

# Environmental Action Plan

Our plan to enable the decarbonisation of our network and to reduce our wider environmental impacts brought on through network activity

February 2021

## About Electricity North West

Electricity North West Limited is one of 14 electricity distribution network operators (DNOs) in Great Britain. We are responsible for maintaining and upgrading 56,000km of network and nearly 500 major substations across the region. We supply the electricity to the diverse communities in the North West of England which extends from Macclesfield all the way up to Carlisle.

We are regulated by the Office of Gas and Electricity Markets (Ofgem) who provide DNOs with the license to operate and decide what's fair for us to charge our customers for each price control period.

Our current price control began in 2015 and runs to 2023. It's referred to as RIIO-ED1. In full, that stands for Revenue = Incentives + Innovation + Outputs, Electricity Distribution 1. Under this framework, the price we can charge our customers is fixed until the next price control, RIIO-ED2, which will run from 2023 until 2028.

Work is already underway to set the framework for RIIO-2 that applies to all energy network companies (i.e. gas and electricity distribution). The framework will determine what RIIO ED2, which begins on 1<sup>st</sup> April 2023, looks like.

The period of time which the RIIO-2 price control covers will see significant change in the way electricity is generated, consumed and stored, driving innovation across the whole energy system both now and into the future.

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## Welcome

Welcome to our Environmental Action Plan which sets out our strategies to enable the decarbonisation of our network and to reduce the wider environmental impacts of our network activity.

Our electrical distribution network plays a critical role in ensuring that the industry, businesses, public services and households that operate within our area can continue to function.

Our network in the North West of England is diverse, from the serene landscapes of the Lake District, Peak District and Yorkshire Dales National Parks, to the bustling urban centres in the south of our region. It encompasses coastline, mountains, lakes, moorland, freshwater, woodland and the green spaces of our towns and cities, and provides habitat for a wide-range of flora and fauna.

The natural environment can be of great benefit to our health and well-being. Electricity North West Limited (ENWL) has already made great strides to improve our environmental performance and limit the environmental impact on the area in which we operate. But we simply cannot stop there. We need to go further.

Our regions role in the start of the industrial revolution was pivotal to the growth and technology we see today, but it has come at a potential cost. Inaction would result in contributing to the acceleration of climate change brought on by greenhouse gas emissions, a decrease in the natural biodiversity of our landscape, an increase in pollution brought on by the leakage of contaminants and the further depletion of natural resources.

We believe we have a vital and strategic role in our region to limit greenhouse gas emissions, to improve the natural biodiversity and to have a minimal impact on the environment.

In this Environmental Action Plan, we have set out the steps we will take to continue our decarbonisation journey and to reduce the wider environmental impacts of network activity. By taking these actions, we believe we will be a leader in sustainability within the North West.



Steve Cox

Engineering & Technical Director

## Tell us what you think

This strategy is a work in progress. We have considered and incorporated the customer and stakeholder feedback we have received to date, but there are still areas where we need your input.

This strategy includes a series of questions, your responses to which will help inform our future approach. Please refer to the content in each relevant section before responding to the questions- we have repeated the questions throughout the document for ease. In addition to the questions listed below, we would welcome your feedback on any aspects of this document. We will routinely review our EAP and your responses will help us to develop and improve our approach to decarbonisation and reducing the wider environmental impact of network activity.

- *Do you feel by undertaking the actions outlined in our EAP, Electricity North West will deliver meaningful improvements in environmental management to both ourselves and our value chain?*
- *Do you feel that we have shown an appropriate level of ambition to decarbonise our network during the RIIO-ED2 period (2023-2028)?*
- *Do you feel that we have shown an appropriate level of ambition to reduce the wider environmental impacts of network activity during the RIIO-ED2 period (2023-2028)?*
- *Do you believe that through implementing our EAP, we will provide leadership and influence other organisations in the North West on their decarbonisation journey?*
- *Do you believe that through implementing our EAP, there will be a meaningful and noticeable step change from our current position?*
- *Are there any comments or suggestions that you have in relation to how we could improve our EAP?*

## Executive summary

Electricity North West is responsible for the energy network used to supply electricity to 2.4 million homes and businesses within the North West of England. We use 44,300 km of cables, 12,600 km of overhead and nearly 500 major substations to ensure the power flows in our region.

Our view, which is firmly supported by our stakeholders, is that we should be a leader and influencer in decarbonisation and take real actions to limit the impact we have on the environment, enhancing it where possible.

Within this plan, we have identified actions that we can undertake now and during the RIIO-ED2 period to decarbonise our energy network, support the transition to a low carbon economy and reduce our other environmental impacts.

It is clear from UK Government policy, our regional local authorities and our stakeholders that we must achieve decarbonisation rapidly to avoid the worst impacts of climate change. Our stakeholders have clearly identified that we should provide more ambition than the UK Government's aspiration to achieve net zero carbon by 2050.

In RIIO-ED1 we have significantly reduced our business carbon footprint; for the remainder of the current period, the entirety of RIIO-ED2 and beyond, we will use science-based targets<sup>1</sup> to achieve net zero carbon by 2038. We will achieve this by methods such as reducing energy consumption at our buildings and substations, managing the amount of energy lost on our transmission network and managing leaks of potent greenhouse gases.

We will reduce the wider environmental impact of network activity by:

- Influencing our supply chain to improve their environmental management standards.
- Removing older fluid-filled cables from our network and reducing the leakage rates into the environment.
- Removing equipment from our network that contains highly toxic substances.
- Enhancing biodiversity across our network.
- Being responsible consumers of resources and further embedding the circular economy within our business.

A summary of our activities to decarbonise and reduce the wider environmental impact of network is shown in Figure 1.

The progress against these activities will be provided in our Annual Environmental Reports which will be publically available throughout RIIO-ED2.

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<sup>1</sup> Science-based targets (SBTs) are clearly defined pathways that show companies by how much and how quickly they must reduce their greenhouse gas emissions to prevent the worst effects of climate change.

