# Environment Report

2023-2024

electricity north west


GOODS WAREHOUSE

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# 1. Executive Summary

**Electricity North West Limited is 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 determined to play our part in enabling the UK's transition to a Net Zero carbon future and the environmental benefits that this will bring. This desire influences both our asset investment plans and the investments we make in measures to reduce our own carbon footprint.

## 1.1 Purpose of the Report

It is important to us that customers and other stakeholders have a clear understanding of how we endeavour to minimise any adverse impact that 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 details on the progress we have made in the first year of the RIIO-ED2 period (this is the price control period set by Ofgem from 2023-2028) in terms of our overall strategic environmental objectives and meeting the environmental targets we set out in our RIIO-ED2 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 in to how we are creating a low carbon network, by developing the technology and systems, and preserving biodiversity and ecosystems by driving down our carbon emissions.

To reflect our environmental aims, we encapsulated our ambition in our Environmental Action Plan for RIIO-ED2. Delivery is tracked against 21 goals with seven focussed on our Net Zero ambition and 14 on wider environmental aspects. Table 1 on the following page sets out these goals and provides a summary of progress against those commitments in 2023/24.

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.

Table 1: Environmental Action Plan goals and progress in 2023/24

| Delivery Programme | EAP Goal No. | EAP Action Plan Goals | Expected Benefit/key milestones | FY24 | ED2 target |
|---|---|---|---|---|---|
| Carbon emissions | 1 | Become a leader in the reduction of carbon emissions and achieve Net Zero by 2038 | Decarbonisation road map has been developed combining Science-based target reduction of 63% by 2035 and Net Zero ambition by 2038 | G | G |
| | 2 | Adopt Science-based targets to help limit global warming to 1.5 degrees C above pre-industrial levels | Science-based target validated using baseline data from 2019/20 | G | G |
| | 3 | Take responsibility for our major supplier's scope 3 emissions and include them in our Science-based targets | Included in recalibrated Science-based targets and will continue to be monitored on monthly basis | G | G |
| | 4 | Manage our electricity distribution losses and achieve reductions of 8GWh per year throughout RIIO-ED2 | Low loss replacement transformer programme is on track for reduction target | G | G |
| Network investment | 5 | Maintain a leakage rate of less than 0.35 % of our total bank of sulphur hexafluoride equipment | Sulphur hexafluoride management plan has been developed and losses limit will be reviewed in March 2025 | G | G |
| | 6 | Baseline the embodied carbon within new projects by the end of 2023/24 and set reduction targets | Major projects have been baselined for embodied carbon for 2023/24, with approach shared with suppliers to increase performance | G | G |
| | 15 | Maintain a leakage rate of less than 25,000 litres per year of oil | Programme developed to track and improve response time to oil leakage from fluid filled cables to minimise environmental impact, this limit will be reviewed in March 2025 | G | G |
| | 16 | Remove overhead lines from national parks and areas of outstanding natural beauty | Overhead lines asset replacement plan in place with stakeholder engagement ongoing | G | G |
| Operational response | 17 | Take action to reduce noise pollution | Continue to work with our customers to reduce the impact of our operations on local amenity, we are exploring alternative generator options to reduce noise impact | G | G |
| | 18 | Phase out the use of diesel and petrol vehicles which produce emissions of NOx and other air pollutants | This is a key component in our decarbonisation road map with a focus on transition to electric vehicles. Enhanced data will be available from April 2025 to allow decision points to be identified in RIIO-ED2 for vehicle transition | G | G |
| | 19 | Remove equipment contaminated by polychlorinated biphenyls from our network by the end of 2025 | Polychlorinated biphenyls (PCB) transformer replacement programme on track to comply with PCB Regulations by 31 December 2025 | G | G |

Table 1: Environmental Action Plan goals and progress in 2023/24 (cont.)

| Delivery Programme | EAP Goal No. | EAP Action Plan Goals | Expected Benefit/key milestones | FY24 | ED2 target |
|---|---|---|---|---|---|
| Supply chain | 8 | Enhance environmental management standards through our supplier code and target at least 80% of our supply chain to meet this code | We have identified our top 20 supply chain partners to work in a collaborative environment to improve environmental performance, this approach has been reviewed in 2023/24 and has been assessed as amber against target although on track for delivery in RIIO-ED2 | A | G |
| | 9 | To be responsible consumers of resources and reduce the amount of waste produced by the end of RIIO-ED2 | We are working across our supply chain to reduce the impact on resources and embed circular economy principles | G | G |
| | 10 | Divert 95% of our waste away from landfill by the end of 2025 and reuse or recycle 70% of our waste by the end of RIIO-ED2 | A key component of our approach to waste management is to ensure diversion from landfill and to continue to increase our recycling/reuse rates | G | G |
| | 11 | Reuse and recycle at least 85% of waste excavated for installation and repair | We are working across the industry to ensure compliance with Regulatory Position Statement 298, amber status for 2023/24 reflects the work being done across the utility sector on how to comply with guidance and we have been actively involved in trials for sampling of excavated waste | A | G |
| | 12 | To be responsible consumers of water and reduce the water consumption per colleague during RIIO-ED2 | This forms parts of our wider decarbonisation plans as we continue to reduce our consumption from our estate | G | G |
| Biodiversity | 13 | Adopt an appropriate tool to assess changes in natural capital from different options for network projects | Natural capital tool developed and in use for biodiversity programme to baseline our estate and track biodiversity enhancements | G | G |
| | 14 | Enhance biodiversity and natural capital across 100 sites during RIIO-ED2 and plant 10,000 trees per year | 100 sites, predominantly substations identified and being actively managed to improve biodiversity and 11,000 trees planted in 2023/24 | G | G |
| Training | 7 | Achieve the Carbon Literacy gold standard | We continue to work towards gold standard by the end of RIIO-ED2, focus for 2023/24 has been on delivery to office-based teams. Currently at amber due to review of training to ensure fit for delivery for our operational teams | A | G |
| | 20 | Train more colleagues on the requirements of our Environmental Permits for oil recycling through a CMS to reduce risks of environmental harm | Programme developed to identify key areas for training development and on track for delivery in RIIO-ED2 | A | G |
| | 21 | Provide training to our wider leadership team to enhance environmental awareness | Environment and sustainability communications plan developed to target training, supported with awareness bulletins | G | G |

