

Environment Report

2021-2022





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1 Introduction

1.1 Executive Summary

We are dedicated to achieving the highest standards of environmental performance, not only by minimising the environmental risks created by our activities, but also through targeted investment in outputs that deliver a positive environmental impact.

We are also determined to play our part in enabling the UK's transition to a Net Zero carbon future and the environmental benefits this will bring. This desire influences both our asset investment plans and the investments we make in measures to reduce our own carbon footprint.

To reflect our environmental ambitions, we included four headline environmental commitments in our business plan for the RIIO-ED1 period and have made further progress against achieving these in the seventh year of the RIIO-ED1 period;



Table 1: RIIO-ED1 Environment Commitments

Commitment	Measurement	Target	Target date	2021/22
Reduce losses	Annual gigawatt hours (GWh) saved	11	2021	Programme completed
Reduce carbon footprint	Tonnes of Carbon Dioxide Equivalent (tCO ₂ e)	10%	2020	37%
Reduce oil lost from cables	Litres lost	<30,000 per year	2023	13,266l
Undergrounding overhead lines in Designated Areas	km removed	As prioritised by stakeholders	2023	6km for a total of 51km

We have continued to connect new low carbon generation, developing innovative solutions to connect low carbon technologies along with investing over **£4m** in the smart meter roll-out in 2021/22.

As the country recovers from the Covid-19 pandemic, we continue to remain focused on achieving the responsible business goals that we set out, flexing our approach to meet our commitments throughout the past few years and unprecedented times. We continue to be able to make a significant difference in our communities, environments and ensuring the wellbeing of our colleagues and partners.

In 2021/22, we have also implemented a Distribution System Operator model which will transform how we operate and also deliver major benefits. The definition of a DSO, (as defined by the ENA), is an active distribution system comprising networks, demand, generation and other flexible distributed energy resources to deliver security, sustainability and affordability in the support of whole system optimisation.

1.2 Our business / who we are

We operate an electricity distribution network delivering power to five million people with 13,000 km of overhead lines, over 44,800 km of underground cables, almost 84,000 items of switchgear and more than 35,000 transformers. We do this through a workforce of 2,000 people; a large contractor workforce; a fleet of over 1,000 commercial vehicles, trailers and items of mobile plant; and 15 depot and office sites. Consequently, our activities create both risks and opportunities in regard to their impact on the environment.

The environmental risks we manage include those associated with holdings of electrical insulating oil (some of which may contain a constituent of polychlorinated biphenyl), waste management, vehicle emissions, holdings of sulphur hexafluoride gas (SF₆) and work in environmentally sensitive areas.

We have opportunities to minimise resource use and reduce waste to landfill. As the electricity distribution network operator for the north west of England we also have a key role to play in enabling the transition of our region to zero carbon energy, supporting the UK as a whole and our region in meeting its climate change targets.

Our network covers the most beautiful scenery within the UK and some of the areas make the maintenance of our assets challenging due to the rural locations and distances that are covered. We have a duty to maintain the network as well as maintain, protect and improve the environment we operate in, including;

- Ensure environmental planning is considered through all our design, planning and construction phases;
- Reduction of our carbon footprint;
- Protecting areas of outstanding natural beauty;
- Continue to improve distribution losses;
- Reduce SF₆ emissions and oil leaks; and
- Use innovation and stakeholder engagement to reduce our environmental impact.

Recognition of these obligations is reflected in our environment and energy management policy.

1.2.1 Environment and Energy Management Policy

We are committed to achieving excellence in environmental and energy management performance, minimising any adverse impacts our operations might have and fulfilling our obligation to manage energy and improve the environment that we operate in.

We will:

- Identify the environmental and energy using aspects associated with our activities, minimising those with any adverse impact whilst promoting those with beneficial impact;
- Comply with all applicable environment and energy management law and other relevant requirements and, where possible, exceed them;
- Integrate environmental performance and energy management considerations into business as usual processes including the setting and reviewing of objectives and targets;
- Operate and maintain systems of work that minimise adverse environmental impacts and seek to minimise energy usage whilst delivering beneficial impacts;



- Inform, instruct, train, supervise and equip people to identify and minimise adverse environmental impacts, maximise energy management opportunities and deliver beneficial impacts;
- Make environmental and energy management performance a factor in the selection of suppliers of goods and services;
- Implement and maintain a robust environmental management system that is certified to the ISO 14001 standard and an energy management system which is certified to ISO 50001;
- Manage the waste generated by our activities according to the principles of reduction, re-use and recycling;
- Minimise the carbon footprint of our business and actively contribute to the low carbon economy;
- Manage our business operations to prevent pollution and wasteful use of energy;
- Maximise the sustainability of natural resources used in our activities; and
- Develop and promote a culture of continuous improvement with regard to environmental and energy management performance.

To deliver this policy commitment we work to an environment strategy that is based on:

- A clear understanding and visibility throughout the business of environmental issues and impacts;
- Targeted investment and expenditure in environmental control measures;
- Strong corporate governance and performance management;
- Continuous learning and improvement; and
- A systematic approach to environmental management.

In line with this policy and to support our drive for excellence in environmental performance our environment and energy management system is certificated to the ISO14001 Environmental Management and ISO50001 Energy Management standards. Both these systems have been audited and verified by external auditors during 2021/22.

1 Introduction

1.2.2 Role of Stakeholders in Environmental Management

We have a stakeholder engagement strategy that includes working with a number of advisory panels. These are made up of stakeholders who are subject experts and represent our communities. One of our panels, the Sustainability Advisory Panel (SAP), focuses on sustainability challenges; ensuring our network can adapt to future challenges, such as the transition to zero carbon and Distribution System Operator (DSO), growth and development of community and local energy etc whilst keeping bills affordable.

Working in partnership with our SAP and a range of other stakeholders, including Greater Manchester Combined Authority, we are committed to our ambitious plan called 'Leading the North West to Zero Carbon'. This includes activities to drive down our own operational business carbon emissions, as well as those associated with the distribution network, and support our colleagues, business customers and partners to lower theirs. We plan to invest £63.5million over the remainder of RIIO-ED1 to deliver the plan, working with the SAP and other stakeholders to make it happen and to hold us to account;

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

As part of our leading the North West to Zero Carbon plan we have increased engagement with our employees around their opportunities for supporting the transition to Net Zero and are proud to have been the first DNO to be awarded the Silver Carbon Literacy standard.



We also meet regularly with our regional partners in relation to visual amenity in designated areas. Through this process our stakeholders play a key role in shaping our environmental strategy and investment priorities. This is covered further in section 2.1.

Over the last year, stakeholders and colleagues have also been involved in developing our 'Transforming our Communities' responsibility framework. This framework, launched in January 2019, part of our Corporate Social Responsibility (CSR) Strategy. The framework articulates our ambition to be a responsible business and creates a framework which captures our environmental, social and community ambitions. We are increasingly also working with our supply chain to raise awareness of our framework. We report our progress annually. It can be found at the following link:

<https://www.enwl.co.uk/about-us/transforming-our-communities/>

Stakeholder and customer engagement is critical to our existing activities and development of future plans and we were pleased to be one of the first distribution network companies to create an independent Customer Engagement Group (CEG). The role of the CEG is to challenge the company to ensure that we are prioritising our customers' needs in our future plans including reviewing our business plan for RIIO-ED2 (2023 – 2028). This process has included extensive customer and stakeholder research on priorities and willingness to pay.