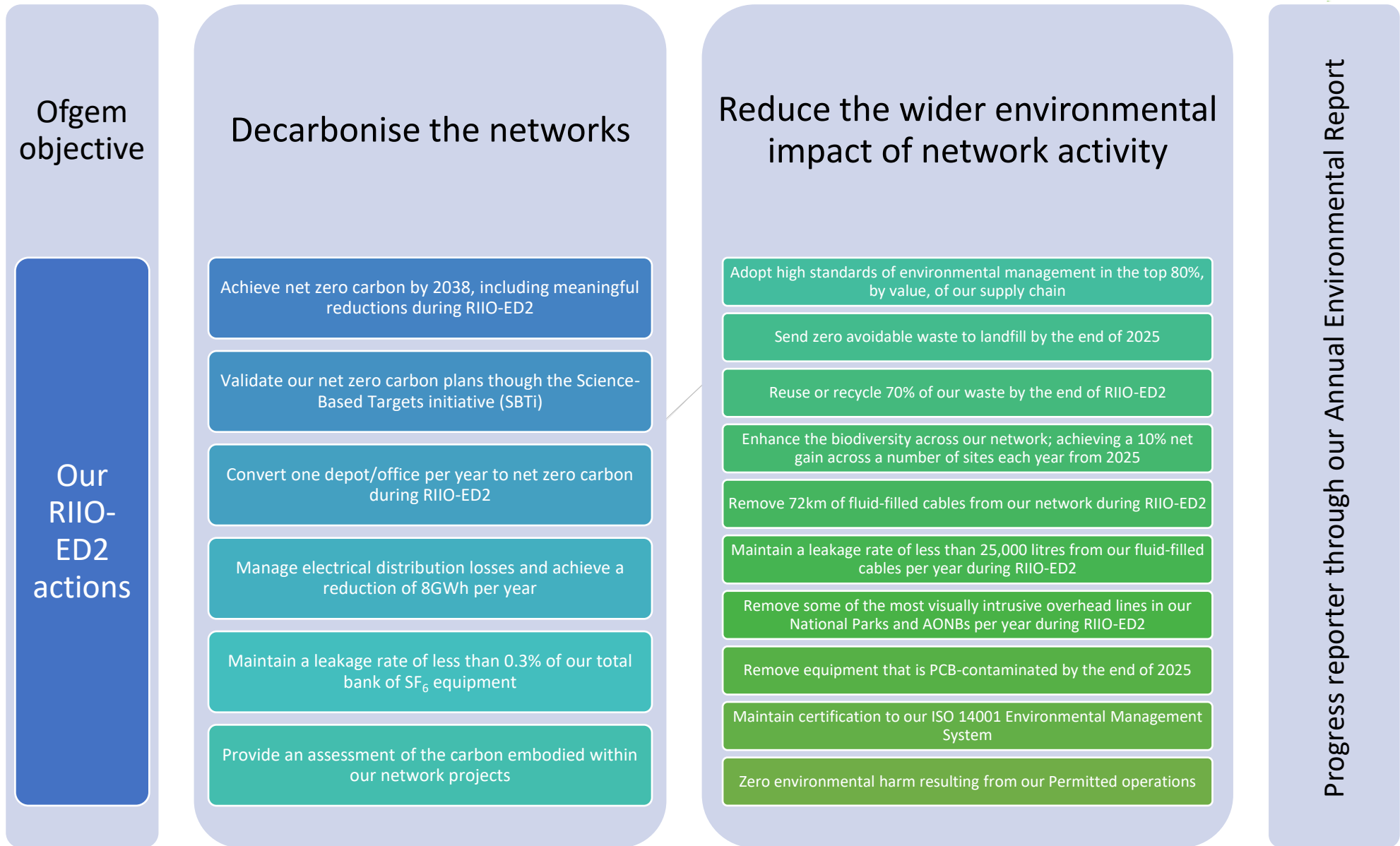


Figure 1: Summary of our Environmental Action Plan

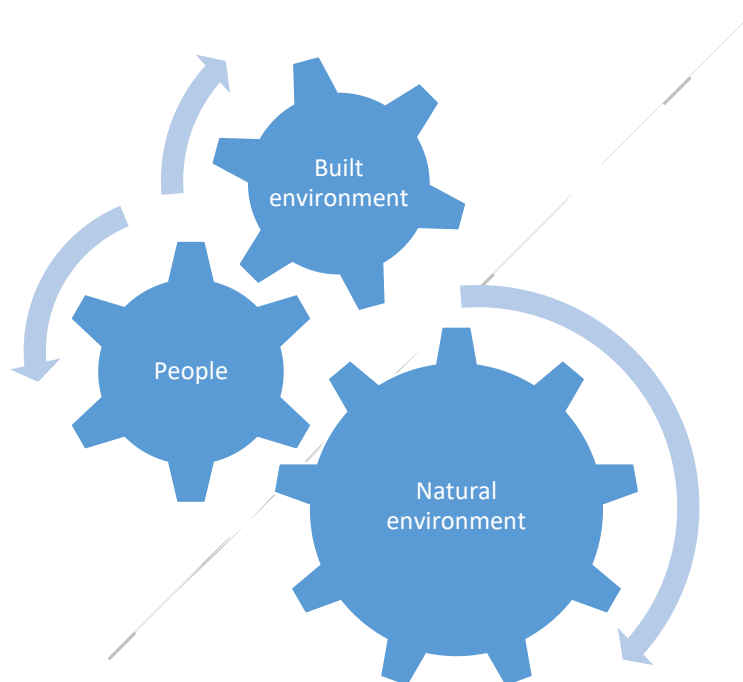


## 1. Our Environmental Action Plan

Our Environmental Action Plan (EAP) details our responsibilities to the environment and outlines the steps we will take during the RIIO-ED2 period to drive improvements in environmental performance. It has been written to not only comply with the requirements of Ofgem's RIIO-ED2 business plan guidance but to exceed the minimum standards that they expect.

We have consulted with customers and key stakeholders to form this EAP and will produce Annual Environmental Reports throughout RIIO-ED2 to report on our progress against our objectives and targets.

This EAP is built on the principles of the components of the natural environment, built environment and people being intrinsically linked to overall sustainability.



Throughout this EAP, we have set out our long-term visions to reduce the impact we have on the environment. For each of these visions, we have our goals for the RIIO-ED2 period with commitments to how we will achieve these goals, and the benefits to the environment that these commitments bring.



## Leading the Way

We provide an essential service to ~10% of Great Britain, being made up of 2.4 million homes and businesses. We use 44,300 km of cables and 12,600 km of overhead lines to move electricity from the transmission interface to the customer. The potential influence we can provide is vast.

During the development of our regions net zero ambitions, it has become clear that stakeholders had a real need for us to:

- Support regional decarbonisation ambitions
- Provide 'thought leadership'
- Have a role as a regional trusted advisor
- Provide infrastructure/means to facilitate low carbon transition
- Lead by example
- Invest to support community and local energy projects

It is clear that we must play a crucial part in leading and enabling decarbonisation across the North West. The importance of decarbonisation and the environment within Electricity North West is clear to our staff, contractors and stakeholders. We hold ourselves to account on progress and ambition in these areas and the commitments shown in this EAP are a demonstration of how we will lead the way in RIIO-ED2 and beyond.

## Electricity North West's direct environmental impact

We take our environmental responsibilities very seriously and are working hard to reduce the effect we have on the environment, both in terms of our carbon emissions and the other impacts we have.

The terms in the table below are shown alongside the definition that should be applied within this EAP.

Table 1: Key definitions

Term	Definition
Biodiversity	The variety of all life on Earth. It includes all species of animals and plants - everything that is alive on our planet.
Biosecurity	A set of precautions that aims to prevent the introduction and spread of harmful organisms.
Business carbon footprint	The total amount of greenhouse gases produced to directly and indirectly build and operate a product or business, usually measured in tonnes of carbon dioxide equivalent (tCO <sub>2</sub> e).
Circular economy	The circular economy is based on the principles of designing out waste and pollution, keeping products and materials in use, and regenerating natural systems. It is an alternative to the traditional linear economy.
District Network Operator (DNO)	A Distribution Network Operator (or DNO) is a company licensed to distribute electricity in the UK. These companies, such as Electricity North West Limited, own and operate the system of cables and towers that bring electricity from the national transmission network to our homes and businesses.
Embodied carbon	The total greenhouse gas (GHG) emissions (often simplified to “carbon”) generated to produce a built asset. This includes emissions caused by extraction, manufacture/processing, transportation and assembly of every product and element in an asset. It may also include the operation, maintenance, replacement, deconstruction, disposal and end-of-life aspects of the materials and systems that make up the asset.
Environmental aspect	An environmental aspect is an element of an organisation’s activities that interact with the environment. Examples include discharges to water, emissions to air and the use of natural resources.
Environmental impact	An environmental impact is a change to the environment. It can be either positive, such as an increase in biodiversity, or negative, such as the pollution of a watercourse.
ISO 14001	The international standard for Environmental Management Systems
ISO 50001	The international standard for Energy Management Systems
Linear economy	The linear economy is the traditional model of using raw materials to make a product, use the product and then dispose of it.
Natural capital	The world's stocks of natural assets which include geology, soil, air, water and all living things. Biodiversity is a part of natural capital.
Net Zero carbon	Achieving a state in which the activities within the value-chain of an organisation result in no net impact on the climate from greenhouse gas emissions
NOx	The term given for nitrogen oxides that are relevant to air pollution. These are nitric oxide (NO) and nitrogen dioxide (NO <sub>2</sub> ).

Term	Definition
Ofgem	The Office of Gas and Electricity Markets, are a non-ministerial government department and an independent National Regulatory Authority whose role is to protect consumers now and in the future by working to deliver a greener, fairer energy system.
RIIO-ED1	The first electricity distribution price control to reflect the new RIIO (Revenue = Incentives + Innovation + Outputs) model for network regulation, running from 2015 – 2023.
RIIO-ED2	The second electricity distribution price control to reflect the new RIIO (Revenue = Incentives + Innovation + Outputs) model for network regulation, running from 2023 – 2028.
Science-based targets	A clearly defined pathway to future-proof growth by specifying how much and how quickly to reduce greenhouse gas emissions. Targets adopted by companies to reduce greenhouse gas (GHG) emissions are considered “science-based” if they are in line with what the latest climate science says is necessary to meet the goals of the Paris Agreement – to limit global warming to well-below 2°C above pre-industrial levels and pursue efforts to limit warming to 1.5°C.
Scope 1 emissions	Carbon equivalent emissions that are direct emissions from owned or controlled sources, such as the emissions associated with road transportation.
Scope 2 emissions	Carbon equivalent emissions that are indirect emissions from the generation of purchased energy.
Scope 3 emissions	Carbon equivalent emissions that are indirect emissions (excluding scope 2 emissions) that occur with the value chain of the reporting company.
SF <sub>6</sub>	Sulphur hexafluoride – a potent greenhouse gas used widely transmission and distribution network voltages as both an insulating and arc-extinguishing gas.
Waste hierarchy	The waste hierarchy ranks waste management options according to what is best for the environment, with the prevention of waste the most preferred option and disposal the least preferred. This hierarchy should always be followed to reduce waste arisings and promote the principles of the circular economy.

## 2. Progress to Date

During the first five years of RIIO-ED1, from 2015/16 – 2019/20, we have made notable improvements in our environmental performance including:

- A 26% reduction in our business carbon footprint
- An average saving of over 3,772 tonnes of carbon dioxide (CO<sub>2</sub>) equivalent (tCO<sub>2</sub>e) emissions per year
- A total of 34.4km of overhead lines undergrounded in National Parks and Areas of Outstanding Natural Beauty (AONB)
- The removal of 78.5km of oil-filled cables that would have had the potential to leak and pollute the environment
- A reduction in electrical distribution losses of 84.41 GWh, equivalent to 8,300 tCO<sub>2</sub>e

### Business Carbon Footprint

Our business carbon footprint has reduced from 24,515 tCO<sub>2</sub>e at the end of DPCR5 to 18,051 tCO<sub>2</sub>e by 2019/20. We intend to reduce this further by the end of RIIO-ED1.

The business carbon footprint reported in RIIO-ED1 is divided into three areas, or scopes:

- Scope 1 = Operational transport, business transport (road), fugitive emissions (sulphur hexafluoride) and fuel combustion
- Scope 2 = Building energy use, including substations
- Scope 3 = Business travel (rail and air).

Reductions in the business carbon footprint have been achieved through 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 year to year progression is shown below.