## 1.2 Our Business/Who We Are

We operate an electricity distribution network delivering power to five million people with 13,000km of overhead lines, over 47,000km of underground cables, almost 84,000 items of switchgear and more than 35,000 transformers. We do this through a workforce of more than 2,000 people, a large contractor workforce, a fleet of over 1,000 commercial vehicles, trailers and items of mobile plant, and 16 depot and office sites. Consequently, our activities create risks, impacts and opportunities with regards 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 constituent of polychlorinated biphenyls), waste management, vehicle emissions, holdings of sulphur hexafluoride gas ($SF_6$) 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 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 some of 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 to protect and improve the environment we operate in, including;

- Ensuring environmental planning is considered through all our design, planning and construction phases;
- Reduction of our carbon footprint;
- Protecting areas of outstanding natural beauty;
- Continuing to improve distribution losses;
- Reduce $SF_6$ emissions and oil leaks; and
- Using innovation and stakeholder engagement to reduce our environmental impact.


## 1.3 How we manage our environmental and energy performance

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 improve the environment that we operate in.

We will:

- Implement and maintain a robust environmental management system that is certified to ISO 14001 (the international standard for environmental management systems) and an energy management system, which is certified to ISO 50001 (the international standard for energy management);
- Identify the environmental and energy-using aspects associated with our activities, looking for opportunities to reduce energy usage and implementing solutions to improve our performance;
- 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 priority in the selection of suppliers of goods and services;
- 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 regarding environmental and energy management performance.

# 1. Executive Summary

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

- Management of identified environmental risks and opportunities;
- A clear understanding and visibility throughout the business of environmental aspects 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.

## 1.4 Role of Stakeholders in Environmental Management

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

Working in partnership with a range of other stakeholders, including national and local government, utilities, charities, community energy, suppliers and regulators, 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.

Read more about how we are making the North West's electricity network ready for a future with less carbon here: future energy (enwl.co.uk)

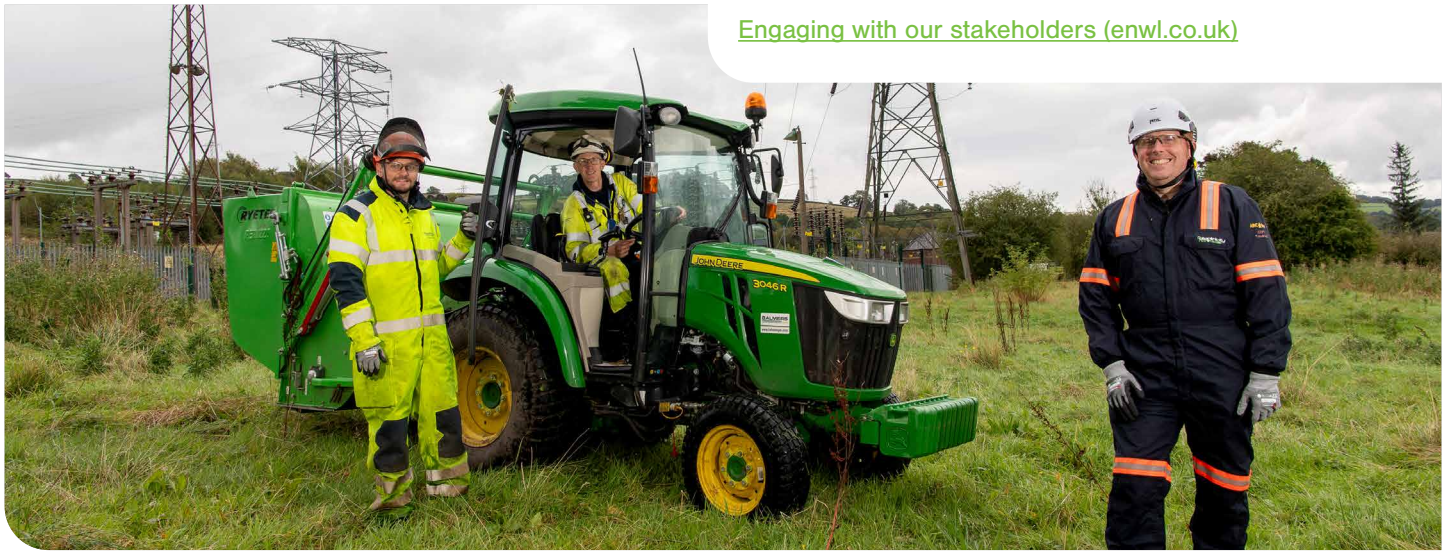
As part of our leading the North West to Zero Carbon plan we have increased engagement with our employees with regards to their opportunities for supporting the transition to Net Zero and are proud to have been the first DNO to be awarded the Silver Carbon Literacy standard. We are working towards Gold certification and will achieve this by 2028.

As part of our leading the North West to Zero Carbon plan we have increased engagement with our employees with regards to 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 are working towards Gold certification and will achieve this by 2028.

