G) to examine how these services can impact our LV infrastructure.

Building on our work on flexibility, we have investigated how existing customers can help us manage our network by providing reactive power using their existing assets.

After proving the significant network benefits this can provide, we are aiming to continue our work on this and create the reactive power markets we need in a large scale NIC project starting in March 2022.

We have also done significant work on domestic flexibility in our flexibility focused NIA projects which led us to the creation of our Equinox project, which if successful in the 2021 NIC competition, will run the largest heat flexibility trial in the UK and enable us to create the commercial arrangements needed to overcome existing barriers to domestic heat flexibility but also accelerate the adoption of other Low Carbon Technologies (LCTs) that could participate in domestic flexibility services.

Our innovation work so far has also developed policies in other areas such as dynamic line ratings, new planning processes increasing our engagement with local authorities and gas networks, tools that enable us to assess our network performance such as losses and new techniques such as LiDAR that increased efficiency in our network inspection practices.

What about unsuccessful projects?

Not all of our projects have produced solutions that were suitable for roll-out within the business for a number of reasons. For example, some projects were ahead of their time and need to be revisited again in the short term future to re-evaluate their business case as technologies are more widely adopted. We have in fact already identified 6 such projects and we plan to re-assess them ahead of the commencement of the RIIO-ED2 period. Some other projects have proved that the solutions they investigated or designed should not be implemented as they would not provide any customer benefit.

An example is our Superconducting Cables NIA project which showed that using superconducting cables in the UK distribution system is too expensive, preventing investment that would not provide value for money. Other projects demonstrated that the technologies they examined were not feasible. Our SF_6 alternatives project for example concluded that a trial of mediums that could replace SF_6 was not feasible. In some occasions we chose to terminate projects early (our DEDUCE project for example) due to the lack of positive results, ensuring that we don't spend innovation funding on work that will not provide value for money.

Both our successful and unsuccessful projects have helped us build and continuously improve our robust framework for delivering innovation, develop the skills needed to plan complex projects and manage relationships with projects partners. These skills and the experience we gained is our greatest asset, making all our work incredibly valuable even if the outputs were not what we expected.

We recognise that not all projects will be successful or produce solutions that are suitable for roll-out but we are proud of our passion for continuous improvement and of our focus on extracting maximum learning out of every single project that we do and providing the best value for money we can.

We are making our network ready for EVs through our EV projects that have already provided us with learning on charging behaviour, network impact and new solutions for providing capacity for chargepoints at Motorway Service Areas.

We developed flexibility services which give our customers the opportunity to help us manage our network in return for a payment, saving significant reinforcement costs. We will be building on this work to drive the creation of reactive power services for DNOs.

Not all projects have been or will be successful. We are proud of our passion for continuous improvement which enabled us to learn from failure and build a robust framework for delivering innovation.

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What does this mean for customers?

Faster and cheaper network connections

Issued 3102MW of ANM connection offers

Customers and community groups can access network data

Community Groups able to access over 1m data points every day

Customers can earn money by providing flexibility services

440MW of flexibility under contract across 256 primary substations

Reduced customer bills

£14M in reduced customer energy costs per year across WPD area

More connection options for all UK customers

267MW of generation connected through alternative connection options

Customers can find out the energy mix and carbon intensity of their local area

Carbon Portal and Carbon Tracer App available to all of our customers

Customers can connect their LCTs more cost effectively

500MW of LV capacity released through updated PV modelling assumptions

Customers and communities have increased awareness of industry changes

More than 1500 stakeholders engaged with us in our community energy focused

The Need for Innovation in RIIO-ED2

We recognise how important our role is, as a Distribution Network Operator, in achieving Net Zero.

We need to ensure that our network will be able to facilitate the connection of even more Low Carbon Technologies (LCTs) such as renewable generation and energy storage and we expect a large number of electric vehicles and heat pumps to connect to our network over RIIO-ED2. These connections and the expected increase in demand needs to be supported by the network in the most cost efficient way possible in order to keep electricity affordable for everyone.

Smart technology and commercial solutions that were developed in previous price control periods have enabled us to connect more customers to the network, quicker than before. However, we expect that some existing smart solutions will reach their saturation level in the next 5 years, requiring traditional network reinforcement in order to provide the network capacity that will be required. This highlights the need for further innovation that will enable us to make the most of our existing network and defer network reinforcement for longer.