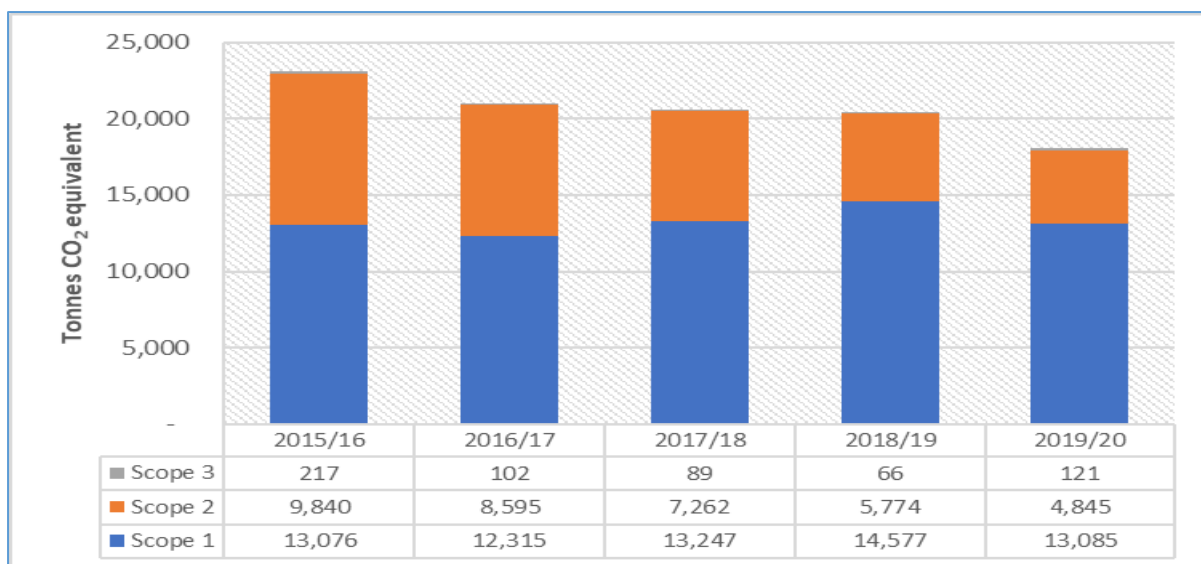


Figure 2: Our business carbon footprint during RIIO-ED1

## Electrical Distribution Losses

Distribution losses are the difference between the energy entering the network at one end and the energy received by customers. Losses can be divided into technical and non-technical. **Technical losses** occur as a direct result of the physical characteristics of the electrical equipment used to distribute electricity and are usually lost in the form of heat. **Non-technical losses** relate to energy which cannot be accounted for, such as errors in measuring energy and theft.

Distribution losses have been reported in addition to the business carbon footprint shown in Section 2.1 and account for over 90% of overall carbon equivalent emissions each year. Our distribution losses have reduced from 667,982 tCO<sub>2</sub>e in the first year of RIIO-ED1 to 293,794 tCO<sub>2</sub>e in 2019/20. This has been achieved through the opportunistic replacement of assets with more efficient equivalents, including modern lower loss transformers and installing larger, lower loss cables across the network, as well as a change in the UK government electricity emission factor (i.e. the losses in each year of RIIO-ED1 are not directly comparable in tCO<sub>2</sub>e).

We have reduced losses by 84.41 GWh through a variety of techniques, as shown in the table below:

Table 2: Techniques used to reduce losses in RIIO-ED1

Programme/ project title	RIIO-ED1
	2015/16 – 2019/20
	GWh
Standardise use of 300mm <sup>2</sup> HV cable	21.51
Standardise use of 300mm <sup>2</sup> LV cable	8.90
Proactive replacement of pre-1990 1000kVA transformers	11.96
Proactive replacement of pre-1990 800kVA transformers	6.44
Opportunistic primary transformer replacement	4.18
Opportunistic 200kVA pole-mounted transformer replacement	0.39
Relevant theft of electricity action	31.03
<b>Total</b>	<b>84.41</b>

The business carbon footprint for the first five years of RIIO-ED1 with the inclusion of distribution losses is shown in the chart below. The emission factor for losses has changed which, together with

the large proportion of overall losses, results in the reduction being exacerbated. The graph shows the reduction in losses against three different calculations, that being the emission factors on a variable scale (taking the emission factor in each individual year), using the FY16 and FY20 carbon factors.

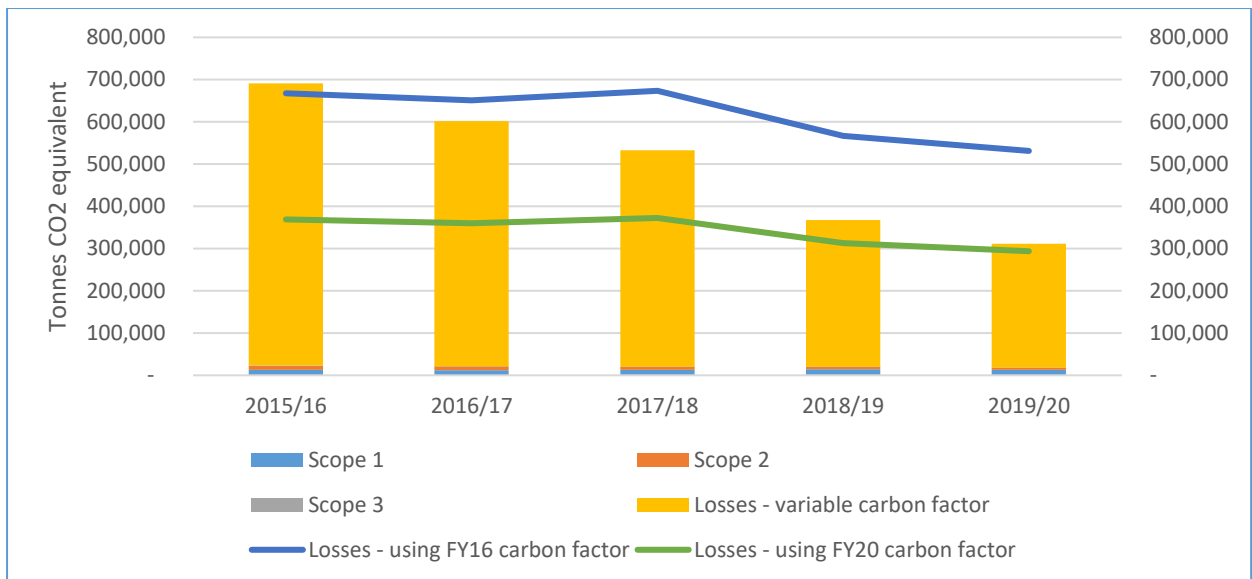


Figure 3: Our business carbon footprint (including losses) during RIIO-ED1

### Sulphur Hexafluoride

Sulphur hexafluoride (SF<sub>6</sub>) has been used in switchgear applications at all transmission and distribution network voltages as both an insulating and arc-extinguishing gas. It is a greenhouse gas having a global warming potential (GWP) of 22,800 times that of CO<sub>2</sub>.

Over the eight-year 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. On average, our fugitive emissions of SF<sub>6</sub> have been 0.32% of our total bank during the first five years of RIIO-ED1.

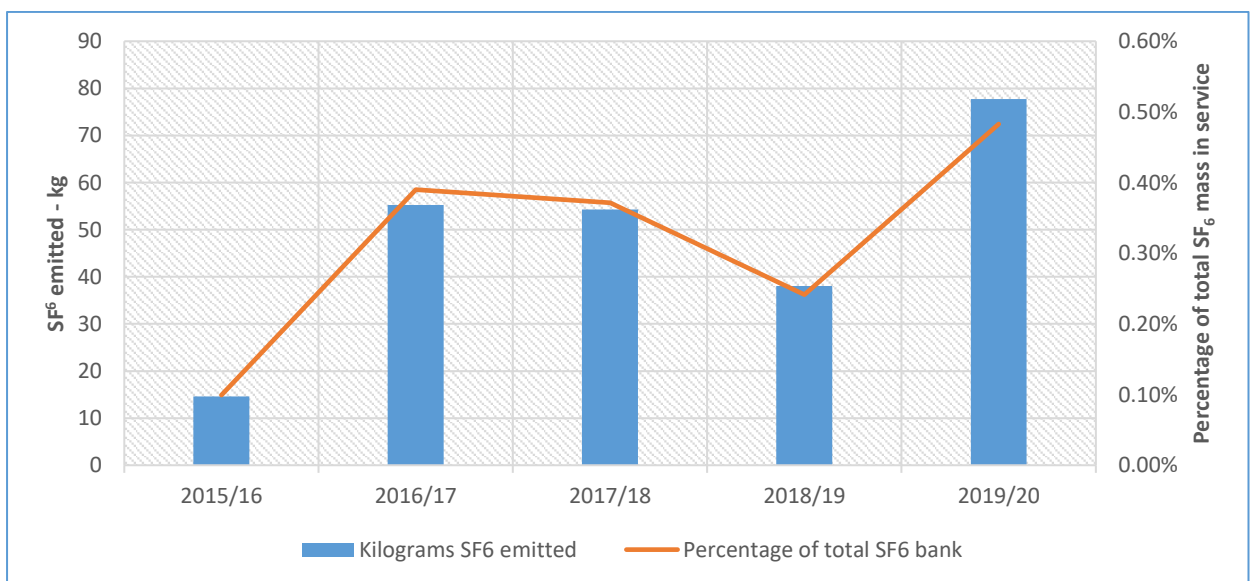


Figure 4: Sulphur hexafluoride emissions during RIIO-ED1

## Leaks from Fluid-Filled Cables

Fluid-filled cables were installed from the late 1950s to the early 1970s as part of the 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.