We meet regularly with our regional partners, including the Greater Manchester Combined Authority, Lancashire County Council, Cumberland Council and Westmorland and Furness Council, and representatives of Protected Landscapes (National Parks and National Landscapes) to discuss visual amenity in designated areas. Through this process our stakeholders play a key role in shaping our environmental strategy and investment priorities.

Details of our stakeholder engagement practices and how customers and stakeholders can get involved can be found via the following link:

Engaging with our stakeholders (enwl.co.uk)



**We have committed to minimise the carbon footprint of our business and actively contribute to the transition to a zero carbon economy. Our carbon footprint is a measure of the impact our business has on the environment through our emissions of greenhouse gases.**

Our carbon footprint is aligned to the Science-based target initiative for 2024/25 reporting onwards. We aim to reduce our carbon emissions by 63% by 2035, relative to a 2019/20 baseline.

In 2023/24, 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 way 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.

We've installed a new solar-powered car charging port at our Training Academy, making it our first Net Zero site. The solar system will generate (175.5 kWp, ~150,000 kWh), including a roof-mounted and car port solar system. This will offset the annual energy consumption at the Training Academy, making it a Net Zero site. This is a significant step towards achieving Net Zero, as our buildings account for 26% of our GHG emissions.

This innovative project will serve as a blueprint for future projects, helping us fulfil our ambition to be Net Zero by 2038. Our Science-based target trajectory to 2035 is based on action driven changes to reduce our emissions, beyond 2035 we will be able to consider carbon offsetting to meet our 2038 Net Zero target.

Our scope 1 and 2 emissions totalled 8,900 $tCO_2e$ against a target of 8,619 $tCO_2e$. The $tCO_2e$ contribution from mobile generators was mostly offset by our improved performance for electricity in our buildings, meaning that our business carbon footprint including scope 3 emissions (which totalled 5,099 $tCO_2e$ for 2023/24) was 13,999 $tCO_2e$, an increase of 9 $tCO_2e$ on the previous year. This increase was in part due to the impact of storms in the winter of 2023/24, which meant that more mobile generators needed to be deployed to keep our customers on supply. To better cope with the impact of climate change we are pursuing alternative strategies for managing our generators to include full electric, where practicable, hybrid and biofuel options to reduce the environmental impact of maintaining power supply for our customers.

Our carbon footprint is aligned to the Science-based target initiative for 2024/25 reporting onwards. We aim to reduce our carbon emissions by 63% by 2035, relative to a 2019/20 baseline.

Our approach to scope 3 emissions is focused on increasing the number of GHG emission indicators we monitor, whilst enhancing the data quality to further support reductions. As part of our SBTi commitment, fuel and energy related activities and commuting will be tracked as part of our GHG emissions going forward. Environmental Action Plan goal 8, aims to enhance environmental management standards through our supplier code and target at least 80% of our supply chain to comply. As part of this process, we are developing our environmental and energy management standards with our supply chain, supported by the Supply Chain Sustainability School. We are also developing the next phase of our Carbon Literacy programme to collaborate with our suppliers.

# 2. Business Carbon Footprint

Table 2: Business Carbon Footprint detail

| Business Carbon Footprint | 2024 $tCO_2e$ | 2023 $tCO_2e$ |
|---|---|---|
| **Scope 1** | | |
| Operational transport | 4,448 | 4,299 |
| Fugitive emissions | 663 | 888 |
| Fuel combustion | 159 | 44 |
| **SCOPE 1 TOTAL** | **5,270** | **5,232** |
| **Scope 2** | | |
| Buildings energy usage | 3,630 | 3,384 |
| **SCOPE 2 TOTAL** | **3,630** | **3,384** |
| **Scope 3** | | |
| Business transport – rail | 7 | 5 |
| Business transport – air | 37 | 14 |
| Business transport - road | 589 | 733 |
| Contractor operational transport - road | 1,578 | 2,049 |
| Fuel Combustion - Diesel for Generators | 2,888 | 2,574 |
| **SCOPE 3 TOTAL** | **5,099** | **5,374** |
| **Business Carbon Footprint (excl. losses)** | **13,999** | **13,990** |
| Electrical losses[1] | 304,724 | 242,882 |
| **Business Carbon Footprint (incl. losses)** | **318,723** | **256,872** |

[1] The reported electrical losses figure is a snapshot of received data as of the date of this report and will change as further settlement reconciliation runs are carried out (up to 28 months after each relevant settlement date).

# 3. Sulphur Hexafluoride ($SF_6$) & Other Insulation and Interruption Gases (IIG)

**$SF_6$ is a gas with excellent electrical insulation and other properties, which have led to its widespread use in electrical switchgear and in several other industrial applications. In recent years, there has been growing concern over any $SF_6$ that releases into the atmosphere because of its identification as a potent greenhouse gas. It has been highlighted that $SF_6$ is 23,500 times more potent than $CO_2$ as a greenhouse gas.**

In terms of our strategy to address the risk associated with $SF_6$, we contribute to the overall UK electricity transmission and distribution industry in supporting Government initiatives to ensure the implementation of robust policies for the control and use of $SF_6$. 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 $SF_6$ equipment with low leakage rates and leakage monitoring systems. Over the RIIO-ED2 period we plan to maintain a leakage rate of <0.35% to 2028, with a review of how we are tracking against the target planned for the end of 2024/25.

We have a total of 16,264kg of $SF_6$ inside 10,434 assets. By weight, more than half of the $SF_6$ on our network is in 132kV assets. As we highlighted in our Environmental Action Plan, our $SF_6$ holding has increased compared to the previous year, due to new 6.6/11kV being switchgear installed. However, this new switchgear is less likely to leak than older systems.