We also need to keep up with the needs of our customers and understand how they will continue to change in the future. This will require adapting the way that we interact with customers, the support we provide and the way our smart solutions can be accessed. It is our responsibility to ensure that everyone will be able to benefit from the new opportunities and markets that have been created and will continue to evolve, so that the energy transition takes place in a fair way that protects the fuel poor and the most vulnerable.

For these reasons, we cannot stop innovating. We need to build on the great technological and commercial solutions that we previously developed in innovation and now use in BAU, to extract as much value as possible from our network. We need to continue finding new ways to design, operate and develop our network in order to continue maximising the capacity of our existing assets.

Our smart solutions and flexibility services need to be easily understandable and accessible by all of our customers with whom we need to find new ways to engage. All of these activities require dedicated resource, funding and the right framework and culture that encourages innovation.

We expect to see the number of EVs and heat pumps connected to our network increase significantly during RIIO-ED2.

The expected increase in demand needs to be supported by the network in the most cost efficient way possible in order to keep electricity affordable for everyone.

Smart technologies and commercial solutions developed in previous price control periods have enabled us to connect more customers to the network, quicker than before but we expect some smart solutions to reach their saturation level in the next 5 years.

For these reasons, we cannot stop innovating.

Our Strategic Innovation Plans for RIIO-ED2 and Beyond

Our strategic innovation plans are formulated around our innovation ambition to drive the transformation of the industry to enable the UK meet Net Zero.

We have built extensive knowledge and skills in delivering challenging innovation projects since the IFI was introduced up to now. We developed a strong framework for creating and delivering our projects which is based on internationally recognised project management methodologies (PRINCE2) and applied that in the 140 projects we have completed so far. We have documented this framework within our Project Governance Guidelines, ensuring that our innovation team consistently follow our project management approaches in all projects.

Our experience in delivering innovation projects has equipped us with the tools we need to be able to successfully plan and deliver any type of innovation, from small research projects to large scale multi-million pound demonstration trials involving a number of organisations. We are therefore confident that we have everything we need to be able to continue delivering innovation projects in the RIIO-ED2 period and beyond and we will not be making any radical changes in our approach to delivering projects. We will, however, continue improving our already robust framework whenever any area of improvement is identified.

We are excited to continue delivering NIA projects, we are looking forward to starting our first SIF projects and we will continue working on projects funded through other non-Ofgem driven mechanisms.

Our focus in the RIIO-ED2 period will be on using the skills, knowledge and experience we have built in previous price control periods to lead innovation within the business, deliver projects that can reduce costs, roll-out successfully proven innovation and establish a business culture that celebrates innovation and embraces change.

Our Innovation Ambition to drive the transformation of the industry to enable the UK meet Net Zero, shapes our strategic innovation plans for the future.

Our experience in delivering innovation projects has equipped us with the tools we need to successfully plan and deliver any type of innovation.

In RIIO-ED2, we will focus on using our experience and skills to lead innovation within our organisation to deliver projects that can introduce cost efficiencies, roll-out previously proven innovation and embed a culture that embraces innovation.

Our new Business Innovation Programme

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We see the RIIO-ED2 period as the opportunity for us to make the changes we need in our business in order to be able to drive innovation within our organisation and in the industry, to meet our innovation ambition. We will do that by running a Business Innovation Programme alongside our Ofgem funded Innovation Programme.

We define Business Innovation, or otherwise referred to as BAU Innovation, as lower risk innovation that cannot be funded through the Ofgem driven mechanisms (NIA and SIF) but can provide benefits to our network and our customers by reducing our costs and introducing efficiencies. Additionally, the roll-out of innovation that will be proven in the RIIO-ED2 period by us or other DNOs will also be delivered as part of our Business Innovation Programme during the RIIO-ED2 period in order to accelerate the adoption of successful innovation within the business.

We have already started preparing for this by updating our existing framework, documented in our Project Governance Guidelines, to capture how it applies on the delivery of Business Innovation Projects. We have even started applying it in the delivery of our first Business Innovation Project, called PrimeEV which is now in the delivery stage. Delivering this project now enables us to test our updated framework and identify any further changes required before applying it on our Business Innovation Programme in RIIO-ED2.