Our RIIO-ED1 target was to maintain a leakage rate of less than 30,000 litres per year by 2023. By the end of 2019/20, we had reduced the leakage rate to 21,616 litres. We have also removed 78.5km of fluid-filled cables in the first five years of RIIO-ED1 and plan to remove a further 25km during the final three years of the period.

Our progress during RIIO-ED1 is shown in the chart below:

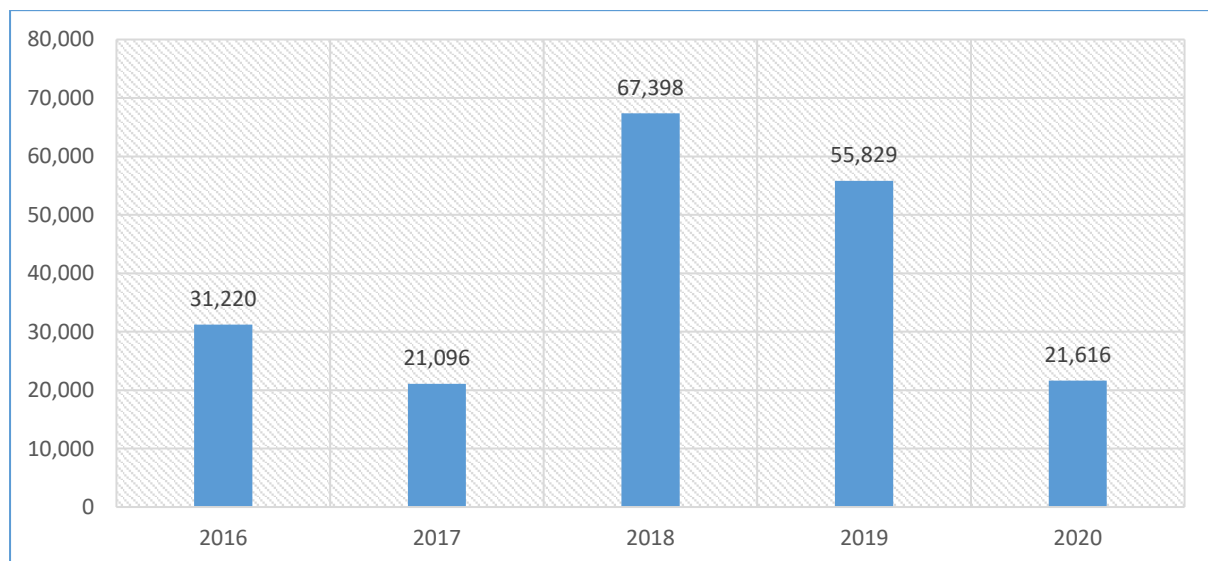


Figure 5: Leaks from fluid-filled cables during RIIO-ED1

## Visual Amenity

There are three National Parks and four Areas of Outstanding Natural Beauty (AONB) either wholly or partially within our region.

- Arnside and Silverdale AONB
- Forest of Bowland AONB
- North Pennines AONB
- Solway Coast AONB



- Lake District National Park
- Peak District National Park
- Yorkshire Dales National Park

We have a programme of undergrounding overhead lines (OHL) for visual amenity benefits. By the end of the fifth year of RIIO-ED1, we have removed a total of 34.4km of OHL. It is likely that the total length of cable undergrounded will be around 65km by the end of RIIO-ED1.

The OHL lines removed during each year of RIIO-ED1 to date is shown in the chart below (in kilometres):

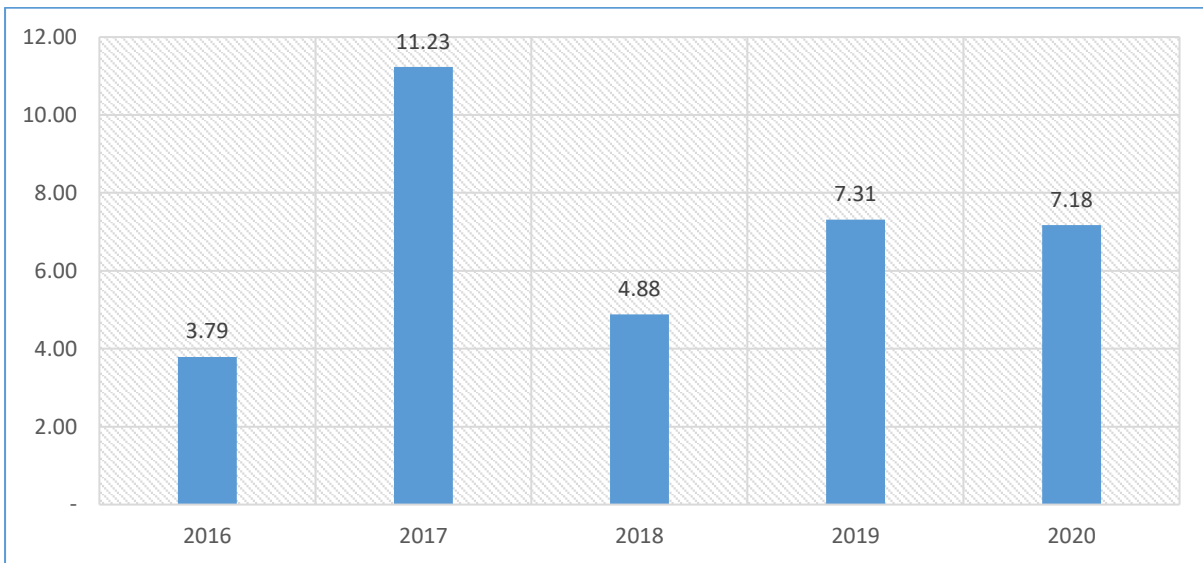


Figure 6: Undergrounding overhead lines for visual amenity benefits during RIIO-ED1

### 3. Our Approach to RIIO-ED2

Our responsibility as a business lies not only with providing an essential service, maintaining the electricity network and investing in the future of the North West, but ensuring we take a responsible approach in everything we do including how we treat our people and partners, our community and our environment.

Our ‘Transforming our Communities’ framework has been developed in line with our company Purpose of ‘Together we have the energy to transform our communities’, and our Principles of being switched on, adaptable and taking pride.

Our Purpose and Principles sets out what we do, how we do it and how it shapes how we run our business. Our framework supports this and demonstrates how we consider social, environmental and economic impacts in all our activities and ensures that we adopt a responsible approach to everything we do.

Our framework is embedded across our business and is part of everything we do. The framework is divided into three key impact areas: our people and partners, our community and our environment. These are further divided into a number of goals which reflect issues that are important to our business, our customers and our colleagues.



Figure 7: Electricity North West Responsibility Framework

‘Our environment’ forms a key part of our responsibility framework, with four specific goals falling under this impact area:

- Enhancing biodiversity and ecosystems
- Optimising waste and resource use
- Driving down our carbon emissions
- Helping customers and colleagues drive down emissions

Through the implementation of this Environmental Action Plan, we will meet these environmental goals that make up key components of our responsibility framework during RIIO-ED2.

## Supporting the Low Carbon Energy Transition

Rapid decarbonisation is critical if we are to limit global warming. Through investment and innovation, as the regional network provider, we play a major role in helping the North West meet its carbon reduction targets.

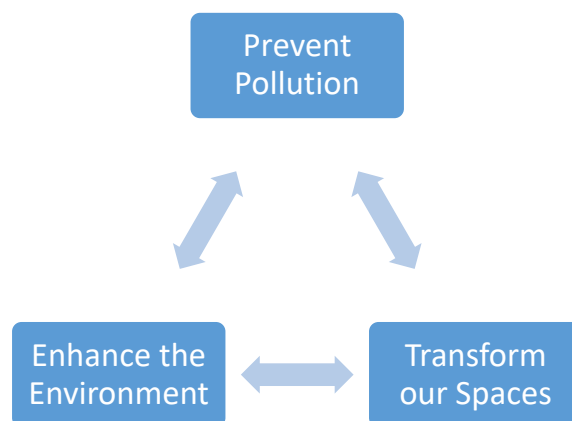
Our role is significantly changing, electricity distribution is no longer one directional (from generator to consumer). It has become increasingly multidirectional and with the inclusion of generation and low carbon technologies such as electric vehicles it has become a lot more complex than before. To be a responsible business we not only have to change the way we operate but also influence and challenge the behaviour of our colleagues, stakeholders and customers and ensure they have the necessary tools, skills and information to reduce their own environmental impact.

We have taken a carbon budget approach to reducing our emissions with the aim of reaching zero carbon by 2038. This will support our stakeholders' aspirations, including Greater Manchester's target of carbon neutrality by 2038 and the activities of the Lake District National Park Climate Change partnership to create a low carbon Lake District.

However, our commitment to the environment extends beyond our carbon emissions performance and recognises our role in optimising waste, including plastic and resource use and increasing our commitment around biodiversity and ecosystems.