In 2023/24 we removed 35.56kg of $SF_6$ but added 312.23kg due to new installations, resulting in a net gain of 276.67kg compared to the previous year. Our $SF_6$ leakage for the year was 28.23kg, with 6.6/11kV assets contributing 63% of this total. The leakage rate is 0.17% total $SF_6$ bank and this is within our annual leakage limit rate of 0.35%. This includes top ups and losses assessed from recovered gas from decommissioned plant.

We have engaged a specialist contractor who collects $SF_6$ containing gear removed from the network, recovers and safely disposes the $SF_6$ gas in an environmentally friendly way.

We have continued to replace $SF_6$ equipment and proactively manage our equipment to minimise leaks.

We have one 132kV circuit breaker containing 4.94kg of g3 gas (C4FN gas) on our network. The pure C4FN gas has a GWP of 419. There has been zero leakage of this gas. This one circuit was a trial to ascertain the cost effectiveness of this as a non-$SF_6$ alternative.

Our annual target leakage rate has remained at the RIIO-ED1 rate of <0.35% whilst we develop and embed our $SF_6$ strategy. We will review our target at the end of March 2025, and are considering converting to a target on based on mass (kilograms) – this was based on a suggestion from our Environment and Sustainability Panel. Reviewing our leakage rate at the mid-point of RIIO-ED2 provides an opportunity to assess technological advances, impact of regulatory changes and take account of current performance.

For 132kV switchgear, our strategy is to use non-$SF_6$ technologies for all joint sites as it aligns with National Grid Electricity Transmission's (NGET) strategy. We have trialled a live tank 145kV circuit breaker with a C4FN gas and we plan to replace two more circuit breakers with the this same type during this regulatory period.

The UK currently complies with The Fluorinated Greenhouse Gas Regulations 2015 which governs the use of F-Gases in equipment such as fridges, freezers, air conditioning units and electrical switchgear. Throughout 2023 the EU has been revising the F-Gas Regulations and in February 2024 adopted the final version of the regulations which were applied on the 11 March 2024. The regulations are now in force in EU law, but this law does not automatically flow through to UK law as UK law dates the 2015 version of the regulations. It is expected that the UK government will follow the EU law.

The table below shows the EU regulations ban dates by voltage level for the use of new $SF_6$ filled equipment (putting into service) – in chronological order.

### Table 3: EU regulatory $SF_6$ proposed ban dates

| Network – Voltage level | $SF_6$ Ban Date |
|---|---|
| Distribution (6.6/11kV) | 1st January 2026 |
| 145kV | 1st January 2028 |
| 33kV | 1st January 2030 |

New equipment containing $SF_6$ fluorinated gas alternatives (such as C4FN) are allowed providing that the cost of carbon is less than a product that uses a F-Gas free alternative.

We chair the Energy Networks Association's (ENA) $SF_6$ Working Group and are an active member in commenting on proposals and trying to influence the outcome. We have been working with all suppliers on their transition to $SF_6$ alternatives.

For existing equipment in service, all maintenance will have to use reclaimed $SF_6$ from 2035. Existing equipment can be extended with an $SF_6$ filled product should it be still in manufacture. Records of top ups and extensions need to be retained for five years for inspection if requested by UK regulators.

We are developing our $SF_6$ strategy considering these regulatory developments.

# 4. Electricity Distribution Losses

**When electricity is generated, not all 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 related to measurement and billing issues ('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 are reported. This movement in losses is reflected in the total losses associated with our network.

In 2023/24 losses[2] were 1,471,571,933kWh or the equivalent of 304,724 $tCO_2e$. This was an increase of 64,908,621kWh from 2022/23 which, together with a change in the UK government electricity conversion factor, equated to an equivalent increase of 32,703 $tCO_2e$.

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 are reported. This movement in losses is reflected in the total losses associated with our network.

We 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-ED2 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-ED2.

As part of this strategy, we are implementing several priorities for reducing both technical and non-technical losses summarised in Table 4 on the following page.

[2] It should be noted that the reported losses figure is a snapshot of received data as of the date of the 2023/24 RRP submission and will change as further settlement reconciliation runs are carried out (up to 28 months after each relevant settlement date).

Table 4: 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 |
| | 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: electrical losses (enwl.co.uk)

# 4. Electricity Distribution Losses

Table 5: Summary of Losses Costs and Benefits from Activities in RIIO-ED2

| Programme/ project title | Regulatory Reporting Year 2023/24 | | | RIIO-ED2 |
|---|---|---|---|---|
| | Distribution Losses – Justified Costs | Reduced Losses | Reduced Emissions Associated with Losses | Cumulative reduced losses to date |
| | £m | GWh | $tCO_2e$ | GWh |
| Standardise use of 300mm² HV cable | 1.1 | 6.31 | 1,443 | 6.31 |
| Standardise use of 300mm² LV cable | 0.9 | 3.99 | 913 | 3.99 |
| Proactive replacement of pre-1990 1000kVA transformers | 0.7 | 0.35 | 79.55 | 0.35 |
| Opportunistic primary transformer replacement | 0.1 | 0.04 | 9.54 | 0.04 |
| Relevant theft of electricity action | 0.1 | 1.6 | 363.16 | 1.6 |
| **Total** | **2.9** | **12.29** | **2,808** | **12.29** |

Table 6: Summary of Losses Activity in 2022/23

| Programme / project title | Description of unit | Volumes in 2023/24 |
|---|---|---|
| Standardise use of 300mm² HV cable | km of cable | 137 |
| Standardise use of 300mm² LV cable | km of cable | 54 |
| Proactive replacement of pre-1990 1000kVA transformers | Transformers | 22 |
| Opportunistic primary transformer replacement | Transformers | 3 |
| Relevant theft of electricity | Theft cases identified | 550 |

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.