> **By the start of RIIO-ED2 we will be ready to immediately start delivering our Business Innovation Programme.**

Our Business Innovation Programme will be delivered by additional resource within our innovation team which will be dedicated to this work.
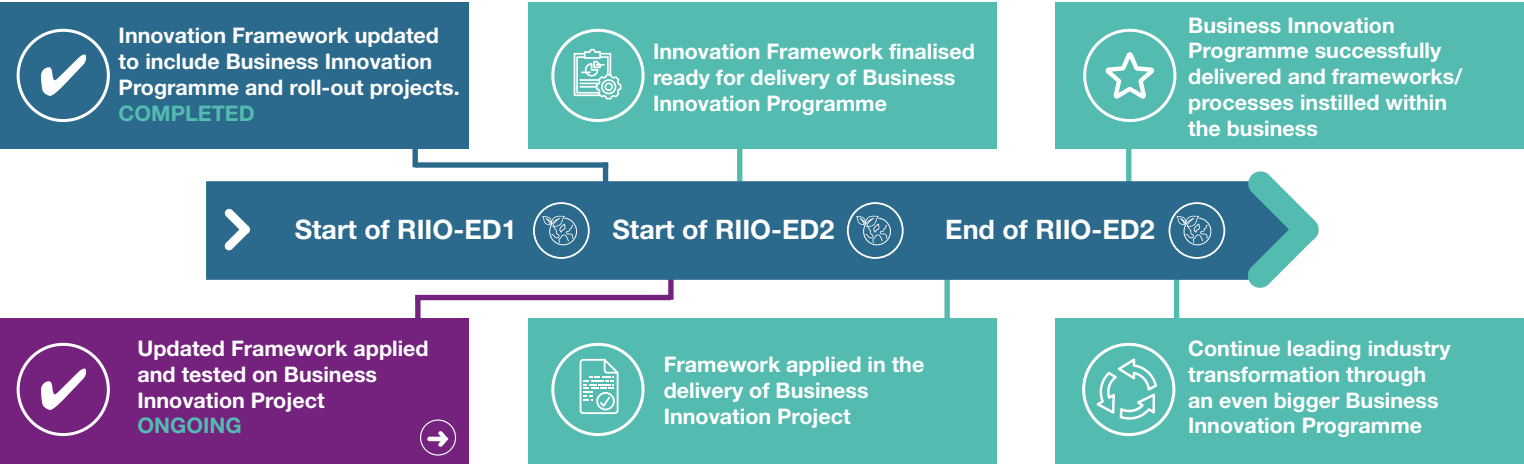
In RIIO-ED2 we will dramatically increase our innovation activities.

We will be delivering two innovation programmes instead of one and expanding our innovation team at least by 50%.

Our new Business Innovation Programme will consist of the rollout of previously proven innovation and projects that can enable our business to operate more cost efficiently.

Our core Innovation Programme will still deliver projects funded through external mechanisms such as NIA and SIF.

Business Innovation

Innovation Framework updated to include Business Innovation Programme and roll-out projects. **COMPLETED**

Innovation Framework finalised ready for delivery of Business Innovation Programme

Business Innovation Programme successfully delivered and frameworks/ processes instilled within the business

Start of RIIO-ED1   Start of RIIO-ED2   End of RIIO-ED2

Updated Framework applied and tested on Business Innovation Project **ONGOING**

Framework applied in the delivery of Business Innovation Project

Continue leading industry transformation through an even bigger Business Innovation Programme

Embedding a Culture that Celebrates and Rewards Business Innovation

We recognise that driving change within our organisation is not just about delivering projects. It is about changing perceptions so that innovation is not seen as scary, complicated or difficult. It is about rewarding innovation, encouraging continuous improvement and embracing change. It is about embedding a culture that celebrates innovation.

That is exactly what we want to achieve within our business. In RIIO-ED2 we will see our main business teams driving innovation.

We aim to do that by creating internal innovation performance metrics which will be used to asses on a monthly basis the innovation performance of each business department including all distribution areas, control systems, network design, finance and other teams. These innovation performance metrics will formalise the need for our BAU teams to be driving the changes needed to make their processes more efficient and provide the reporting mechanisms necessary to be tracking progress.

We aim to create a competitive spirit between our internal teams that encourages the efficient delivery and adoption of innovation. At the same time we will reward teams that collaborate with each other in order to successfully implement their innovation activities. Even though the delivery of Business Innovation Projects will be managed by the innovation team, each Business Innovation Project will also be jointly owned with the senior Manager responsible for the business area the project is delivered in, strengthening the link between innovation and main business.