Details of all our stakeholder engagement and how customers and stakeholders are able to get involved can be found via the following link:

[Engaging with our stakeholders \(enwl.co.uk\)](https://www.enwl.co.uk/engaging-with-our-stakeholders/)

1.3 Purpose of the Report

It is important to our business that customers and other stakeholders have a clear understanding of how we endeavour to minimise any adverse impact our activities might have on the environment and how we are taking advantage of opportunities to play our part in the transition to a Net Zero carbon economy.

The purpose of this report is to provide the detail on the progress we have made in the seventh year of the RIIO-ED1 (2015-2023) period in terms of our overall strategic environmental objectives and meeting the environmental targets we set out in our RIIO-ED1 business plan.

In parallel with delivering a reliable and safe network, we have continued our commitment to leading the north west to Net Zero. Collaboration is pivotal to our approach and working with our customers and stakeholders will ensure we provide the best support to our communities.

The report also gives an insight to how we are creating a low carbon network and our future by developing the technology and systems along with a low carbon mindset to preserve biodiversity and ecosystems by driving down our carbon emissions.

2.1 Introduction

There are three National Parks and four Areas of Outstanding Natural Beauty (AONB), collectively known as Designated Areas, either wholly or partially within our region. These are:

- Arnside and Silverdale, Cumbria (AONB)
- Forest of Bowland, Lancashire (AONB)
- North Pennines, Cumbria (AONB)
- Solway Coast, Cumbria (AONB)
- Lake District National Park
- Peak District National Park
- Yorkshire Dales National Park

We have a programme of undergrounding overhead lines for visual amenity benefits in Designated Areas and we have worked closely with regional partners to ensure its success since its inception in 2005. As part of our wider stakeholder engagement plan, we meet annually with representatives from the above Designated Areas to share information on the individual programmes of work in each of the areas and current topics of interest. Each of the designated area statutory body representatives, together with Friends of the Lake District and Friends of the Peak District, meet with ENWL planners on a regular basis to identify the lines to be undergrounded in their area and to ensure programmes are progressed.

Our investments have also been leveraged by regional partners to deliver greater environmental value and secure additional funding from other sources. This includes £7.9m of National Lottery Funding for a range of landscape improvement programmes in two of the Designated Areas above. In our RIIO-ED1 business plan we planned to invest £10.8m (20/21 prices) undergrounding overhead lines by 2023. This was assumed to equate to 80km in our published business plan commitments based on assumptions as to the average unit cost of undergrounding the overhead circuits.

In 2021/22 we continued our activity inside Designated Areas, removing a further 5.6km of overhead line and installing 8.2km of replacement underground cable. At the end of the seventh year of RIIO-ED1, we have now removed a total of 51.3km of overhead line and invested £8.6m (20/21 prices). We still intend to invest the totality of our entitlement of £10.8m (20/21 prices) over the RIIO-ED1 period but some of the sites selected by stakeholders, whilst high in amenity value, are costlier than originally anticipated. Hence, it is likely that the total length undergrounded over the period will be around 64km at the end of RIIO ED1.

Table 2 gives details of the schemes completed in 2021/22 and Table 3 shows the projects planned for completion in 2022/23.

Table 2: Visual Amenity Completed Projects Summary 2021/22

Designated Area	Scheme	Overhead Line Removed (km)	Underground Cable Installed (km)	2021/22 Expenditure (£k)
Peak District	UVA Reaps Farm-Higher Deep Clough	1.8	2.7	85.8
North Pennine	UVA RSPB Tindale Tarn	1.9	2.1	316.1
Lake District	UVA Hole House Farm Pooley Bridge	0.7	1.8	202.7
Lake District	UVA Meathop Moss	0.7	1.0	139.9
Lake District	UVA Redmire Mungrisedale	0.5	0.6	77.5
TOTAL		5.6	8.2	822.0



2 Managing our Environmental Impact

Table 3: Visual Amenity Planned Projects to be Completed 2022/23

Designated Area	Scheme	Overhead Line to be Removed (km)	Underground Cable to be Installed (km)	2022/23 Expenditure (£k)
Yorkshire Dales	UVA Raisebeck Stone Circle Orton	1.8	2.3	47.8
Lake District	UVA LV Dacre	0.3	0.4	5.0
Lake District	UVA Dacre Village South	0.2	0.3	59.4
Lake District	UVA A66 to Dacre	1.8	2.3	353.1
Lake District	UVA Aughtertree Calbeck	1.2	1.6	245.5
Lake District	UVA LDNPA Helton	1.1	1.4	197.5
Lake District	UVA Bampton Grange	0.3	0.4	61.2
North Pennines	UVA Swindalehead Brough	1.5	1.8	7.5
Arnsdale & Silverdale	UVA Warton-Barrow Scout	1.8	1.5	63.0
Lake District	UVA Thompson Ground Hawkshead Hill	1.2	0.1	332.8
Lake District	UVA Helsington Church Helsington	1.0	1.5	135.7
North Pennines	UVA Clesketts - Howgill Hallbankgate	1.2	0.2	299.7
TOTAL		13.4	13.8	1808.2

Details of our strategy for project assessment and delivery, analysis of costs and benefits, stakeholder engagement and support and our approach to the assessment of projects is included in our document Undergrounding for Visual Amenity – Scheme Selection and Design Process 05 May 2016 which can be downloaded from the following link;

<https://www.enwl.co.uk/globalassets/stakeholder-engagement/documents/engagement-publications/undergrounding-for-visual-amenity/2016--underground-for-visual-amenity.pdf>

This strategy is pivotal in the planning and preparation of any work being carried out and is visited each year to ensure continual deliver against the strategy and compliance. The data relating to our visual amenity activity can be found in worksheet E1 of the Environment and Innovation Reporting Pack in the appendices of this report.

2.2 Oil Leakage from Cables

We have used fluid-filled cables since the 1960s as part of our extra high-voltage distribution network at 132,000 and 33,000 Volts. The fluid acts as an electrical insulator and will be either mineral naphthenic oil or linear alkyl benzene or a mixture. In all cases the fluids have a low viscosity and colour, not unlike water.

Leaks from fluid-filled cables can occur for varying reasons including: cable damage by third party excavations; cable damage due to installation failure; failure of ancillary oil equipment such as pipe work, monitoring gauges and oil tanks; and cable joint failure. Whilst only a very small percentage of cables ever develop leaks, a leak can present a significant environmental risk if it is adjacent to a water course or an aquifer.

When leaks are detected we respond in accordance with requirements, including response times, of the joint Environment Agency and Electricity Companies Operating Code on the Management of Fluid Filled Cable Systems Issue 3, 2013. Our strategy to address leakage from fluid-filled cables is to replace them with alternative modern fluid-free cabling and to respond quickly to leaks on legacy circuits.

We have committed in our RIIO-ED1 business plan to maintain a leakage rate of less than 30,000 litres per year by 2023. In 2021/22 a total of 13,226 litres of oil was lost representing 1.24% of the total oil in service.

The data relating to our oil leakage activity can be found in worksheet E2 of the Environment and Innovation Reporting Pack in the appendices.

2.3 Carbon Impact and Climate Change

2.3.1 Business Carbon Footprint

Within our Environment and Energy Management Policy we have committed to minimise the carbon footprint of our business and actively contribute to the transition to a zero carbon economy. The carbon footprint is a measure of the impact of our business on the environment through our emissions of greenhouse gases.