**Embodied carbon relates to the amount of emissions associated with materials and construction throughout the whole lifecycle of an infrastructure project.**

1 In line with our Environmental Action Plan we are reporting on the embodied carbon values for Major Projects completed in 2023/24. The report details embodied carbon for components of the project that contribute to greater than 1% of total for that project.

2 The embodied carbon values per project are for the Design Stage using estimated quantities, volumes, weights and typical embodied carbon factors. As our RIIO-ED2 contracts and frameworks are being renewed, we are including the requirement for the contractor to provide 'As Manufactured' and 'As Built' embodied carbon reporting. Our experience is that larger manufacturers and contractors are already reporting on embodied carbon for other companies and are knowledgeable with embodied carbon reporting. However smaller companies, especially local civil companies, are less knowledgeable and their first experience with embodied carbon reporting will be on ENWL projects.

3 Manufacturer / supplier embodied carbon factors are used if they are available and have been supplied to ENWL. If not available, factors are based on the Inventory of Carbon and Energy (ICE) for materials and civil items. Electrical items values are based on NGED's ALPACA project values where applicable or the Inventory of Carbon and Energy values for individual material types.

4 For cable laying projects, a standard make up for trench profiles per road type has been used. Profile depths are as follows:

Type 1&2 - 100mm (Tarmac layer), 180mm (Concrete layer), 210mm (MOT Sub base stone), 210mm (Backfill layer) and 200mm (Sand layer).

Type 3&4 – 100mm (Tarmac layer), 50mm (Concrete layer), 275mm (MOT Sub base stone), 275mm (Backfill layer) and 200mm (Sand Layer.)

5 The embodied carbon reports are for Cradle to Practical Completion (modules A1 to A5).

6 For the transport to site module (A4) assumptions are made on the source being Local, National, European or Global. The factors used are based on the factors published by Institution of Structural Engineers and UK Government GHG Conversion Factors for Company Reporting.

7 The construction phase (A5) is broken down into actual construction (A5a) and construction waste (A5w). For Civil Construction the embodied carbon values are based on estimated cost of the works. Waste is based on physical weight of material quantities. The factors for converting these values to A5 and A5W are based on the factors published by Institution of Structural Engineers. Waste covers any material removed from site for disposal.

8 ENWL are trialling new low embodied carbon products such as Eco Cement and building components such as roof tiles. We will continue to trial products, where applicable, in preparation of our embodied carbon reductions plans which will be published later in RIIO-ED2.

# 6. Supply Chain Management

**We have published our supply chain charter to provide supply chain partners with an understanding of our expectations regarding responsible supply chain practices. The charter is subject to annual review. We set high standards for our suppliers, particularly concerning compliance with our strict health and safety, quality, ethical standards (modern slavery and real living wage), environmental capabilities, diversity and inclusion strategy. All these areas are carried out in conjunction with our responsibility frameworks.**

We aim for all our suppliers to be registered with the Achilles' Utility Vendor Database which is the utility industry pre-qualification system used across the UK. We use the system for most of our procurement exercises, working closely with key buying organisations in the sector, this community helps utilities achieve the highest standards of supply chain assurance.

Our framework tender process has developed around our responsible business process from incorporating key environmental and Modern Slavery requirements to Real Living Wage and diversity and inclusion. As the business embraces and expands environmental reporting from Scope 1 and 2 to incorporate Scope 3 emissions, we know that there will be more to be done with our supply chain partners. To ensure we influence the wider value chain and to reduce associated emissions, we have used credible knowledge experts to help ascertain the emission hotspots in our supply chain. It is apparent that our scope 3 emissions do not cross the threshold for automatic inclusion in our Science-based targets process, however we have included them based on our ambition to be a leader for Net Zero in the North West.

We have put forward a proposal to conduct Carbon Literacy training for all tier 1 suppliers, contractors and customer partners. We also asked our contractors to complete our 'Switched on to Vulnerability' training that looks to understand vulnerability, giving them the skill and knowledge to enable them to spot the signs of vulnerability and take appropriate action.

**Our commitment is to minimise waste at every stage of our operations whilst implementing innovative solutions and sustainable practices that reduce our environmental footprint.**

## What we achieved

We generate waste from a range of our activities and sources, including office and depot activities, asset replacement and network maintenance. This includes anything from paper, plastic, metal, oil or hazardous materials. It is our responsibility to recycle and dispose of this waste responsibly.

We are committed to achieving zero waste to landfill, which aligns with goal 10 of our EAP. This year, our total waste amounted to 1,356 tonnes and we successfully diverted 96% of it away from landfill. The full breakdown of waste is provided below:

| Waste breakdown | |
|---|---|
| Hazardous waste | 137 tonnes |
| Recycled waste | 295 tonnes |
| Non-recycled waste | 924 tonnes |
| Total | 1,356 tonnes |

## 7.1 Circular economy opportunities

Our Central Oil Reprocessing Department (CORD) remains the only one of a kind in our industry. We take used, dirty oil from our network and assets and reprocess it into clean oil and are then able to reuse it on our network. This has many benefits, the main one being that we can reduce the amount of virgin oil that is needed on the network as we recover 81% of the oil we process to be put back into the network. Another significant benefit is that we reduce the maintenance requirements on our assets, prolonging the life of assets that reduces the financial impact on our customers but reduces our requirement to replace assets that still have operational value.

New oil currently costs around £1.80 per litre compared to approximately £0.86 per litre for our reprocessed oil.

As part of our focus to reduce single use plastics in our business, we have implemented 'Our buckets for life' programme. We continue to collaborate with our suppliers to explore alternative approaches to reduce our environmental impact.

New oil currently costs around £1.80 per litre compared to approximately £0.86 per litre for our reprocessed oil.