Each business team will also have a dedicated innovation ambassador who will be responsible for driving innovation within their team and encouraging the creation of new ideas.

Our culture will also be shaped by the new people that join our business to become our future leaders. Attracting the best talent and giving opportunities to ambitious individuals that are passionate about making a change in the industry will be key to achieving and maintaining the culture we want to have. We have already started acting on this through our most recent Graduate Recruitment where we changed our process to focus on getting the right people into the business who would be able to drive innovation and change. Additional to this, all our business graduates will be spending time with our Innovation team as part of their graduate scheme where they will be given opportunities to make a change and appreciate the benefits innovation can bring.

We also recognise that culture change cannot happen quickly. We expect to see business engagement to grow within the RIIO-ED2 period and our aim is to have new Business Innovation ideas submitted to the innovation team every month by the end of RIIO-ED2. We will keep monitoring our business engagement and we will be continuously assessing our innovation culture during RIIO-ED2 by taking into account the number of projects in delivery, the benefits provided through implemented Business Innovation and our staff's perception of innovation captured in surveys.

Our work will not be just about delivering projects. We are taking on the task of changing our business culture, so that innovation is celebrated and rewarded within the business.

In RIIO-ED2, we will see our main business teams driving innovation.

Internal performance metrics will be assessing the innovation performance of each department on a monthly basis.

Ownership of main Business Innovation projects will be shared between the innovation team and the business owner, strengthening the link between innovation and main business.

Embedding a Culture that Celebrates and Rewards Business Innovation

Understanding the barriers

The nature of our business means that the focus of the majority of our main business teams has been constant over the years with no to very little change in their traditional activities of keeping the lights on.

Although we did have some great engagement with our main business teams when delivering our innovation projects so far, not all of our teams in all of our areas have had the chance to be involved in our previous innovation projects.

This is because innovation trials usually took place in in a specific area. This means that change and innovation are not familiar concepts for most of our staff. To explore this further, we have in fact engaged with our business owners to discuss with them what innovation means to them and any innovation activities they completed within their teams already or are planning to complete in RIIO-ED2. This exercise verified that perceptions of innovation vary within the business and there isn't as much awareness as there should be on how innovation has already improved a lot of our activities of operating the network, connecting customers and increasing existing capacity.

Through this, we also discovered some great novel initiatives that local teams were undertaking that we had no awareness of, such as trialling new technologies that can accelerate the restoration of supplies in fault conditions. Therefore, we think that to be able to embed a culture that embraces innovation, we need to start with the basics and first of all help our staff understand what innovation is and how it has already improved our activities.

We will do that by running internal campaigns to spread the positive message and also visit our local teams to speak to them in person about innovation and how their ideas can be implemented through our Business Innovation Programme. We will focus on spreading the message to our staff that their suggestions will always be listened to and that we can help implement them.

As part of the process we followed to create our plans for changing our culture, we started first by trying to identify the barriers that would prevent this.

Innovation can often be perceived as difficult or something that is only delivered by innovation experts.

We will run internal communication campaigns to spread the positive message about innovation and the improvements it can make in our Business.

We will focus on ensuring that our staff feel empowered to submit their innovation ideas and that they know that they will always be listened to.

Generating and Assessing Ideas

A lot of our innovation projects are generated from within our business by addressing specific challenges that our business experts identify. However, to complement and boost our own innovative thinking, we work with third parties on forward-thinking projects. To encourage more inventive thinking we issue 'calls for ideas' for future innovation projects.

These calls are run at different times of the year and invite individuals or organisations to submit proposals for specific topics. As they have been very successful, we will continue these calls for ideas in the RIIO-ED2 period.

During RIIO-ED2, we will develop a new interactive ideas portal aimed at staff, third parties, communities and other stakeholders to encourage these groups to make suggestions for new projects and make the process as easy as possible for them. 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.

We will continue to continuously actively explore external involvement in the generation of ideas for new projects through a variety of mechanisms:

☆ Identifying learning and best practice development from other DNOs' projects that can be either integrated in to our business as usual practices or developed further through innovation trials.

☆ Interacting with wider stakeholder groups such as community energy groups and EV Chargepointoperators' forums to understand their needs and challenges to shape our project programme.