The target set in our RIIO-ED1 business plan was to reduce our 2014/15 business carbon footprint (excluding losses) by 10% by the end of 2020/21. We have exceeded this target, achieving a reduction of 37, and will target further reductions throughout the final year of the RIIO-ED1 period.

In 2021/22, we continued to realise the benefits from our investment in fuel efficiency including reduced vehicle weights, installation of engine rev limiters and educating our drivers on the most efficient manner in which to use our fleet. Further investment in the refurbishment of our buildings also took place including the installation of more energy efficient equipment. This investment, alongside continued promotion of energy reduction behaviour with our employees, is driving down the electricity used to power our buildings.

The higher CO₂ contribution from generators was mostly off-set by our improved performance for electricity in our buildings, meaning that our business carbon footprint (excluding losses) for 2021/22 was 14,649 tCO₂e, an increase of 559 tCO₂e on the previous year. This means that we have delivered an average saving of over 3,213 tCO₂e per year over the first seven years of the plan compared to the baseline.

Table 4: Business Carbon Footprint 2021/22

Emissions	2021/22 Tonne CO ₂ e	2020/21 Tonne CO ₂ e	2019/20 Tonne CO ₂ e
Scope 1			
Operational transport (direct labour)	4,201	4,119	3,653
Operational transport (contractors)	1,855	1,578	3,196
Business transport – road	787	925	1,343
Fugitive emissions - SF ₆	877	1,488	1,772
Fugitive emissions – other	16	16	15
Fuel combustion	3,275	1,967	2,560
TOTAL	11,011	10,093	12,540
Scope 2			
Buildings energy usage	3,628	3,995	4,845
TOTAL	3,628	3,995	4,845
Scope 3			
Business transport – rail	1.56	0.29	21
Business transport – air	7.18	1.34	99
TOTAL	8.74	1.63	120
Business Carbon Footprint (exc. losses)	14,649	14,090	18,051
Losses	282,989	297,299	293,793
Business Carbon Footprint (including losses)	297,638	311,389	311,844

The data relating to our business carbon footprint can be found in worksheet E3 of the Environment and Innovation Reporting Pack in the appendices.

2 Managing our Environmental Impact

2.3.2 Sulphur Hexafluoride Emissions (SF₆ emitted)

SF₆ is a gas with excellent electrical insulation and other properties, which have led to its widespread use in electrical switchgear and in a number of other industrial applications. However, there is concern over any SF₆ that escapes into the atmosphere since it is a potent greenhouse gas.

In terms of our strategy to address the level of SF₆ emitted, we contribute to the overall UK electricity transmission and distribution industry in supporting Government initiatives to ensure the implementation of sound policies for the control and use of SF₆. The European electricity industries have also agreed a set of actions to reduce emissions of the gas to the atmosphere with manufacturers of electrical equipment. Leakage rates are being reduced in cooperation with power equipment manufacturers under a programme of continuous improvement.

On a company level our current policy is to continue to install modern SF₆ equipment with lower leakage rates and leakage monitoring. Over the RIIO-ED1 period we plan to reduce our leakage rate by over 20% from a rate of 0.38% (as a proportion of the mass in service) in 2013 to 0.30% by 2023.

In 2021/22 a total of 38.47kg of SF₆ was lost from our system (which is a rate of 0.25%), with a carbon equivalent of 877 tCO₂e. The data relating to our SF₆ holding, leakage and associated carbon footprint can be found in worksheets E2 and E3 of the Environment and Innovation Reporting Pack in the appendices.

We have examined the potential for reductions through the application of various alternative investment strategies during the RIIO-ED1 period...



2.3.3 Distribution Losses

When electricity is generated not all of the electrical energy which flows through the power network reaches the customer. This is because power networks use some of the energy in the process of transporting the electricity to customers. In the broadest sense, distribution network losses are the difference between the electrical energy entering the distribution network, and the electrical energy that leaves it. Some losses are associated with the technical characteristics of the electricity network ('technical' losses), whilst other losses are more to do with measurement and billing ('non-technical' losses).

Losses cost customers money and contribute to carbon emissions. They can be reduced in various ways but these measures also cost money. At Electricity North West we act on behalf of our customers to determine the appropriate balance between spending money on reducing losses and saving money for customers by lowering the energy lost during transportation.

The overall level of losses is influenced to a greater extent by electricity usage i.e. the more electricity consumed, the more power transmitted and distributed, the more losses and vice versa. This movement in losses is reflected in the total losses associated with our network.

In 2021/22 losses¹ were 1,263,788,904kWh or the equivalent of 268,340 tCO₂e. This was an increase of 49,028,257kWh from 2020/21 which, together with a change in the UK government electricity conversion factor, equated to an equivalent reduction of 14,869 tCO₂e.

We can proactively target losses reduction and our strategy is to continually review the options for reducing the losses on our network. We have examined the potential for reductions through the application of various alternative investment strategies during the RIIO-ED1 period and are adopting, as policy, only those strategies that deliver clear positive benefits for our customers.

We also plan to maintain and expand our activities to investigate and minimise non-technical losses, such as theft, while continuing to establish a more reliable reporting baseline for losses within RIIO-ED1.

As part of this strategy we have identified a number of priorities for reducing both technical and non-technical losses summarised in Table 5 below.

¹ It should be noted that the reported losses figure is a snapshot of received data as of the date of the 2021/22 RRP submission and will change as further settlement reconciliation runs are carried out (up to 28 months after each relevant settlement date).

Table 5: Losses Strategy Summary

Investment	Actions	
Technical losses		
Distribution transformers (ground-mounted)	Replace old (pre-1990) large, ground-mounted, secondary network transformers with capacities of 800kVA and 1000kVA with lower loss EU Eco design	Proactive
Primary transformers	When installation or replacement required, replace with lower loss EU Eco design	Opportunistic
Grid transformers	When installation or replacement required, determine best type to reduce losses with all new transformers lower loss EU Eco design	Opportunistic
Distribution transformers (pole-mounted)	When installation or replacement of larger pole-mounted secondary network transformers required, replace with lower loss EU Eco design	Opportunistic
Cables (high voltage and low voltage)	Install large-cross section cables (300mm ²) at both HV and LV as standard	Opportunistic
Non-technical losses		
Transactional theft	Continue to work alongside suppliers to help reduce transactional theft	Proactive
	Monitor / share best practice with other DNOs	Proactive
Theft in conveyance	Develop our theft in conveyance services	Proactive
	Contribute to the development of the National Revenue Protection Code of Practice	Proactive
	Increase number of investigations undertaken	Proactive
	Monitor / share best practice with other DNOs	Proactive
Unmetered supplies	Undertake regular audits of unmetered supply inventory	Proactive
Network Innovation Strategy		
OFGEM Innovation Funding	Review and analyse the details of the innovation projects	Proactive

Our losses strategy can be found at the following link:

<https://www.enwl.co.uk/go-net-zero/our-plans-to-go-net-zero/electrical-losses/>



2 Managing our Environmental Impact

A summary of our activity in reducing losses in 2021/22 is presented in the tables below.