# 8. Visual Amenity

**There are three National Parks and four National Landscapes, collectively known as Designated Areas, either wholly or partially within our region. These are:**

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

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 RIIO-ED2, we are continuing our undergrounding programme and were pleased to secure funding for its continuation in the RIIO-ED2 Final Determination from Ofgem.

Table 7 gives details of the schemes completed in 2023/24 and Table 8 shows the projects planned for completion in 2024/25.

Table 7: Visual Amenity Planned Projects Completed 2023/24

| Designated Area | Scheme Delivery 2023/24 | Overhead Line to be Removed (km) | Underground Cable to be Installed (km) | Total Expenditure (£k) |
|---|---|---|---|---|
| Arnside & Silverdale | UVA Warton-Barrow Scout | 0 | 0 | 5.6 |
| Arnside & Silverdale | UVA New Barns Arnside | 0.9 | 1.0 | 233.7 |
| Lake District | UVA Dacre Village South | 0.2 | 0.3 | 66.0 |
| Lake District | UVA Wilton Hill-Far How Mungrisdale | 1.3 | 1.8 | 204.2 |
| Lake District | UVA Aughtertree Calbeck | 0 | 0 | 27.4 |
| Lake District | UVA Meathop - Ulpha Sluice | 0 | 0 | 2.0 |
| Lake District | UVA Thompson Ground Hawkshead Hill | 0 | 0 | 252.5 |
| Lake District | UVA Helsington Church Helsington | 0 | 0 | 21.7 |
| Lake District | UVA Bampton Grange | 0 | 0 | -7 |
| North Pennines | UVA Clesketts - Howgill Hallbankgate | 0 | 0 | -73.9 |
| Solway Coast | UVA North Plains Bowness on Solway | 1.0 | 1.4 | 265.5 |
| | **Total** | **3.4** | **4.5** | **997.7** |

Table 8: Visual Amenity Planned Projects 2024/25

| Designated Area | Scheme Delivery 2024/25 | Overhead Line to be Removed (km) | Underground Cable to be Installed (km) | Total Expenditure (£k) |
|---|---|---|---|---|
| Lake District | UVA Meathop - Ulpha Sluice | 1.4 | 1.4 | 293.2 |
| Lake District | UVA Thompson Ground Hawkshead Hill | 0.0 | 0.2 | 0.02 |
| | **Total** | **1.4** | **1.6** | **293.2** |

# 9. Noise Pollution

**We received 25 noise-related complaints in 2023/24 compared to 29 in the previous year. The complaints in the year were related to substation noises which were dealt with through our customer service processes.**

Most complaints relate to noise from generators, which are being used to maintain power supply to our customers. We investigate any complaints and look to rectify the situation as soon as we can which may include using different types of hybrid generator options that reduce operational noise.

# 10. Polychlorinated biphenyls (PCBs)

**Polychlorinated biphenyls (PCBs) are a group of artificially manufactured organic chemicals that have long been recognised as posing a threat to the environment due to their toxicity, persistence and tendency to bioaccumulate. We (and our predecessor companies) never sourced PCB-filled transformers but some contamination could, and has, occurred due to cross contamination in the manufacturing process. Generally, PCBs were used in electrical equipment as an alternative insulating fluid where fire resistance properties were required. Although the use of PCBs has been reduced since the 1970s when legislation first sought to control their use and supply, it is recognised that PCBs in existing equipment pose a threat to the environment.**

All transformers (and some other network assets) manufactured before 1987 are assumed to be potentially PCB-contaminated and are registered annually with the Environment Agency. We are working with the Environment Agency to either test or statistically determine the PCB content of all this apparatus and dispose of items that are PCB contaminated by 31 December 2025 (as legislation requires PCB-contaminated equipment to be removed by this date). We recycle insulating oil from our network at our oil recycling facility in Blackburn. Prior to receiving oil from our network assets, the oil is tested in our own laboratory to establish its suitability for reprocessing. This looks at several parameters, including its PCB concentration. Although legislation allows for PCB concentrations of up to 50ppm, if our testing shows PCB concentration to be above 10ppm, the oil is not reprocessed to avoid the build-up of PCBs in our oil stocks.

## Our RIIO-ED2 action plan for PCBs

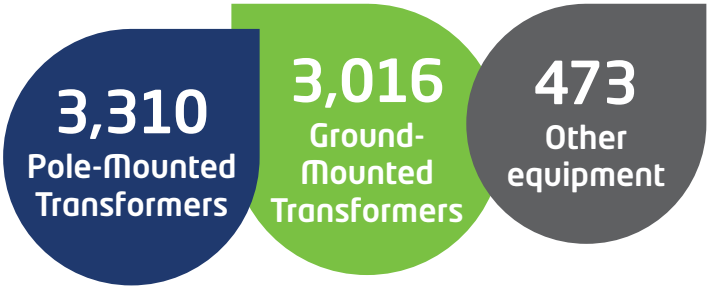
Following testing of insulating oil from a network asset, if the PCB concentration is above 50ppm, the equipment will be replaced and the PCB-contaminated oil disposed of via high temperature incineration which destroys the chemicals. All PCB-contaminated equipment will be sent to authorised treatment facilities where the oil will be recovered and the metal components sent for recycling.

As testing of assets to determine the PCB contamination status can be difficult, specifically for Pole-Mounted Transformers (PMTs), which are not normally included in routine oil sampling a statistical approach to identify potentially contaminated PMTs has been developed in conjunction with the Energy Networks Association (ENA) and accepted by the Environment Agency to comply with Regulatory Position Statement 246. This means that cohorts of transformers that have been tested and proven to have PCB contamination below 50ppm can remain in service. This ensures that our customer's money is invested more efficiently as we look to comply with the regulations.

We have a separate testing and remediation regime for testing of Ground-mounted transformers (GMTs) reporting and recording that data on our asset register.