☆ Investigating activities and innovations being developed outside of our direct industry to understand what can be learnt and adopted to improve our wider business operation.

These activities will be used to generate ideas for both Ofgem funded and Business Innovation projects.

We also want to discover new ways of generating ideas, therefore we will remain open minded on our approaches and will continuously review them. We have already started conversations with leading technology companies which have a track record of leading innovation in their sectors as we are keen to learn from their approaches.

Project ideas will be assessed based on their risk level, the business case, their alignment with our innovation strategy and for Ofgem funded projects their compliance with the NIA and SIF governance.

Our business experts identify challenges which generate new ideas for innovation projects but we also work with third parties on forward-thinking projects to complement and boost out thinking.

In RIIO-ED2 we will develop a new interactive ideas portal to make it easier for both our staff and third parties to submit ideas for projects we can add to our Core and Business Innovation Programmes.

Project ideas will be assessed based on their risk, level, alignment with governance and strategy and their business case.

Delivering our Business Innovation Programme

WPD INNOVATION
Transforming the electricity network

We have a robust framework, captured in our internal Project Governance, for delivering innovation projects and we have detailed plans for getting this framework ready for use to deliver our Business Innovation Programme in RIIO-ED2. However, delivering innovation within our main business is not just about process, it is also about removing any barriers that would limit the adoption of innovation.

From our previous experience in delivering innovation projects, we have found that sometimes staff are not comfortable with change and do not see innovation as beneficial or exciting. We are therefore focusing on changing our culture and will be running campaigns to make all our business areas aware of the positive changes brought by innovation and change their perceptions. We believe that embracing change and being excited about the prospect of improving the business is absolutely essential to successfully deliver innovation in the business.

Even if the overall perception of innovation is a positive one for staff, there is still a risk that their interest will be low in delivering the innovation within their area. Research from the **Harvard Business review**[1] has shown that engaging people from the very first stages of creating the innovation idea and ensuring that ownership of the idea is shared with all stakeholders gets them motivated to deliver it as they feel responsible for it when it originates from them. We will follow this approach and involve stakeholders in the initial detailed discussions but also

ensure we are flexible and take on board any suggestions they have during the delivery of the project.

Budgetary priorities can also be a barrier to the adoption of innovation and could delay business implementation. For this reason, we will be allocating £3m of annual budget specifically to fund our Business Innovation Programme.

Existing business processes such as procurement or IT development can decelerate the application of new innovation within the business. For this reason, in every Business Innovation Project, from the idea creations stage, we will be identifying all internal teams that will need to be involved in all stages of the Business Innovation Project and discuss with them the idea to agree on how it can be delivered overcoming existing issues. This will also be followed for any projects delivered within our Core Innovation Programme so that the solutions developed will be suitable for Business use and ready for roll-out on completion of the innovation trial.

Other industries have been successful in adopting innovation and we have identified how we can use their learning to shape our approach.

When Amazon were developing their idea for a new service called Prime Now (delivery within an hour), for example, they started by issuing a press release on it in order to capture their customers' reaction and thoughts. They then used that to shape their

new service, ensuring that it already meets their customers' needs and overcomes any potential issues or concerns customers would have. We will adopt a similar approach where we will publish information about a new technology or business change internally and invite comments from all of our teams. This will enable us to capture everyone's thoughts on the idea and incorporate them in the very early stages of scope creation and we expect this to produce a more positive response to the new project that it otherwise would.

Another example is Google's people-centric approach where every employee is empowered to innovate and develop new solutions, resulting in disruptive products and services being created. Our ultimate aim is for all of our staff to feel listened to and be motivated to push for their innovation ideas to materialise. We will be giving our staff the space and tools to be able to do that by training the innovation ambassadors of each business team to make them aware of how their teams can get involved in innovation. Following Google's approach, we will be giving our staff the opportunity to volunteer for the delivery of a new innovation that interests them or for the specification of a solution to a pre-determined challenge.

However, we will not stop here. Throughout RIIO-ED2 we will be continuously re-assessing our approaches and strive for improvement wherever possible so that we continue to learn from our experiences and the successes of others.

In order to ensure that we develop robust plans that will enable us to successfully deliver Business Innovation, we started from the basics first of understanding what the barriers could be and then shaping our plans in such a way to overcome them.

We will be continuously reviewing our approaches, capture any new barriers that are identified and explore how to overcome them using our experience and learning from the successes of others.