Table 6: Summary of Losses Costs and Benefits from Activities in RIIO-ED1

Programme/ project title	Regulatory Reporting Year 2021/22			RIIO-ED1
	Distribution Losses – Justified Costs	Reduced Losses	Reduced Emissions Associated with Losses	Cumulative reduced losses to date
	£m	GWh	tCO ₂ e	GWh
Standardise use of 300mm ² HV cable	0.55	11.87	2,768	43.09
Standardise use of 300mm ² LV cable	0.93	5.56	1,297	18.86
Proactive replacement of pre-1990 1000kVA transformers	0.00	5.73	1,336	23.34
Proactive replacement of pre-1990 800kVA transformers	0.00	4.88	1,137	16.09
Opportunistic primary transformer replacement	0.28	2.46	574	8.91
Opportunistic 200kVA pole-mounted transformer replacement	0.02	0.23	53	0.80
Relevant theft of electricity action	1.04	11.56	2,696	54.16
TOTAL	2.83	42.29	9,860	165.24

Table 7: Summary of Losses Activity in 2021/22

Programme / project title	Description of unit	Volumes in 2021/22
Standardise use of 300mm ² HV cable	km of cable	57
Standardise use of 300mm ² LV cable	km of cable	24
Proactive replacement of pre-1990 1000kVA transformers	Transformers	0
Proactive replacement of pre-1990 800kVA transformers	Transformers	0
Opportunistic primary transformer replacement	Transformers	6
Opportunistic 200kVA pole-mounted transformer replacement	Transformers	7
Relevant theft of electricity	Theft cases identified	326

The data relating to our loss reduction activities can be found in worksheet E4 of the Environment and Innovation Reporting Pack in the appendices.

The cost and benefit analyses for our innovative solutions are included in the appendices.

2.4 Other Environment Related Activities

2.4.1 Energy Management System

To underpin our target of reducing our business carbon footprint, we have implemented an energy management system (ISO 50001) across the company. Our certification includes the direct energy consumed within our building assets and fleet vehicles, in addition to indirect consumption associated with business travel, distribution losses and fuel used in generation whilst maintaining supplies.

As part of the system, we monitor our energy consumption, identifying opportunities for improvement, supporting our wider decarbonisation targets. Some of the recent initiatives to reduce consumption include:

- Temperature and power monitoring system, optimising employee comfort and asset performance;
- Window upgrades to improve thermal performance;
- LED lighting installations across depots;
- Air source and ground source heat pump installations; and
- Solar PV installations.

The system was audited and verified by an external organisation during 2021/22 and we have maintained certification to the ISO 50001 Energy Management Systems standard.

2.4.2 Hazardous Waste

Our oil recycling facility at Blackburn continues to play a significant part in managing our environmental impacts by allowing us to minimise the use of raw materials and disposal of waste oil.

2.4.3 Noise Complaints

We received 18 noise-related complaints in 2021/22 compared to one in the previous year. The complaints in the year were related to substation noises which were dealt with through our customer service processes.

The data relating to noise complaints can be found in worksheet E2 of the Environment and Innovation Reporting Pack in the appendices.

Working closely with councils, residents and local community groups, a number of substations were identified under the 'Transforming Our Spaces' scheme...

2.5 Enhancing Biodiversity and Ecosystems

Following an annual Stakeholder Engagement workshop, feedback received wanted a review on how to mitigate any negative impacts that our operational activities such as powerline vegetation management might have on wildlife and biodiversity. Additionally, the 'Youth Focus North West' members also stressed the importance of replacing trees felled and preserving others during such operations. Consequently, a commitment was made to plant 50,000 trees over the RIIO ED2 period to replace losses during felling work and ENWL tree surveying staff received specialist training to risk assess and retain trees of antiquity or wildlife value.

Working closely with councils, residents and local community groups, a number of substations were identified under the 'Transforming Our Spaces' (TOS) scheme, which were subjected to grounds clearance and biodiversity enhancement programmes. This was implemented during the Covid-19 lockdown following all the necessary guidelines to turn the sites into colourful wildflower meadows and safe habitats for wildlife. The project benefitted pollinating insects and reduced the amount of ongoing maintenance previously needed in the substation areas.

This successful project, which has already enhanced 20 sites to date, is to be extended over the ED2 period to uplift the baseline biodiversity of a further 100 sites. This is planned to be achieved through joint oversight of an expert Biodiversity Manager, with potential to connect TOS sites through schemes such as the charity Buglife 'Bee Line' corridor strategy at a regional landscape scale.

A Biodiversity Working Group ran between 2018 – 2021 that met regularly to discuss opportunities to enhance our work around biodiversity. The group undertook a review of our Biosecurity Guidance and provided advice to colleagues and contractors. The management and control of invasive species has had a strong focus, particularly concerning Himalayan Balsam, Japanese Knotweed and Giant Hogweed.

We have removed several sites off the knotweed control list this year, successfully eradicating the colonies which are incredibly damaging to local biodiversity, and to nearby properties' and structures. Colleague communication campaigns have successfully enhanced colleague awareness and early identification of Giant Hogweed has prevented colleagues coming to harm.

We also actively worked with local communities to restore and preserve nature and we continue to use the 'Green Book,' which is a ready to use internal guide to help raise awareness with our colleagues of tree hazards and invasive species within our region so that we can have our entire operational workforce addressing these issues.

In the coming year, we will identify appropriate biodiversity net gain and natural capital tools which can be used to measure our environmental impacts. For strategic developments and network connection work, we will employ the DEFRA Biodiversity Metric V3.1, which is a tool to ensure we achieve a statutory 10% net gain in biodiversity on these sites as is required by the Environment Act from 2023, and on Nationally Significant Infrastructure Projects from 2025. Following external consultation and research, we will adopt a Natural Capital tool provider to assess the ecosystem provision of our estate including baseline biodiversity.

2 Managing our Environmental Impact

2.6 New Tree Planting Partnership

GMCA (Greater Manchester Combined Authority) committed to plans for 3 million new trees to be planted in the city area over the next 25 years.

We have entered into a new partnership with City of Trees to support this, which has lead us to donate two sites - one at Westhoughton in Wigan and one in New Mills in Derbyshire for tree planting, leveraging the newly granted DEFRA fund (Trees for Climate). Up to 600 trees will be planted and we are reviewing the feasibility of donating at least another three sites and offering volunteering opportunities to our staff for next year's planting season.

We have publicly committed to planting 50,000 trees within our licence area over the 2023 – 2028 period, which will be delivered via the blended approach of planting suitably assessed parts of the ENWL estate and funding tree establishment on third party partnership land.



2.7 Employee Carbon Literacy Training

Carbon literacy is vital climate change learning that catalyses action to reduce greenhouse gas emissions. Today more than 37,000 individuals and 3,500 organisations are carbon literate in countries all over the world.

We received our Carbon Literate Organisation (CLO) silver award in July 2022, after receiving our Bronze award at the Greater Manchester Green Summit in March 2019. The awards recognise our increased commitment to acting on climate change, supporting colleagues to take action and sharing knowledge and best practice around carbon literacy with the sector and region.

To build on the success of achieving this accreditation and to drive further cultural change across our business, we have rolled out carbon literacy training to our leadership team. This will encourage them to reduce their own carbon emissions and those they are responsible for in the workplace. We also took part in the first-ever carbon literacy action day that coincided with COP26, the United Nations climate change conference, where we delivered training to some of our network partners.