We track progress against our PCB replacement programme and update our asset register on an annual basis as required by the Environment Agency. We are using a testing regime that allows our engineers to test a transformer in-situ and then change the transformer if required.

In our 2024 submission to the Environment Agency we have 6,799 assets that need to be tested or confirmed statistically that they are unlikely to be contaminated with PCBs, comprised of:




The ENA and EA have adopted a National Statistical model referenced above and allows transformers to be classified by potential PCB contamination, the model is available here: PCB Cloud Statistical Model (energynetworks.org)

# 11. Biodiversity and/or Natural Capital

**Helping to tackle the biodiversity emergency is paramount to our environmental ambitions and we have made real progress to enhance the biodiversity of our estate.**

We have taken significant steps forward in developing our understanding about the biodiversity on our estate. This has included the appointment of a Biodiversity Manager to help focus our efforts on increasing our environmental performance.

We have mapped our estate to better understand how we can enhance biodiversity, we have developed a natural capital tool that allows site locations to be assessed and then track progress against our Environmental Action Plan goals for biodiversity:

**Goal 13:** Adopt an appropriate tool to assess changes in natural capital from different options for network projects, and to monitor the provision of ecosystem services

**Goal 14:** Enhance biodiversity and natural capital across 100 sites during RIIO-ED2 and plant 10,000 trees per year

We have started an active management programme on 100 of our network sites to improve biodiversity levels across the North West and planted over 10,000 trees on our estate in partnership with the local community groups. To help us target biodiversity enhancement we developed a Natural Capital Tool that ensured we could baseline the status of our estate. These baselines will be monitored continuously throughout the life of the projects to evaluate the efficacy of the biodiversity management practices, further detail of which are given below in relation to the development of bespoke tools necessary to achieve this.

In March 2024, following an extensive stakeholder consultation period, we entered a long-term partnership with the Cumbria Coastal Community Forest to deliver on our landholdings at Sandsfield Road in Carlisle with the planting of over 10,000 trees. Although challenging, this exciting and novel project accommodated the complexities of on-site overhead and underground infrastructure to produce a unique woodland that contained a mosaic of different planting types that included conventional woodland, scrub, hedgerows, high density and wood pasture. To allow access to tower bases and wayleave corridors on site, a significant proportion of the site was kept as grassland that further served to enhance the overall site habitat diversity. This retained grassland will be restored to a species rich lowland hay meadow by working in close partnership with the Cumbria Wildlife Trust, boosting the Biodiversity Net Gains of the site.

In conjunction with the tree planting at Sandsfield Road, we are well underway with a biodiversity uplift programme that will actively enhance the greenspace habitat of over 100 of our network sites during RIIO-ED2. We are using our in-house operational teams to undertake practical management work that introduces a low intensity grass cutting regime to most of these sites, and, on the remainder, small scale woodland management. The grass cutting replicates traditional hay meadow management to encourage a greater diversity of wildflowers for the benefit of a wide range of pollinating insects. We are carrying out Woodland management to increase the structural diversity of the trees present and increases light levels for woodland floor species. We have so far completed our first management cycle and have seen very encouraging results, with many sites receiving a renewed flush of wildflowers such as orchids that had previously been absent.

To support the biodiversity enhancement projects, the Biodiversity Manager worked in close collaboration from RIIO-ED1 onwards with consultants to commission monitoring and reporting tools to establish pre-management natural capital and biodiversity baselines for all network project sites. These tools are now used to effectively monitor increases in biodiversity levels from baseline across the ENWL estate over the course of RIIO-ED2 as result of ongoing habitat management. Another purpose of the commission was to highlight opportunities within the estate to maximise natural capital and ecosystem service provision, and to identify sites that would benefit from further habitat creation.

We developed a field reporting that allows the biodiversity management teams to undertake live on-site GPS data capture for fauna, flora and habitats, or even the presence of invasive species. It also allows the user to verify if the site enhancement opportunities indicated in the baseline tool are viable.

All the headline figures and reporting data detailed within the Natural Capital and Biodiversity Baseline tool and field reporting application are available to view and summarised within the ENWL ARCGIS Biodiversity Story Map Portal which allows employee access to all the BNG and Natural Capital baseline values for the entire biodiversity site portfolio.

**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, 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 committed in our RIIO-ED2 business plan to maintain a leakage rate of less than 25,000 litres per year by 2028 and to review this target by the end of 2024-25. In 2023/24 a total of 17,545 litres of oil was lost representing 1.8% of the total oil in service.

Our asset management strategy has identified circuits for replacement in both RIIO-ED2 and RIIO-ED3 periods as part of our long term plan to entirely remove this type of cable from our network.

# 13. Wider Environment & Other Activity

## 13.1 External accreditation

This year we have maintained our certifications to internationally recognised standards ISO 45001 (this is an international standard that specifies requirements for an occupational health and safety management system) and ISO 14001 which cover safety and environmental management systems and demonstrate our internal and external commitment to workplace safety and environmental improvement. These standards are certified by a UKAS approved accreditation body.

## 13.2 Helping customers and colleagues

Facilitating our customers' and stakeholders' ambitions towards achieving Net Zero is a key part of our strategy to get to Net Zero in the North West. We have successfully engaged with customers in the following areas:

Funding opportunities, engagement and campaigns

- We are supporting local communities to reduce, manage, generate and purchase their own energy. Community groups and organisations have been given a share of more than £80,000 to help support the region's energy needs through local community schemes. We have awarded more than £500,000 to 39 groups and organisations across the region as part of our 'Powering our communities' fund.
- Our 'Take Charge' campaign provides free impartial advice to help shape customers and colleagues future energy by identifying low carbon options for energy like solar, electric vehicles, heat pumps; and how funding can be accessed through appropriate grant options.