[1]https://hbr.org/2017/12/open-innovation-generates-great-ideas-so-why-arent-companies-adopting-them

Our Areas of Focus - Business Innovation Programme

Our Business Innovation work will focus on lower risk projects that can introduce efficiencies and enable us to reduce costs, therefore reducing our customers' bills. We will not limit this to specific areas of our business but instead ensure we have a broad portfolio of Business Innovation projects. Through our Business Innovation work we want to drive continuous business improvement and make our systems, processes and technologies as efficient as possible in any business area where there is space for improvement. Throughout RIIO-ED2, all our business owners will be able to submit their Business Innovation ideas through our new ideas portal for assessment to then be approved and scheduled for delivery.

Although we will not limit our Business Innovation work to specific areas, we have already engaged with all of our senior managers and captured their initial ideas in preparation for the start of RIIO-ED2. These include network performance, asset management, customer service and new connections support, fleet maintenance and management, regional energy modelling and carbon reporting, network planning and finance.

Additionally, our Business Innovation Programme will include the roll-out of successfully proven innovation delivered by us or other DNOs in previous price control periods and during RIIO-ED2. As part of that, among other solutions, we will be delivering the roll-out of System Voltage Optimisation (SVO), our centralised voltage control system that we successfully trialled in a previous LCNF project and our PrimeEV connection solution developed and trialled in a Business Innovation Project during RIIO-ED1.

Ensuring that we maximise the value for money that we extract from the innovation work we have delivered so far, we have already started re-assessing innovation projects which were completed in previous price control periods but concluded that it was too early for their outputs to be used in Business. During RIIO-ED2, we will deliver any of these projects that now have a strong business case and continue re-assessing previous work so that no opportunity of rolling out proven innovation is missed.

Through our Business Innovation Programme, we want to drive continuous business improvement and make our systems, processes and technologies as efficient as possible in any business area where there is space for improvement.

Although we will not limit our Business Innovation work to specific areas, our Business owners have already identified space for innovation in network performance, asset management, customer service and new connections support, fleet maintenance, regional energy modelling, network planning and finance.

Our Areas of Focus -
Ofgem Funded Innovation Programme

We are excited to continue running innovation projects funded through Ofgem funded mechanisms, more specifically the Network Innovation Allowance (NIA) and the Strategic Innovation Fund (SIF). NIA projects will focus overall on the energy system transition and vulnerable customers. Through the SIF, we will aim to tackle long term challenges through large scale strategically focused projects.

Whilst the portfolio of innovation projects will be balanced, there will be specific emphasis on the following themes over RIIO-ED2:

Decarbonisation – investigation and trial of new ways of reducing our carbon footprint in the 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, 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 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 (vehicle to grid) solutions, develop further solutions of connection of charging infrastructure as newtechnologies 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 Photovoltacis 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 Distribution System Operator (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.

Whole System Challenges and Collaboration

We know that in order to achieve Net Zero, we cannot be looking at our infrastructure in isolation. We need to be working with other key infrastructure providers and industries to find solutions that work for the whole system and provide the best overall benefit to the UK consumer.

This collaboration is necessary to facilitate the energy transition in the most economical way. We are passionate about driving this collaboration to bring together all the right people and jointly, strategically tackle the biggest challenges to decarbonisation. To achieve this, during RIIO-ED2 we will be running our Net Zero working group with key decision makers from other industries such as transport, utilities and manufacturing and we will use this working group to keep everyone up to date with each sector's strategic innovation plans, receive feedback on our innovation strategic plans, capture any impact on other sectors and overcome any barriers in regulation and governance that make collaboration difficult.

We have started strengthening our links with the water and rail industries and aim to collaborate on our first innovation projects before the end of RIIO-ED1. This process has already provided us with useful knowledge on how innovation is funded in different sectors, what the existing challenges are and solutions to overcome them.

Additionally, in RIIO-ED2 we want to increase our collaboration with international DNOs who are leading the industry changes in their countries.

We aim to do that by increasing our attendance at international events and conferences in order to expand our contact base, make new connections and work with them to understand in detail how they are innovating their energy system. From our current contacts with European DNOs, we have seen that we all share the same challenges and follow different approaches in addressing them. We believe that close collaboration between industry leaders internationally is the only way to effectively address global issues such as decarbonisation.