## Our Environmental Management System

Electricity North West Limited operates to a certified Environmental Management System (EMS) standard; ISO 14001:2015. Its purpose is the prevention of pollution, the enhancement of the environment and transforming the spaces in which we operate.



Our EMS and its implementation is scrutinised annually by independent auditors to check that we are meeting the requirements of the EMS standard and to ensure that we are reporting and investigating where we do not get it right.

Our EMS identifies:

- Our activities that have the potential to interact with and impact the environment. These are known as environmental aspects
- Where actions are required to mitigate our environmental aspects that can have the biggest severity of impact

- Legal and other requirements that are relevant to our operations and the environment
- Opportunities to improve our environmental performance
- Responsibilities to implement the EMS requirements and report on non-conformances
- Training and competence required to implement the EMS effectively
- Requirements for the auditing of our activities and system processes

The status of the above activities is formally reviewed by our Executive Leadership Team to ensure that sufficient controls, objectives and targets are put in place to drive forwards improvements in environmental performance.

We will continue to use and enhance our EMS throughout RIIO-ED2 to support our goals and commitments.

### Our Energy Management System – ISO 50001

Electricity North West Limited operates to an Energy Management System (EnMS) standard: ISO 50001:2018.

The purpose of our EnMS is to minimise and reduce the total energy used in our operations. Installing solar panels on a building, whilst providing energy from a renewable source, would not reduce electricity consumption. Replacing a boiler or vehicle with a more efficient equivalent would reduce overall energy consumption.

The EnMS is built around an energy review, which is an assessment of our energy use and consumption, particularly those that are significant, and identification of opportunities for improving energy performance. There are a range of planning inputs and outputs, as shown in the figure below.

As with our EMS, the performance of the EnMS is formally reviewed by our Executive Leadership Team, who play a leading role in setting our objectives and targets to drive forwards improvements in energy efficiency.

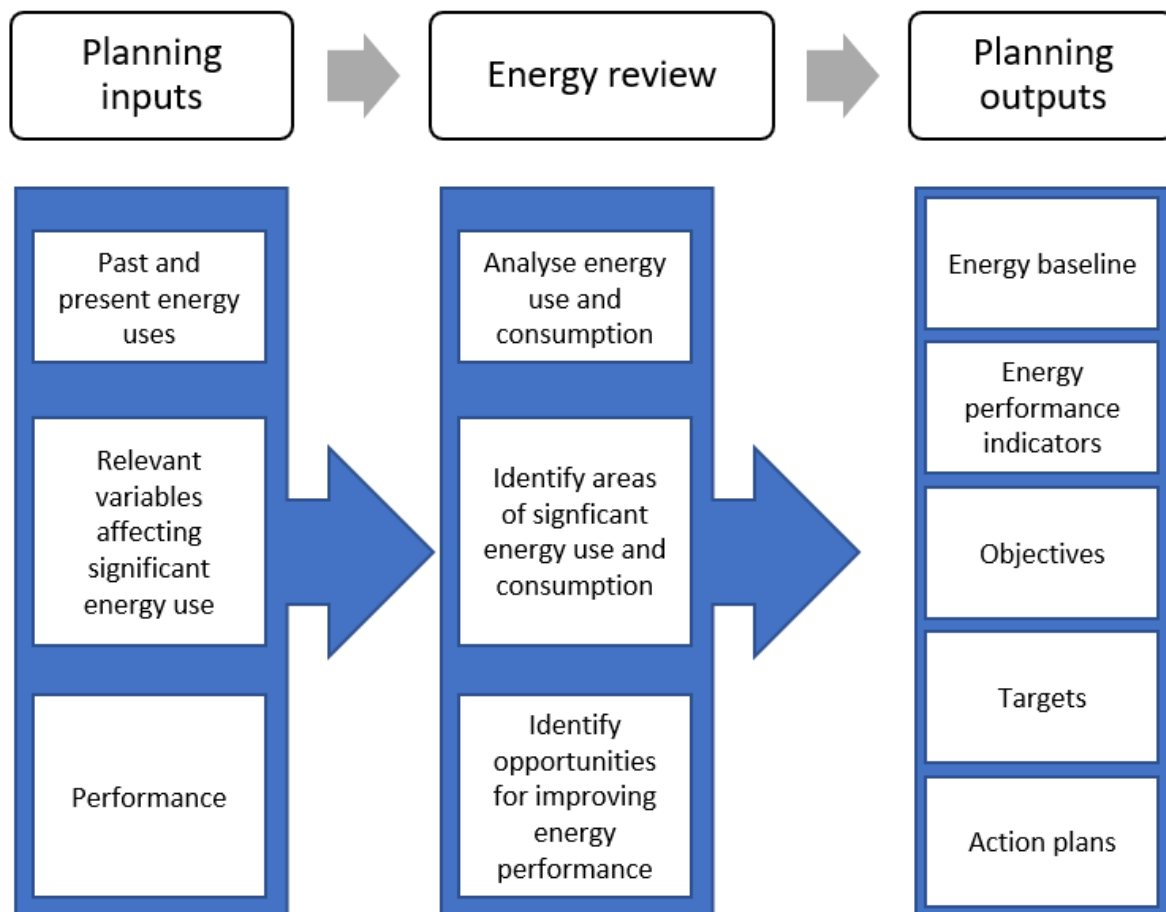


Figure 8: Our Energy Management System components

## How we Developed Our Plan

In order to prioritise action areas and to set objectives and targets to improve environmental performance, it is critical to first understand how our activities interact with the environment and the resultant actual or potential impact on the environment. We continually monitor existing and new aspects as part of our ISO 14001 Environmental Management System.

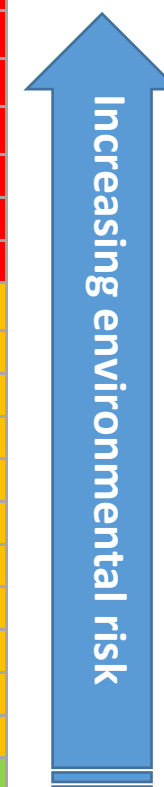
Environmental aspects and the impacts they have can be far reaching; our ISO 14001 EMS has identified those shown in Table 3 as being the most prominent ones from our activities.

In order to assess the aspects and their impacts, we have assigned two factors – the likelihood and severity. Likelihood is based on how likely it is for that aspect to occur, with severity being the impact that this could have on the environment. A normalisation factor has been applied to the ratings to take account of specific activities we undertake. For instance, the likelihood associated with buildings energy usage is high, as this is a daily occurrence, whilst ordinarily this could contribute significantly to greenhouse gas emissions. However, we have applied a 0.5X normalisation factor as we currently source 100% of the energy we use in our buildings from renewal sources, including through energy generated on site through photovoltaic (PV) solar panels.

The likelihood has been multiplied by the severity, with the normalisation factor then applied to provide a total risk rating. The risk ratings, together with our stakeholder feedback and Ofgem requirements, have been used to inform our EAP actions.

Table 3: Electricity North West key environmental aspects and impacts

Activity	Environmental Aspect	Environmental Impacts	Risk
Network operation	Electrical distribution losses	Contribution to climate change	H
Transportation	Use of fossil fuels (internal combustion engines)	Contribution to climate change	H
Transportation	Emissions to air – NOx, SO2, PM <sub>2.5</sub> , VOCs	Reduction in air quality	H
Plant operation	Resource consumption; Emissions to air – SF <sub>6</sub>	Contribution to climate change	H
Network operation, maintenance & construction	Release of contaminants to land – oil	Contamination of ground; impacts on health & the environment	H
Network operation, maintenance & construction	Use of raw materials	Depletion of natural resources; embodied carbon	H
Network operation, maintenance & construction	Waste generation	Depletion of resources; contribution to climate change	H
Buildings electricity use	Emissions to air – CO <sub>2</sub>	Contribution to climate change; resource consumption	M
Network operation, maintenance & construction	Failure to identify and manage impacts on land	Loss of habitat; Reduction in biodiversity	M
Network operation, maintenance & construction	Release of contaminants to land – creosote	Contamination of ground; impacts on health & the environment	M
Network operation, maintenance & construction	Release of contaminants to water – creosote	Pollution of watercourses; impacts on health & the environment	M
Network operation, maintenance & construction	Release of contaminants to water – oil	Pollution of watercourses; impacts on the environment	M
Use of overhead lines	Visual amenity	Visual impact on the landscape	M
Use of overhead lines	Obstacle	Obstacles on flight paths to migratory birds	M
Office activities & dust suppression	Water consumption	Depletion of natural resource; increased carbon footprint	M
Use of cooling equipment	Emissions to air – HFC gases	Contribution to climate change	M
Oil storage and reprocessing	Emissions to air – VOCs	Reduction in air quality	M
Impact on traffic congestion	Emissions to air – NOx, SO2, PM <sub>2.5</sub> , VOCs	Contribution to climate change; impacts on health & the environment	M
Network operation, maintenance & construction	Noise and vibration	Nuisance to residents and wildlife	L



## Our 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 environmental 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.
- Fully 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 significant 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.
- 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.

## Meeting Stakeholder Expectations

As a responsible business, it is paramount that we obtain input and feedback on our RIIO-ED2 business plan from customers and stakeholders. This feedback has been central to the development of our overall business plan and stakeholder engagement will always play an important role in helping us to define our priority areas and ambition, set goals, and ultimately meet the targets we set.