From March 2023 we will deliver training to a further 35% (750) of our colleagues on our journey to achieve gold accreditation, using a hybrid approach of face-to-face and online learning. We'll deliver training to our network contract partners and agencies who are helping our vulnerable customers on their journeys to Net Zero carbon. We intend to develop a toolkit to support other organisations on their carbon literacy journey and have already delivered training to our sister company Electricity North West Construction and Maintenance which is now a Bronze Carbon Literate Organisation (CLO).

2.8 Sustainability Advisory Panel

We have engaged substantially with our Sustainability Advisory Panel, made up of subject matter experts from across a range of environmental and sustainability issues, including those from local authorities, the Environment Agency and other utility providers. This has included sessions which have identified focus areas, including the need to be more mindful of our impacts on biodiversity and natural capital, as well as to understand and address our indirect environmental impacts.

The Sustainability Panel has provided a direct impact on our future Environmental Action Plan by recommending the inclusion of our scope 3 carbon emissions for inclusion within science-based targets for the reduction of our overall business carbon footprint.

3.1 Introduction

As the electricity distribution network operation for the North West of England, we have a key role to play in enabling the transition of our region to Net Zero and supporting the UK as a whole in meeting its climate change targets.

Innovation is key to the success of our organisation and is where novel techniques and potential solutions, whether they be technological or commercial, are analysed, developed, trialled and ultimately transformed into practical solutions to deliver a better, zero carbon service for our customers; improve network performance and safety; and deliver ever more efficient ways of working.

At the core of our innovation strategy is delivering value to customers through maximising the use of existing assets and offering new services and choice for the future. We are generating value for customers now by deploying proven technology providing innovative solutions to real problems.

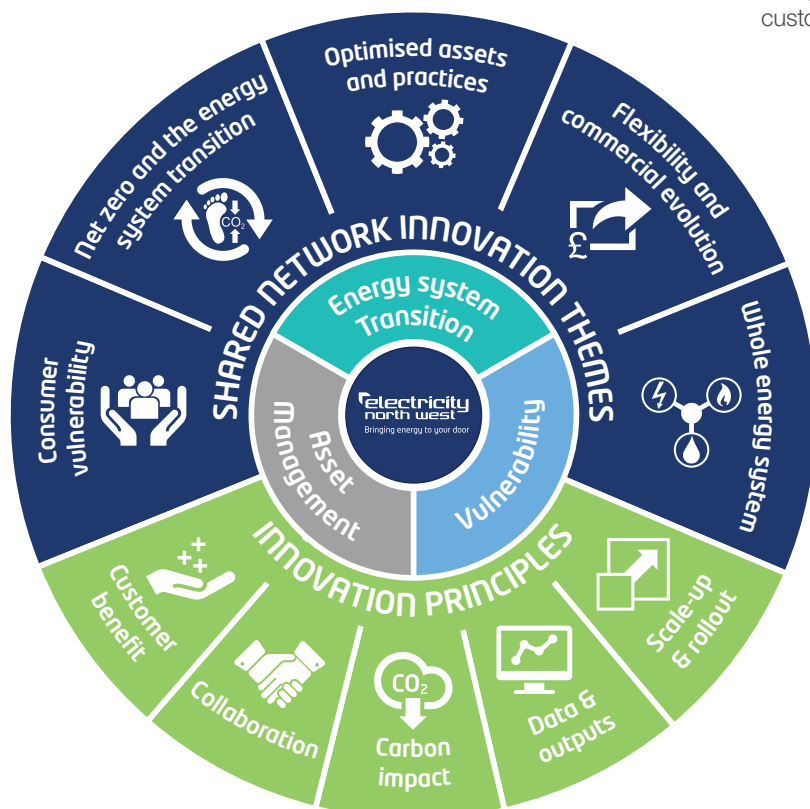
This section describes our activity in 2021/22 in regard to smart grids, innovation and how we are fulfilling our commitments in this area.

In January 2021, we published our new innovation strategy which describes how innovation will help to address the challenges of energy system transition, while maintaining a safe and reliable network and ensuring that the most vulnerable in our communities can benefit from changes we make elsewhere in the energy industry.

<https://www.enwl.co.uk/globalassets/innovation/innovation-strategy/innovation-strategy-downloads/innovation-strategy-2021.pdf>

This update allowed us to align our themes with those of the ENA Electricity Network Innovation Strategy and look forward towards RII0-ED2 and beyond.

Our strategy at a glance



3.1.1 Key Challenges

For the purposes of thinking about innovation, the challenges can be split into three broad areas:

- Government initiatives on energy efficiency, carbon costs, renewable energy generation and electric vehicles combined with increasing customer awareness of energy issues will drive changes in customer behaviours that will impact significantly on electricity consumption in terms of patterns and levels of demand;
- The energy system transition could lead to our more vulnerable customers being left behind or otherwise disadvantaged if they are unable to access the new technologies and innovative services available; and
- Our assets are ageing with many now approaching their previously assumed end of life at a time when we are asking them to perform new functions.

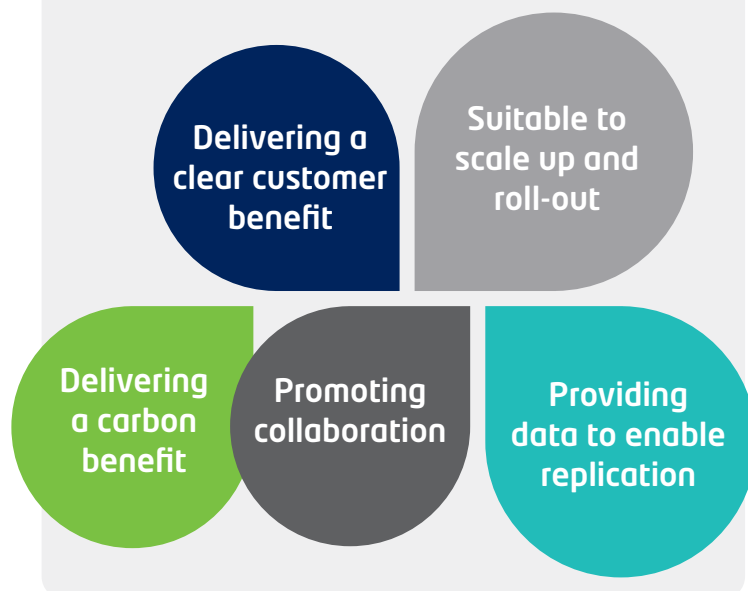
Equally the opportunities these challenges present and the new technologies that are emerging to tackle them are broadly consistent;

- New technology itself has the overall ability to add value to our business by enabling improvements in customer service and reducing costs;
- Smart meters will allow us to monitor how much power our customers are using or producing in near real time and allow us to positively influence usage and operate the network more responsively;
- New markets are emerging through which customers can earn value while helping solve network constraints;
- Regulatory models can be developed that support changes needed;
- The Distribution System Operator (DSO) will have a central role in determining where innovation is required; and
- Energy storage can help us manage demand uncertainty and help customers and communities improve energy efficiency.

We are generating value for customers now by deploying proven technology providing innovative solutions to real problems.

3 Smart Grids, Innovation and Our Role in The Low Carbon Transition

Our innovation strategy is built to resolve these new challenges and to realise the opportunities. To ensure our innovation projects are aligned with the needs of stakeholders, and that all deliverables are communicated in a manner consistent with our industry peers, our five innovation principles are the pillars which underpin all of our innovation projects;



In line with this strategy we have developed a range of projects, some of which have been completed and a number of which are currently in flight. All projects are designed to support one or more of our key innovation themes which are shown in the “Strategy at a Glance”.