Collaboration with other industries is necessary to facilitate the transition to Net Zero in the most economical way.
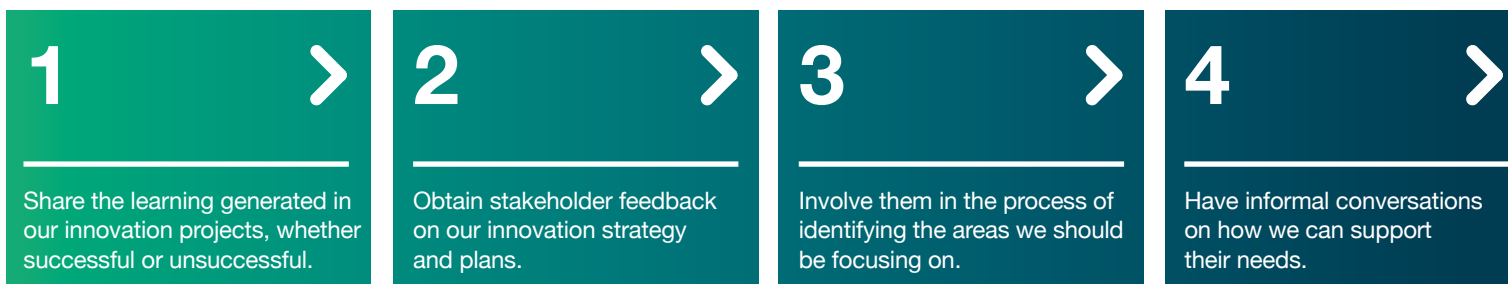
We are passionate about driving this collaboration and to achieve this, during RIIO-ED2 we will be running our Net Zero working group with key decision makers from other industries such as transport, utilities and manufacturing.

We will use our Net Zero working group to keep everyone up to date with each sector's strategic innovation plans, receive feedback on our strategic plans, capture any impact on other sectors and overcome the barriers in regulation and governance that make collaboration difficult.

Stakeholder Engagement

Stakeholder engagement remains a priority for our innovation team. We will continue to engage with our stakeholders regularly to:

1 >	**2** >	**3** >	**4** >
Share the learning generated in our innovation projects, whether successful or unsuccessful.	Obtain stakeholder feedback on our innovation strategy and plans.	Involve them in the process of identifying the areas we should be focusing on.	Have informal conversations on how we can support their needs.

Our bi-annual innovation events have been a great success and we will continue to run them both virtually and in person. We want our stakeholders to be able to engage with us in these events and share their views on our work. We will therefore ensure that we provide them this opportunity by dedicating specific sessions in our events for this and running workshops to facilitate open discussions.

Innovation remains a key theme for our Customer Panel, which helps us to prioritise future projects. In addition to innovation projects, the panel supports our work to assist the distributed generation community.

We also involve our Customer Engagement Group in our innovation plans to ensure that they align with our customers' expectations.

As well as our stakeholder engagement process, we look for feedback on innovation at other panels and groups wherever possible. We work closely with Regen, a renewable energy group in the South West of England, who are keen to support the introduction of renewable generation across their area.

We use the Distributed Generation forums, to seek other views and to compare our initiatives with those from other DNOs.

We support the Major Energy Users Council (MEUC) and have presented our innovation proposals to them for comment and feedback.

We also engage with Department for Business, Energy & Industrial Strategy and Department for Environment, Food and Rural Affairs (DEFRA) on related matters such as Climate Change Adaptation (CCA) that looks at the longer term effects of climate change on the UK electricity industry.

Additionally, we have close political engagement with MPs and locally elected representatives and actively engage in the development of regulatory and legislative policy. Our learning from innovation projects informs the proposals we make in our responses to consultations.

Sharing the learning on both our successful and unsuccessful projects remains a priority of our stakeholder engagement.

We are proud of our passion for continuous improvement and therefore always look for ways to improve our stakeholder engagement.

We will be creating a form on our website to collect feedback from our stakeholders on their entire journey with us, from when they first got in contact with us through to the stages of project creation and delivery. We will be continuously reviewing our existing processes and using the information collected to improve them whenever possible.

Keeping the Strategy up to date

Our innovation strategy will be subject to annual review to ensure that it continues to align with our innovation ambition and provide solutions in line with business requirements, industry developments, regulation and policy change but also customer needs.