## 13.3 Customer vulnerability

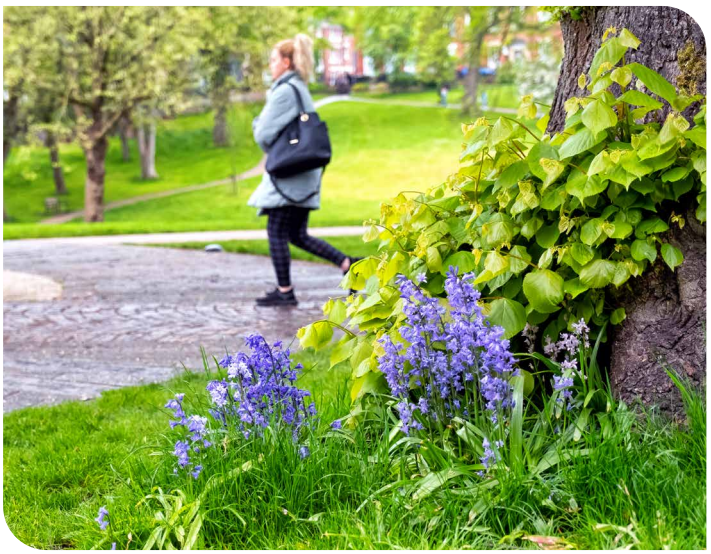
- We are committed to supporting our customers ensuring that our services are available and accessible to all our customers, regardless of their personal circumstances and location, ensuring no one is left behind. We became the leading DNO for fuel poverty support offering free energy saving advice in partnership with Citizens Advice to provide energy and money advice our customers can trust.
- We delivered £8.55 million in benefits to 25,072 customers in just 12 months and achieved a satisfaction rating of 95.3%.
- We have increased awareness of our Extra Care Register to ensure that households have extra help and support during a power cut. We have made additional funding available for charities and organisations with £1.4 million available over the next five years.

## 13.4 Climate resilience

- The effects of climate change have led to some dramatic weather patterns in recent years. Storm Desmond in 2015 caused flooding at Lancaster's major substation leaving more than 60,000 customers without power. In 2023/24 we felt the impact of several named storms that had a significant impact on our network. We are committed to making our network more resilient to the potential impact of climate change and improving flood defences to our major substations including 1/1000 year resilience for those serving more than 10,000 customers.

## 13.5 Engaging with our stakeholders

- Stakeholder engagement is critical for how we ensure that we are serving the needs of our customers in the North West. We know that engaging with our stakeholders will deliver better long-term outcomes for us and our region.
- We are an integral part of the North West and play a key role in the development and delivery of the ambitions of the region. As the way we live our lives continues to change and the demand on energy increases we know that we need to engage with our stakeholders to help them live their lives, run their businesses and grow in the best way possible to secure a low carbon future.
- Our stakeholder advisory panels are an integral part of our Stakeholder Engagement Strategy and are made up of key stakeholder organisations and individuals that provide insight into our stakeholders' priorities and help influence our business decisions.
    - The Environment and Sustainability Advisory Panel consists of environment and sustainability experts who provide advice, guidance and oversight of our sustainability performance. The panel is chaired by an independent chair and the aim of the panel is to inform our decisions on how we manage and alleviate our environmental impact within the region by providing feedback on environmental issues that we should prioritise as a business.



# 14. Appendix

**14.1** We have included data on our 2023/24 environmental commitments in the following areas: business carbon footprint, $SF_6$, electricity distribution losses, supply chain management, resource use and waste, visual amenity, noise pollution, PCB and fluid filled cables in the Annual Environment Report KPI tracker, you can view the data here: Environment report (enwl.co.uk)

**14.2** You can access the following documents for 2023/24 on our website on the link above:

- Regulatory Reporting Pack and Commentary
  - 2023/24 Environment and Innovation Reporting Pack
  - 2023/24 Environment and Innovation Commentary
- Cost Benefit Analysis (Losses)
  - 2024 CBA for Theft of Electricity v1
  - 2024 Install 300sqmm vs 185sqmm HV Cable
  - 2024 Install 300sqmm vs 185sqmm LV Cable
  - 2024 Proactive 1000kV GMT Replacement
  - 2024 Programme 23MVA Replacement 2
- Smart Meters
  - RIIO-ED2_Cost Benefit Analysis_Template_Smart Metering FY24 V1.1

# 15. Glossary

| Abbreviation | Meaning |
|---|---|
| AONB | Area of Outstanding Natural Beauty |
| BAU | Business As Usual |
| CBA | Cost Benefit Analysis |
| CEG | Customer Engagement Group |
| CI | Customer Interruptions |
| CLO | Carbon Literate Organisation |
| CML | Customer Minutes Lost |
| CSR | Corporate Social Responsibility |
| DCC | Data Communications Company |
| DG | Distributed Generation |
| DSO | Distribution System Operator |
| DSR | Demand Side Response |
| EV | Electric Vehicle |
| FSC | Fault Support Centre |
| HV | High Voltage |
| IRM | Innovation Rollout Mechanism |
| kVA | Kilo Volt Ampere (unit of power) |
| LCN | Low Carbon Networks |
| LCT | Low Carbon Technologies |
| LV | Low Voltage |
| NIA | Network Innovation Allowance |
| NIC | Network Innovation Competition |
| NMS | Network Management System |
| OLTC | On Load Tap Changer |
| PV | Photovoltaic |
| SAP | Sustainability Advisory Panel |
| $SF_6$ | Sulphur Hexafluoride |
| $tCO_2e$ | Tonnes Carbon Dioxide equivalent |
| TOS | Transforming Our Spaces |

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