Full details of our innovation work can be found on our dedicated innovation web pages through the following link:

<https://www.enwl.co.uk/innovation>

The data relating to the benefits of using innovative solutions to respond to the challenges set out above can be found in worksheet E6 of the Environment and Innovation Reporting Pack in the appendices.

The cost and benefit analyses for our deployed innovative solutions are included in the appendices.



3.2 Progress of the Innovation Strategy

During 2021/22:

- We closed two Network Innovation Allowance (NIA) funded projects including our machine learning project which gave insights into improvements to our fault location algorithms, as well as our asset condition monitoring.
- We have registered three NIA projects including the Hyperspectral imaging for spoil classification project, which aims to develop a portable unit to allow classification, on site, of spoil as hazardous or not.
- We have eight NIA projects in-flight including Interface which is looking to rationalise the data architecture in our distribution substations, allowing us to gain greater visibility of loadings at a more granular level.
- We started work on our Network Innovation Competition (NIC) project BiTraDER which is looking to demonstrate how access to a neutral market allows connected resources to trade their obligations bilaterally, encouraging more of them to offer flexible services, increasing availability of flexibility and thereby reducing whole system costs.
- We have continued our delivery of the NIC project QUEST which is looking to produce an overarching, holistic, control system which optimises the performance of our existing systems.

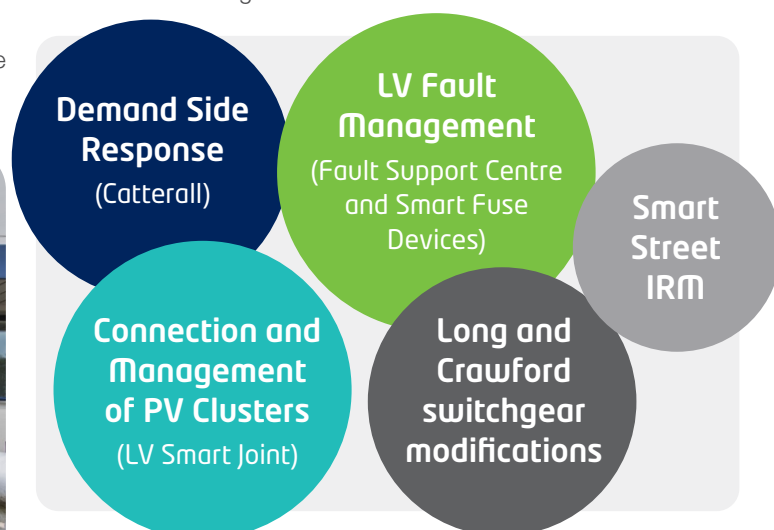
Further details of our innovation projects and how they address our strategy can be found in our NIA annual summary report via the following link:

<https://www.enwl.co.uk/globalassets/innovation/nia/nia-reports-and-literature/nia-annual-summary-report-2022.pdf>

Several innovative solutions have now become business as usual and are being used to reduce costs and improve quality of service.

3.2.1 Summary of Innovative Solutions Deployed

There are five Innovative Solutions which form part of our business as usual activities during 2021/22:



Oil Regeneration and Online Transformer Monitoring are presented below as separate projects; however, for the purpose of the Cost Benefit Analysis (CBA) (Transformer Regeneration) they are brought together in combination to provide the innovative solution, to avoid double counting of the associated costs and benefits.

Demand Side Response

What the solution is:

Catterall Waterworks Primary Substation has a single 7.5 MVA transformer and a firm capacity of 5 MVA, limited by High Voltage transfer capacity. The peak demand at the substation is 7.41 MVA, which exceeds the firm capacity by 2.41 MVA causing a compliance issue with ENA Engineering Recommendation (EREC) P2/7 - Security of Supply. The non-compliance issue only exists when the system is operating abnormally due to the loss of the transformer or the circuit supplying the transformer (i.e. under a fault situation), as the demand exceeds the transfer capacity.

By entering into a commercial agreement for the purchasing of DSR services, ENWL is able to defer the reinforcement of this primary substation and maintain compliance with EREC P2/7 as it ensures that the demand does not exceed the capacity when the system is abnormal.

How it is being used:

Under system abnormal conditions, ENWL will switch out a circuit at Catterall Waterworks primary to reduce the demand at the customer's site, to enable the restoration of supplies connected to Catterall primary so the transfer capacity of 5 MVA is not exceeded. The customer has agreed to have their demand reduced by 3 MVA for up to eight hours to allow time for ENWL to identify and resolve the issue.

How it is delivering benefits:

Demand Side Response limits the demand on Catterall Waterworks primary which is constrained by the transfer capacity for the loss of the transformer. With continuous monitoring this provides the opportunity to defer or mitigate the need for reinforcement in the future if demand increases or arrangements change.

Transformer regeneration

What the solution is:

The condition of the oil in the transformer main tank is a good proxy of the general condition of the transformer as a whole. It has been shown from recent research that via unique application of transformer oil regeneration (a process whereby transformer oil is cleaned through an on-site process) can result in an improvement in overall condition of the transformer. When this is used in conjunction with enhanced transformer monitoring, this can improve the Health Index and extend the expected life of the transformer.

How it is being used:

Transformer regeneration is being used as an alternative to traditional asset replacement. The regeneration activities are being undertaken on those assets which are categorised as 'end of life' due to their Health Index and/or criticality level. Regeneration activities are also being undertaken on those transformers categorised as 'mid-life' in order to determine the optimum point in a transformer's life cycle to implement oil regeneration activities to further extend the life of the asset.

How it is delivering benefits:

The financial benefits from this innovative solution are derived from transformer life extension and hence deferment of asset replacement costs. Other benefits include quality of supply benefits which relate to improved understanding of the risk of failure of older transformers and a better insight into the oil ageing process. The environmental benefits result from extending the life of an existing transformer and its oil therefore reducing the requirement for disposal of and/or recycling of used oil and scrapping the transformer. However, additional losses are incurred due to the delayed implementation of modern equivalent transformers.

This is used in conjunction with the Online Transformer Monitoring (described below).



3 Smart Grids, Innovation and Our Role in The Low Carbon Transition

Online Transformer Monitoring

What the solution is:

As transformer life is extended through the use of techniques such as transformer oil regeneration, network operators must be certain that the refurbished units will continue to operate both safely and reliably. To support this, a real-time condition monitoring system has been developed which provides us with enhanced information on each refurbished transformer via an on-line information dashboard.

How it is being used:

Transformer monitoring is being fitted to all transformers which have had their oil regenerated in RIIO-ED1 for a period of time to confirm (via observable data) that both the initial condition of the transformer is improved and that this improved condition is maintained thereafter. The solution is being used as part of our intervention plan to extend the life of a large number of 132kV and 33kV transformers. The technology is fitted to targeted transformers for a short period prior to the commencement of the oil regeneration process and continues for a defined period thereafter.

How it is delivering benefits:

The condition monitoring provides us with confirmation that the transformer regeneration process has been successful in improving the condition of the transformer oil and thus the main tank. The combined online transformer monitoring is a key enabling technology for the refurbishment of large volumes of 132kV and 33kV transformers under the transformer regeneration innovative solution.