Our business plan develop consists of six stages:



Figure 9: Six stages of developing our RIIO-ED2 Business Plan

The nature of the first four stages of this process with their intended outputs is detailed below:

Table 4: Stages of Business Plan Development

Stage	Nature of phase	Output
Customer connection	A study of the realities of customers' day to day life and understanding what matters to them	Understanding of stakeholder high-level priorities
Electricity in my life	Sharing and discussing the day to day impact of the changing nature of energy production, supply and use	Detailed understanding of stakeholders needs and wants
Our plan for the future	Evaluating our ideas and plans to make sure they are right, with a focus on understanding trade-offs, investment priorities, willingness to pay and level of ambition for the future	Detailed understanding of stakeholder willingness to pay
Sweating the detail	Further refinement of our plan and detailed exploration around specific issues. Checking customer acceptability of overall plan	Detailed understanding of stakeholder acceptability of overall plan

Our overall RIIO-ED2 submission contains a more in-depth details of the journey from the high-level concepts through to our comprehensive plans, and the central role that stakeholders have had in helping to shape this.

To develop and refine our EAP, we have engaged with a wide range of stakeholders. These include consumers, vulnerable customers and environmental and sustainability experts.



## Customer Connection Phase

Key insights	Consumers and wider stakeholders expect us to lead by example – accelerating action to minimise our business carbon footprint
	Think beyond the asset by increasing biodiversity in urban areas
	Traffic congestion caused by street works is not only an irritation but adds to noise and air pollution
	Electricity pylons cause an impact on the natural beauty of designated areas
	Most consumers feel that ‘green thinking’ and reducing any environmental impact is an important area to focus on and expect it to be appropriately represented in the Business Plan as part of Electricity North West being a good corporate citizen

Throughout RIIO-ED1, we have observed customers showing increasing support for and urgency about protecting the environment. During the customer connection phase we heard from a diverse range of customer types during qualitative focus groups which enabled us to deepen our understanding of their attitudes and expectations.

Consumers typically perceived minimising our direct environmental impact to be something that should be happening anyway as it is within our direct control and is encapsulated within being a good corporate citizen.

We heard that we have a duty to maintain our network in an economical and efficient way, to preserve amenity, and to conserve and enhance the natural beauty, wildlife and the cultural heritage of designated landscapes. This is particularly important in the North West where we are proud to have three National Parks and four Areas of Outstanding Natural Beauty (AONBs) either wholly or partially within our region. This initiative also draws support from consumers:

“Environmentally wise, it would be a lot nicer and a lot prettier to underground wires. I mean you come down the M6 and you look to your right going past Shap and there is just pylon, pylon, pylon. I thought they were meant to be getting rid of these. I just think they should keep this area pretty.” (Kendal, domestic customer)

Stakeholders told us that as the provider of an essential service to nearly 2.4 million homes and businesses across Cumbria, Lancashire and Greater Manchester we should take a leading role in developing and implementing the policies, technologies, systems and workforce required to achieve the Government’s decarbonisation targets by 2050. In our stakeholder priorities research, we heard that to support the transition to a low carbon economy we should lead by example and improve environmental performance in our day-to-day operations through greener work-sites, offices and vehicles.

In our close engagement with local authorities, we heard that CO<sub>2</sub> emissions have declined over the last 30 years and that this has largely been due to national action to change the way in which electricity is produced. We heard that achieving the significant and rapid reductions needed for our region to make a fair and equitable contribution to meeting UK climate change targets will require more radical local action and that as an anchor institution in the North West we have an important role to play in supporting this.

Our stakeholders also told us that we should think beyond the asset by doing more to address complaints from residents near our substations by increasing biodiversity and attracting pollinators in urban areas, thereby reducing vandalism and ultimately giving communities spaces to take pride in.

Through analysis of consumers' attitudes, we heard that 52% of consumers 'often try to persuade others that the environment is important', indicating the strength of opinion associated with environmental concerns among a significant population.

The research also revealed that not all consumers are familiar with the term 'zero-carbon future' and others wanted to know more about how we could achieve this given its own impact on the environment through ordinary activities.

"I don't know how they can get a zero-carbon future. They are digging roads up and stuff and they'll need engines and machinery. I don't think it's all going to be battery operated"

(Domestic customer)

### Electricity in my Life Phase

Key insights	Customers and wider stakeholders expect us to lead by example – accelerating action to achieve net zero carbon emissions from our operations by 2038
	Three quarters (76 per cent) of people said they were either very or fairly concerned about climate change

During the 'Electricity in my Life' phase, and to build on the evidence base collected to date, four options for Electricity North West's business carbon footprint target for RIIO-ED2 were presented to its stakeholder Sustainability Advisory Panel.

In summary they were:

1. Option 1 - Net zero carbon emissions from Electricity North West's operations by 2050, to align with UK Government's legal target
2. Option 2 - Net zero carbon emissions from Electricity North West's operations by the midpoint between 2038 and 2050 to enable the realisation of local area ambitions on the timing of carbon neutrality
3. Option 3 - Overall carbon emissions from Electricity North West's operations reach net zero by 2050 and 2038 for operations within Greater Manchester
4. Option 4 - Net zero carbon emissions from Electricity North West's operations by 2038, to align with the end of RIIO-ED4 price control and start of the UK's seventh carbon budget.

The pros and cons of each option were debated by the Sustainability Panel with a view to making a recommendation for the target the company should adopt. Based on the four proposals presented, stakeholders were unanimous that option 4 was most appealing.

Some stakeholders asked why we had only included scope 1 and 2 emissions given the impact of scope 3 emissions. There was appetite among stakeholders for us to show leadership and go above and beyond Ofgem's current requirements.

In survey, stakeholders preferred option was tested with consumers as follows:

Attribute	Service level
Accelerate the reduction of carbon emissions from ENW's operations (e.g. depots, offices, equipment, and vehicles), currently equivalent to the carbon emissions of 1,400 households	Current: Net zero carbon emissions will be achieved by 2050
	Future: Net zero carbon emissions will be achieved by 2038

The proposal was ranked 9<sup>th</sup> against 23 competing initiatives, indicating broad appeal.

### Our Plan for the Future

Key insights	Customers want to see a concerted effort to reduce losses
	Proactively protecting overhead lines from trees rather than waiting for landowners to fulfil this role was perceived as important because “prevention is better than cure”.

In a cost themed meeting convened with the Plugged in Public Panel, members were presented with a series of potential activities, shown in Figure 10, that Electricity North West could invest in to improve environmental performance, including an indication of the likely impact on customer bills. Discussions within their breakout groups focussed on which they thought were most important for investment with 11 investments discussed, a sub-set of 32 proposals.

Panel members were given the chance to discuss each of the 11 options in small groups. They were asked to decide which would be their top two options for us to prioritise for future investment in improving environmental performance.

The proposal to proactively increase the capacity of the network represented the most material bill impact but was the most popular with 30% of the vote. However, the results also demonstrated that there is a clear role for investing more to reduce losses. Panel members felt this kind of ‘wastage’ should be reduced as far as possible.

Proactively protecting overhead lines from trees rather than waiting for landowners to fulfil this role was perceived as important because “prevention is better than cure”.

More than £1 on average annual bill	Tens of pence on average annual bill	A few pence on average annual bill
<ul style="list-style-type: none"> <li>• Proactively increase the capacity of the network to enable new technologies such as electric vehicles to connect</li> </ul>	<ul style="list-style-type: none"> <li>• Only buy electric vehicles from now on</li> <li>• Reduce the risk of oil leakage from some of our cables by replacing them early</li> <li>• Invest to reduce losses (electricity lost during transmission that needs to be paid for and has a carbon impact)</li> <li>• Move overhead lines underground in areas where they spoil the view</li> <li>• Install electric vehicle charging points in areas that don't have them</li> <li>• Reduce our own carbon footprint quickly by refurbishing our buildings and depots</li> <li>• Proactively cut dead or dying trees that may affect overhead lines instead of waiting for the landowner to do so</li> <li>• Share more of the cost of connecting renewable energy generation across all customers</li> </ul>	<ul style="list-style-type: none"> <li>• Improve biodiversity at our substations through planting schemes etc.</li> <li>• Extend the community energy fund to help community groups to develop local generation schemes</li> </ul>

Figure 10: Potential environmental activities presented to a Plugged in Public Panel

Overall there were some clear similarities in the early and post-discussion polling that took place, with the top three priorities remaining unchanged. The lowest ranked options from the table discussions also received similarly low support in the private voting:

- Reduce our own carbon footprint quickly by refurbishing our buildings and depots
- Improve biodiversity at our substations through planting schemes etc
- Move overhead lines underground in areas where they spoil the view.

There were, however, also some clear discrepancies with reducing the risk of oil leakage and extending the community energy fund receiving significantly more support in the private voting. These shifts can be accounted for by discussion that occurred during the meeting which focused on the damage an oil leak can have on the environment and the opportunity members had to question the presenters and discuss the benefits these initiatives could deliver with their peers.

In a subsequent environment themed meeting of the Plugged in Public Panel three environmental initiatives were presented and considered in the round to understand which, if any, the panel feel is most important and may require further engagement:

1. Reducing the environmental impact of oil leakage from cables
2. Reduce the environmental impact of cutting down trees
3. Move cables underground in areas of outstanding natural beauty.