We will continue to review our plans with our stakeholders to ensure that we allow them to challenge our proposals and shape what we do. Our plans will remain flexible so that we are able to address changing demands.

Through our collaboration with the Energy Networks Association (ENA) we will ensure that our approach to tackling the challenges of the future aligns with the industry and will continue to contribute to the ENA Innovation Strategy.

We expect external factors to influence our plan and feature as part of the review process, such as outcomes of the innovation work delivered by other DNOs, new technological developments achieved by manufacturers or changing customer behaviours.
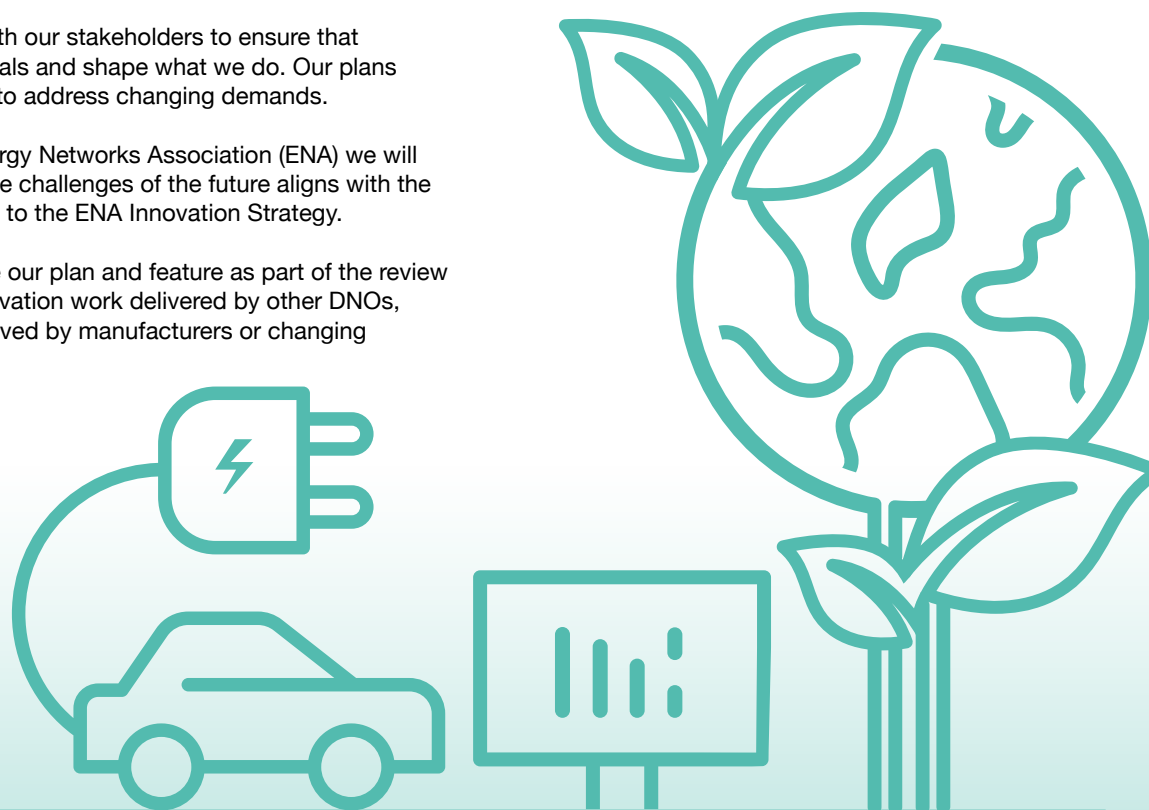
We will be updating our RIIO-ED2 Strategy on an annual basis or more frequently if needed to reflect rapidly changing external factors including government policy, stakeholder priorities and incorporate learning.

We will continue to review our plans with our stakeholders to ensure that our strategic focus aligns with their needs and priorities.

Conclusion

We are passionate about driving the changes needed in the electricity industry to decarbonise the energy system and we aim to continue leading the innovation work in our sector.

We want to be working with the best people to achieve excellence and provide value for money to our customers, in everything that we do.

If you have a great idea on how to tackle any of the challenges we are facing, we would like to hear from you.

Submit your project idea via our online form at:
www.westernpower.co.uk/wpd-nia-project-proposal-submission

WPD INNOVATION

Transforming the electricity network

How to Get in Touch

Find out more about all our projects, request access to project data and view upcoming innovation events at:

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