LV Fault Management - Fault Support Centre

What the solution is:

The Fault Support Centre (FSC) is an enhanced Low Voltage network fault management solution which makes use of the increased penetration of intelligent devices such as the Bidoyng coupled with an innovative commercial partnership with a third-party provider (Kelvatek). The FSC provides a real-time operational management of low voltage networks to allow for the proactive management of faults. The data obtained can be further used to target areas of the network which would benefit from asset replacement.

How it is being used:

This solution is being used as the business-as-usual approach for how all transient faults are managed. In the event that a transient fault is detected, a smart fuse device such as the Bidoyng or Weezap is fitted to the suspect LV network. Kelvatek is informed of the installation event and data recorded by the Bidoyng/Weezap in real-time to monitor the suspect network.

Kelvatek will continue to monitor the affected networks until they have determined the potential location of the fault causing the transient supply interruption and issued an instruction to our field teams to investigate with the aim of locating and removing the fault or proving that the transient fault is no longer active. In both cases, the equipment will be recovered and redeployed elsewhere.

How it is delivering benefits:

The Fault Support Centre allows for the proactive management of LV transient faults. Our customer engagement activities have shown that these types of fault are one of the biggest cause of customer dissatisfaction. The ability to repair these faults before they have chance to progress into a permanent fault will significantly reduce the number of associated faults and reduce customer disruption accordingly.

Further benefits flow from the reduced CI and CML and associated fault costs that the proactive management of faults delivers.



LV Fault Management - Smart Fuse Devices

What the solution is:

The smart fuse devices produced by Kelvatek such as the Bidoyng and the Weezap act as an innovative replacement for the standard low voltage fuse. They provide a multi-shot re-close feature as opposed to the single operation offered by the standard fuse. This means that customer supplies can be automatically restored in the event of a transient fault, reducing the number of customer interruptions and customer minutes lost and the costs associated with managing our response to a loss of supply. This enhanced approach to LV faults also improves customer satisfaction.

In addition, this equipment provides increased network visibility via its ability to measure and transmit to our Network Management System key network parameters and make this available in near real-time.

How it is being used:

These smart fuse devices are used to reduce the customer impacts of faults, facilitate increased understanding of the impact of the connection of low carbon technologies and improve the management of network faults.

These devices are acting as enablers for a number of innovation solutions and applications. In particular, they are a key tool in the management of low voltage transient faults. These faults are intermittent in nature and are often difficult to find and repair. The Bidoyng is used to both minimise the customer disruption associated with a fault (i.e. by automatic restoration of supplies) and to help engineers to locate the fault (using travelling wave technology built into the smart device) thus allowing proactive repair of the fault.

How it is delivering benefits:

The Bidoyng smart fuse is a key enabling technology. It is being used as the main technology deployed on faulty parts of the LV network as part of the Fault Support Centre. In addition, it is providing information on the performance of the network to facilitate the application of the Connect & Manage approach to domestic PV clusters connected to the LV network.

Over the last two years there has been a further roll out of Weezap smart fuses. These devices have the capacity for five auto-recloses, whereas the Bidoyng has the capacity for only two. The further recloses offered by the Weezap saves additional subsequent customer interruptions while providing us with further information regarding the fault location enabled through the monitoring service managed by the FSC.

Connection and Management of PV Clusters

What the solution is:

As a result of the learning outcomes of the LCN Fund Tier 1 Project – Low Voltage Network Solutions (LVNS), we have been able to successfully implement a streamlined approach to the connection of domestic scale PV systems to the LV network. These systems are often connected in clusters and can give rise to associated network voltage and thermal issues.

Traditionally, a network operator would undertake detailed and time-consuming network assessments to be performed in advance of allowing the connection to proceed. These assessments are aimed at understanding if the connection could give rise to any of the aforementioned problems. However, as a result of the research that was undertaken as part of the LVNS project and the sophisticated network modelling that underpinned it we have adopted the alternative approach of connecting PV and monitoring the LV network.

We have successfully shown that up to a certain threshold (i.e. percentage of customers with PV systems) it is acceptable to allow the connections to proceed. Once the threshold is met however we will install network monitors to assess, using actual recorded data, if the network requires a further intervention.

How it is being used:

The solution is being actively used across our network. We use this to avoid the often costly and time-consuming network assessments that can accompany generation connections. We have established a business process supported by internal policy that provides for continued monitoring of the PV volumes. Specific actions are triggered when these volumes exceed pre-determined limits and follow up actions are performed as appropriate.

How it is delivering benefits:

The solution delivers benefits to customers in the form of avoided waiting times associated with the connection of PV systems to the LV network. We have also been able to avoid expensive and resource intensive network connection studies, thus reducing internal costs and freeing up resources to concentrate on other parts of our connection services.



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Long & Crawford switchgear modification

What the solution is:

The urban parts within the ENWL operating area have HV networks operating predominantly at 6.6kV. A proportion of the switchgear in these areas is fault rated at 13.1kA below our design standard of 21.9kA. Although the current fault level may not exceed this design rating, the lower rated switchgear often represents a significant barrier for new connections, particularly low carbon technologies (LCTs) and distributed generation (DG).

Type testing undertaken by KEMA of Long & Crawford (L&C) 6.6kV switchgear resulted in an innovative technique which allows the use of enhanced fault ratings following a defined modification on specified L&C switchgear types to be implemented.

How the solution is being used:

Two upgrade kits/procedures were developed by Long Controls Limited of St Helens and included in the test series. Such upgrades extend the short circuit withstand capabilities of J3 Ring Switches and T3GF3 Ring Main Units from 13.1kA at 6.6kV to 20kA at 6.6kV for 3 seconds.

This solution enhances the fault level capability of this lower-rated switchgear from the network to coincide with increased penetration of LCT which may otherwise be constrained or unacceptably delayed.

How the solution is delivering benefits:

L&C 6.6kV switchgear represents 31% of ENWL's total switching assets, which shows the prevalence of L & C switchgear and the prioritisation of these sites to achieve maximum impact in alleviating these fault level constraints.



Smart Street Innovation Roll-Out

What the solution is:

The full solution is designed to reduce customer bills by reducing the total amount of energy consumed when supplied to customers. This involves reducing the energy consumed in losses in the ENWL network by reducing energy distributed to customers and by meshing the LV network; reduced carbon emissions flow as a result of these energy reductions and capacity released to connect new LCT technologies by improving control of the LV network.

The Innovation Roll-out Mechanism project (18 October 2019 award from Ofgem) focusses on areas of high fuel poverty to deliver benefits to those most in need. In those targeted areas it will replace 180 distribution fix tap transformers with on load tap changing (OLTC) equivalents and by using LV fuse way circuit breakers (LVCB) and link box switches enable the LV network supplied from these sites to be meshed with adjacent LV networks.

All these new devices will ultimately be autonomously controlled by our central Network Management System (NMS), periodically optimising the network configuration for maximum benefit.

How the solution is being used:

When all technology elements are complete it will operate autonomously in the background, unless operational activity curtail its operation for safety reasons. The equipment is remotely operated by connection to the central NMS and the autonomous software takes control of the remote operation to deliver the full benefits described in the Innovation Roll-out Mechanism (IRM) bid submission.

Each OLTC transformer is being recorded as a distribution transformer (additional detail is captured in ENWL Asset systems). The LVCB are single phase devices, with three required for each LV way/Feeder. Each single-phase unit is being counted as an individual LVCB. No LV linkbox switches have yet to be installed.