Contextual information on the quantum of these activities and investments in ED1 was provided.

Subsequently, 69% of the panel said that doing more to reduce the impact of oil leakage from cables is important (ratings of 4 and 5 on a 5-point agreement scale) and only 9% indicated it was unimportant.

Comments from those who considered this an important action raised concern for the health and wellbeing of the natural environment and noted that whilst such action may be expensive, the probable cost – both financial and PR related – of remedial action further on down the line following on from an accident or incident would likely be much greater. The minority that said this is not a particularly important issue based this on information provided during Q&A with company representatives that revealed that only 2% of cables are affected by oil leaking annually, more thereby influencing a view that there are more important matters to focus on.

A greater proportion (78%) of the panel said that doing more to reduce the environmental impact when trees are cut down is important (ratings of 4 and 5 on a 5-point agreement scale) and only 8% indicated it was unimportant.

A significant number of members made a strong case for care (of trees and wider environment) and balance to be found between the need to cutback/prune some trees to protect the network and the importance of replacing trees given their value for wildlife, the ecosystem and as agents of carbon capture.

“Trees play an important role in the wildlife in this country, so whilst it is essential for the network not to be damaged from trees, there needs to be a balance that protects biodiversity.”

“When a tree is cut back, another should be planted as swiftly as possible.”

Fewer members (54%) of the panel said that doing more to put cables underground in areas of outstanding natural beauty is important (ratings of 4 and 5 on a 5-point agreement scale) and a greater proportion (24%) indicated it was unimportant compared to other propositions.

Electricity North West’s ‘direct environmental impact’ was ranked fifth most important thematic priority overall by the Plugged in Public Panel. Those members who did place value on Electricity North West reducing their environmental impact (business carbon footprint) tended to emphasise the urgency needed to tackle climate change and the responsibility of energy companies to play a leading role in this. Panel members acknowledged that while Electricity North West was taking some good action to reduce their environmental impacts, there is more that could be done. There was also

concern from some participants that the cost of reducing the company's environmental impacts should not fall on Electricity North West's customers.

### Sweating the Detail

*This section will be completed after our next round of engagement. Please do continue providing us with comments and we will ensure that the document is updated based on the feedback we receive.*

## 4. Sustainable Development Goals

The United Nations Sustainable Development Goals (SDGs) were adopted by all United Nations Member states in 2015. They provide the framework for peace and prosperity for people and the planet, now and into the future. There are 17 overarching SDGs, with various targets aligned to each goal.

Our EAP has been created with these SDGs in mind and we see particular synergies with five of these in terms of the environment.

SDG	ENWL alignment
 <p><b>7</b> AFFORDABLE AND CLEAN ENERGY</p>	<ul style="list-style-type: none"> <li>- Connect renewable energy to the network sustainably.</li> <li>- Drive energy efficiency through a resilient and reliable network.</li> </ul>
 <p><b>11</b> SUSTAINABLE CITIES AND COMMUNITIES</p>	<ul style="list-style-type: none"> <li>- Reduce the impact on air quality.</li> </ul>
 <p><b>12</b> RESPONSIBLE CONSUMPTION AND PRODUCTION</p>	<ul style="list-style-type: none"> <li>- Reduce waste generation.</li> <li>- Promote the circular economy within our supply chain.</li> <li>- Follow the waste hierarchy by promoting the prevention and recycling of waste, with recovery or disposal only used where there is no alternative.</li> </ul>
 <p><b>13</b> CLIMATE ACTION</p>	<ul style="list-style-type: none"> <li>- Net zero carbon by 2038.</li> <li>- Adopt science-based targets to reduce our direct and indirect carbon emissions.</li> <li>- Improve resilience of our network to climate change.</li> </ul>
 <p><b>15</b> LIFE ON LAND</p>	<ul style="list-style-type: none"> <li>- Reduce the biodiversity loss from our network operations.</li> <li>- Integrate ecosystem and biodiversity values into network planning.</li> <li>- Introduce measures to prevent the spread of pests, diseases and invasive species.</li> </ul>

## 5. Decarbonising Our Network

Decarbonisation of our network is pivotal if the UK government and local authorities are to meet their ambitions for a low carbon economy. In this section, we set out our vision, goals, commitments, and the associated benefits, for the RIIO-ED2 period to take steps towards the decarbonisation of our network.

### 5.1 Business Carbon Footprint

Our vision:

- To be a leader in the reduction of our business carbon footprint and to achieve net zero carbon by 2038



Figure 11: Electricity North West Limited Oldham depot

Our RIIO-ED2 goal:

- To make substantial carbon emission reductions during RIIO-ED2

The emissions of greenhouse gases from human activities that take place around the globe are unsustainable and urgent action is required to limit further and irreversible degradation of the environment that is brought on through accelerated climate change. As a distribution network operator, we play a key role in enabling the connection of low carbon electricity generation. However, we must also acknowledge and reduce the impact that our own operations have.



As part of our role in leading the North West to zero carbon, we have set an ambitious target to be net zero carbon for our own business carbon emissions by 2038. In order to realise this ambition, we have made a number of commitments.

In order to achieve our net zero goal, we will need to make both piecemeal and large steps. We believe this journey to decarbonisation will require the steps outlined in Figure 12.

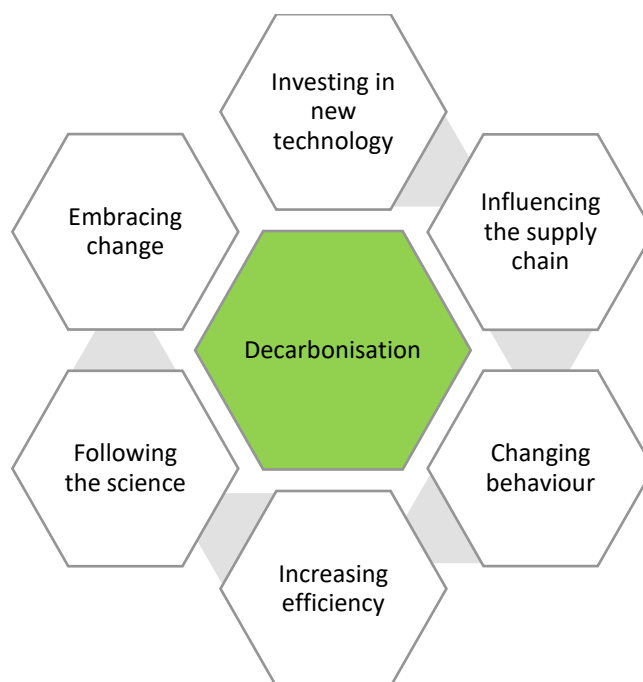


Figure 12: Steps to Decarbonisation

**Our commitments:**

- We will take meaningful steps to realise our goal of becoming net zero by 2038
- We will report annually our progress against our targets throughout RIIO-ED2
- We will achieve our BCF reduction target for RIIO-ED2
- We will show leadership by sharing our journey through case studies and communications to other businesses and stakeholders on their own decarbonisation journeys
- We will target an additional one depot per year in RIIO-ED2 to be a net zero carbon
- We will replace vehicles using internal combustion engines with electric vehicles once it becomes cost neutral or cost beneficial over the whole life cost

We will take steps to achieve our goal of becoming a net zero operator by 2038. This will require investments to take the journey from the present day to the end of 2038. To help us manage the investments required, we have divided our carbon budget between the price controls in this period, as shown in Figure 13. This budget may be revised following the development of science-based targets as shown in the next sub-section.

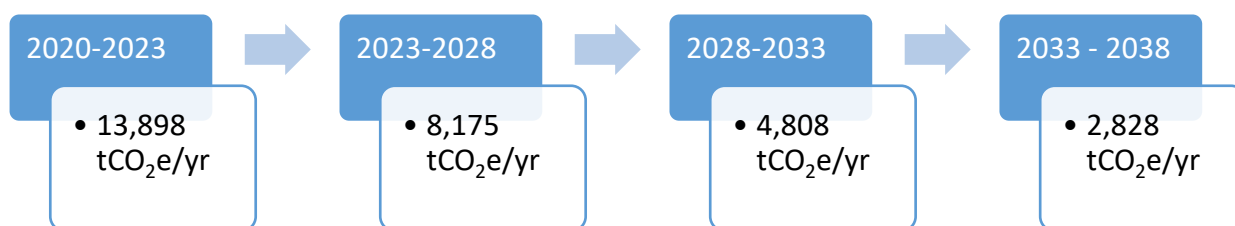


Figure 13: Carbon budget from 2020 – 2038

To be able to meet our net-zero target, we have already committed to taking actions such as:

Scope 1 emissions:

- Reduce our transport fuel emissions by moving towards cleaner vehicle technology for company-owned or leased vehicles.
- Develop a timetable to transfer our entire operational fleet over to electric vehicles.
- Ensure that there is enough charging infrastructure across our estate to facilitate electric vehicles.

Scope 2 emissions:

- Transform our entire estate to have onsite generation and storage to meet as much of our own energy demand as possible. This includes piloting the use of community owned energy on our sites.
- Use our certified ISO 50001 Energy Management System to create annual targets and objectives to improve our energy performance, at both a local and company-wide level.
- Continue to source our energy supply from a certified zero carbon source.