How the solution is delivering benefits:

The project will deliver the benefits as described out above, however, these will not be realised until all counterparts of the solution are installed at each site. The IRM bid outlined anticipated saving and methodology for the complete solution which has yet to be implemented.

Note: The savings, against previous operational practise, will vary every time the optimisation model is run and the network re configured.

Further details of our strategy can be found in our Network Innovation Allowance annual summary report which can be found on the following link:

<https://www.enwl.co.uk/globalassets/innovation/nia/nia-reports-and-literature/nia-annual-summary-report-2022.pdf>

3.3 Roll-Out of Smart Grids and Innovation into Business as Usual

All our innovative solutions are designed, implemented and monitored through a set process shown in figure 1 below;

Figure 1: Innovation Lifecycle



The cost and benefit analyses for our innovative solutions are included in the appendices.

3.3.1 Transfer to Business as Usual (BAU)

Managing the transition of an innovative solution, device, technology or new operating arrangement into BAU is perhaps the most important stage in delivering benefits to customers. This phase generally represents the final stage of a project's timeline and is the culmination of its successful outcome.

The ability to transition the innovation to BAU is an important consideration when innovation investment opportunities are assessed. We recognise that some projects are aimed at informing our understanding and learning and in such instances BAU transition

normally involves updates to business processes, procedures and specifications. The BAU assessment also considers the technology risk, the development timeline and our ability to support the developers in a meaningful manner before embarking on a project.

To ensure the successful transition to BAU, we select innovation investments that are assessed as having a good chance of delivering value for customers. We focus on challenges that have been identified in our business plan and use innovation to address these issues. We use a cost benefit analysis approach to ensure that best value projects are taken forward.

We have developed a five-stage initiative tracking process which enables us to take innovation and other business initiatives into BAU.

Figure 2: Innovative Solutions Transfer to Business as Usual



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3.3.2 Smart Metering

Energy supply companies (Suppliers) are responsible for the roll-out of smart meters. We support this process and are working to maximise the benefits from the data they provide.

Our strategy is to: identify, assess and implement processes to use smart meter data; help customers and work in collaboration with Suppliers by upgrading our service positions where necessary to accommodate a smart meter; and actively participate in various industry groups aimed at making the roll out as smooth and efficient as possible.

There are now 1,261,847² smart electricity meters installed in our distribution service area. The majority (65%) of these are an early, SMETS1, version of smart meter with the remainder being the latest SMETS2 meter.

The main difference between the two types of electricity meter is that a SMETS2 provides us with proactive notification of a customer losing their electricity supply (a power outage alert) whereas a SMETS1 does not. Otherwise, they have very similar functionality.

A meter needs to be enrolled by the Data Communications Company (DCC) before we can communicate with it. We are now able to communicate with 915,048³ smart meters which captures about 38% of our customers.

Connection to the DCC's system allows us to access smart meter data which is generally in the form of:

- proactive alerts, such as power outage and restoration notifications, sent to us by the meter; and
- service requests, made by us, to confirm if there is power to a meter or to read information about network utilisation.

Benefits from the use of this non-elective data, which is procured as part of the Smart Meter Communication Licensee Costs, will enable us to manage our network more effectively and cost efficiently for our customers. We have assessed that the benefits of half hour consumption data (which provides an indication of network utilisation) will start to be attained once a DCC enrolment level of at least 70% is reached. There may be some geographic clustering which delivers benefits earlier.

Access to household electricity consumption data from smart meters for a period of less than one month is permitted because Ofgem has approved our Data Privacy Plan⁴.

The growth in the volume of smart meters in our area that we can communicate with such that they now provide actual data for us to develop and refine our management systems. There are several common industry issues (relating to both smart meter device and DCC functionality) which have the potential to negatively impact medium term benefits realisation. Issues cover areas such as: timely and reliable delivery of alerts; false positive alert notifications; nuisance alerts; incorrect/inconsistent meter functionality; and timely and reliable delivery of service requests with a large return data payload (such as consumption data). We are working with industry parties to address these.

We are moving forward with systems integration and business transformation plans that will allow us to take advantage of the benefits from being able to access smart meter data⁵.

Throughout the year we have continued to play an active role at industry level. This includes working with the Energy Networks Association (ENA) Smart Metering Operations Group and its sub-group looking specifically at the safety aspects of the roll-out; and the ENA Service Termination Issues Group supporting Suppliers in their roll out of smart meters.

In 2021/22 we incurred:

- £2.5m in Smart Meter Communication Licensee Costs. Each DNO must contribute towards the cost of the DCC which provides the communication network between electricity meters and industry stakeholders who need it. They are payable by us to the DCC, as required by the Smart Energy Code, and defined by DCC's published charging methodology statement. The costs have decreased by £0.5m compared to last year.
- £860k in IT costs. This is for: the continued support and maintenance of the gateway infrastructure connecting our IT systems to the DCC central system as required by the Smart Energy Code; additional design work required for maintenance of systems to be compatible with the DCC User Interface Specification (DUIS); and integration of smart meter data with our systems and processes. The costs have decreased since last year by £130k as there has not been the same requirement for infrastructure build activities as the previous period.

The data relating to smart meter readiness expenditure can be found in worksheet E5 of the Environment and Innovation Reporting Pack and in section E5 of the Environment and Innovation Commentary in the appendices.



² At end August 2022. ³ At end August 2022. ⁴ [enw-dpp-v5.0-redacted-v2.pdf \(enwl.co.uk\)](#) ⁵ [Smart Meter Info \(enwl.co.uk\)](#)

These documents can be found on the following link:

<https://www.enwl.co.uk/about-us/regulatory-information/environment-report/>

Regulatory Reporting Pack and Commentary:

- 2021-22 Environment and Innovation Reporting Pack
- 2021-22 Environment and Innovation Commentary

Cost Benefit Analyses (Losses):

- 2022 Install 300sqmm HV Cable versus 185sqmm HV
- 2022 Install 300sqmm LV Cable Versus 185sqmm LV
- 2022 Proactive 1000kVA GMT Replacement CV21
- 2022 Programme 23MVA Replacement
- 2022 CBA for E4 Theft of Electricity

Cost Benefit Analyses (Innovation):

- Demand Side Response FY22 RIIO ED1 CBA v1.0
- LV fault management FY22 RIIO ED1 CBA v1.0
- PV Connect & Manage FY22 RIIO ED1 CBA V1.0
- TX Regen CBA FY22 RIIO ED1_v1.0
- Long Crawford FY22 RIIO ED1 CBA V1.0
- Smart Street IRM FY22 RIIO ED1 V1.0

Glossary of Abbreviations

Abbreviation	Meaning
AONB	Area of Outstanding Natural Beauty
CBA	Cost Benefit Analysis
CEG	Customer Engagement Group
CLO	Carbon Literate Organisation
CSR	Corporate Social Responsibility
DCC	Data Communications Company
DSO	Distribution System Operator
DSR	Demand Side Response
EV	Electric Vehicle
FSC	Fault Support Centre
HV	High Voltage
kVA	Kilo Volt Ampere (unit of power)
LV	Low Voltage
NIA	Network Innovation Allowance
NIC	Network Innovation Competition
SAP	Sustainability Advisory Panel
SF ₆	Sulphur Hexafluoride
tCO ₂	Tonnes Carbon Dioxide
TOS	Transforming Our Spaces



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