Scope 3 emissions:

- Encourage and support employees to choose electric vehicles for their own private vehicles.

**Benefits:**

- A reduction in greenhouse gas emissions and emissions of air pollutants
- Supports the development of low carbon, renewable energy generation
- A reduction in the consumption of non-renewable energy
- Evidential progression towards our net zero carbon 2038 goal

Business Carbon Footprint: Science-Based Targets

**Our vision:**

- To achieve net zero carbon by 2038 in line with a science-based trajectory

The 2015 Paris Agreement saw world governments commit to limiting global temperature rise to well-below 2°C above pre-industrial levels and to pursue efforts to limit global warming to 1.5°C. In 2018, it was recognised that limiting global warming to 1.5°C was the only way to prevent the worst effects of global warming.

Science-based targets (SBTs) are clearly defined pathways that show companies by how much and how quickly they must reduce their greenhouse gas emissions to prevent the worst effects of climate change.

**Our RIIO-ED2 goal:**

- To meet any milestones that fall within the RIIO-ED2 period as calculated in our SBTs

To avoid the worst effects of climate change, and to meet with our stakeholder’s expectations, we will set our science-based targets in line with a 1.5°C future. Further, we will present our targets to the science-based target initiative (SBTi) for official validation and disclose our emissions and track target process annually through our Annual Environmental Report.

**Our commitments:**

- We will identify, and subsequently monitor, metrics to track progress towards our science-based carbon reduction targets

There are five steps required to set a SBT, as shown in Figure 14.

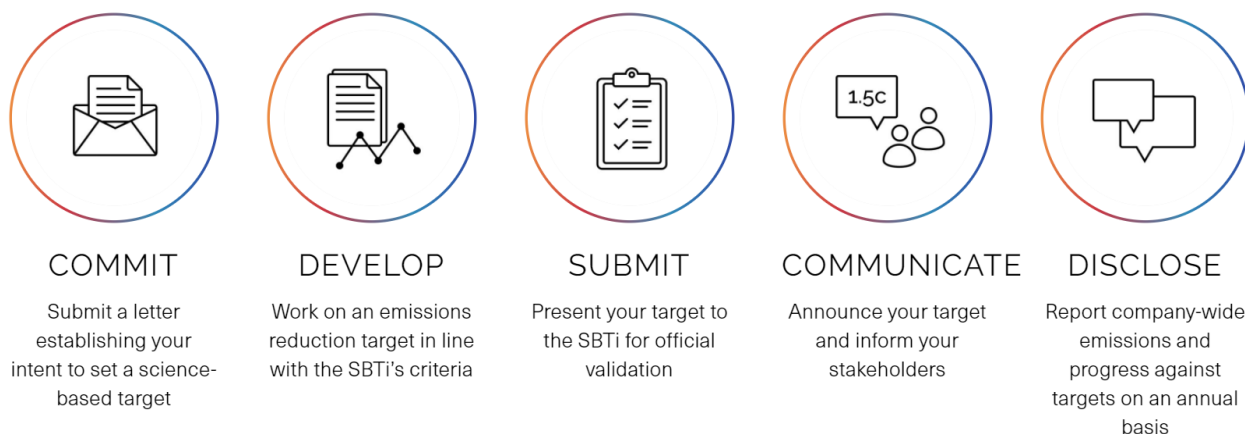


Figure 14: Steps to setting a science-based target

We have outlined the particular actions that we will take in order to meet these steps.

NB. Dates to be finalised but will be determined prior to draft business plan submission.

Step	Electricity North West actions
1 – Commit	We will submit our formal letter of intent to set a science-based target
2 – Develop	We will work with knowledge experts to produce targets for emissions reduction that are in line with the SBTi criteria
3 – Submit	We will submit our targets to the SBTi for official validation
4 – Communicate	We will communicate our targets to our stakeholders within one month of validation being provided by the SBTi
5 – Disclose	We will report on our company-wide emissions and progress against our SBTs on an annual basis through our Environmental Reports

**Benefits:**

- Contribution to limiting global warming to 1.5°C above pre-industrial levels
- A clear indication to our stakeholders of our commitment to reduce our business carbon footprint in line with scientific data
- A clearly defined pathway to the decarbonisation of our network

**Our vision:**

- To take responsibility for our major sources of Scope 3 emissions to maximise our positive environmental impact and to influence our employees and our supply chain to reduce their carbon footprint

Scope 3 emissions are indirect emissions that occur in a company’s value chain. This includes purchased goods and services, business travel, employee commuting, waste disposal, and transportation and distribution (up- and downstream). Although these emissions are not directly controlled by us, they are incurred as a result of our activities that are required to meet our customers’ needs. As an example, an item of switchgear is manufactured because there is a market for it, with Electricity North West being the market in this case.

Figure 15 demonstrates what is included within the scope 3 emissions.

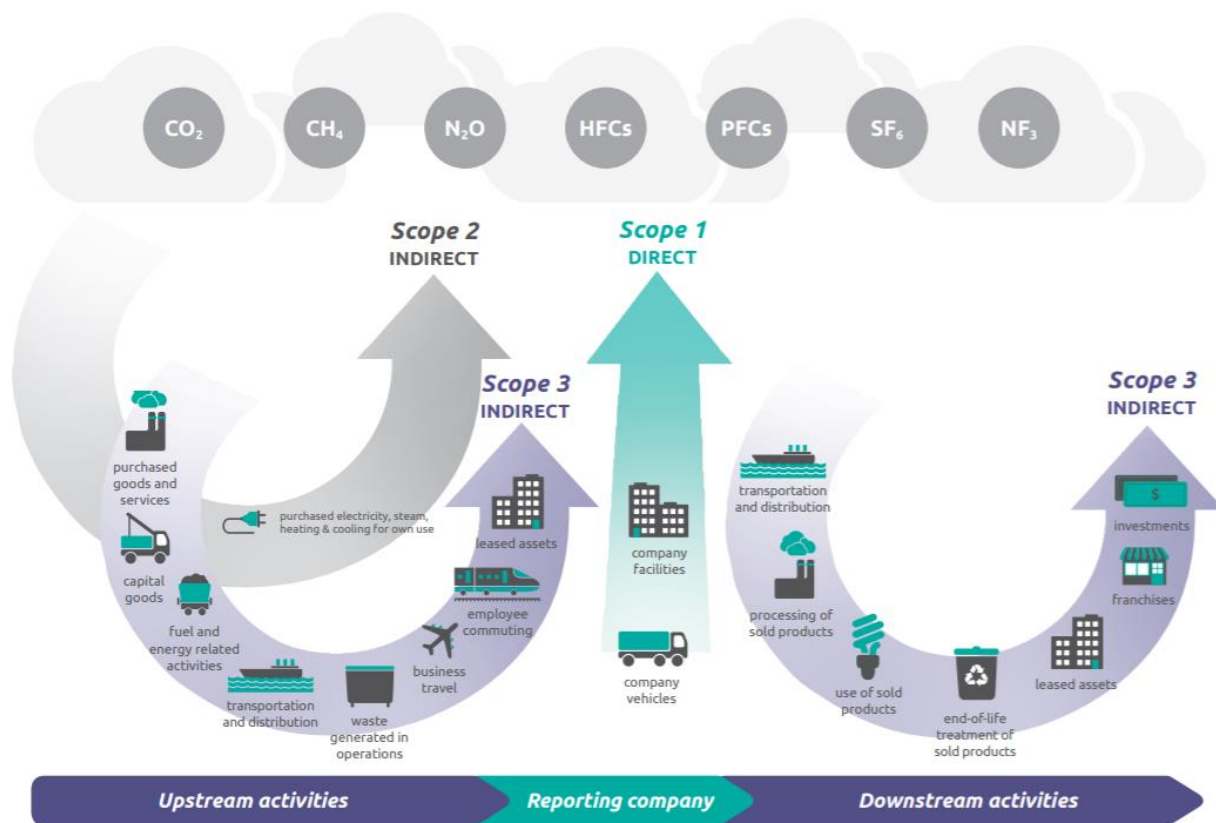


Figure 15: Scope 1, 2 and 3 greenhouse gas emissions

**Our RIIO-ED2 goal:**

- To reduce the indirect carbon emissions associated with our upstream and downstream value chain in line with science-based trajectories

We recognise that our current reporting of scope 3 emissions is not comprehensive and is not an accurate reflection of the amount of carbon emitted indirectly as a result of our network. Our stakeholders have also indicated that we must include more on scope 3 emissions or risk being left behind.

In order to influence the wider value chain and to reduce the associated emissions, we will create a scope 3 inventory of emissions. We will use credible knowledge experts to help to ascertain any emission hotspots with our supply chain. Once this inventory is known, we will follow the SBT criteria to establish the boundary of scope 3 emissions that should be included within our SBTs.

**Our commitments:**

- We will create a scope 3 emissions inventory
- We will identify those scope 3 emissions that provide the largest contribution to our overall business carbon footprint
- We will include the scope 3 emissions that are in this boundary in our SBTs

**Benefits:**

- A reduction in our overall indirect business carbon footprint

### Business Carbon Footprint: Innovation

At Electricity North West, we consider innovation to be a key enabler helping us to meet our broader objectives and to address the challenges facing the electricity industry, including net zero carbon objectives. The energy system transition is the change from energy use based on centralised sources using mainly fossil fuels to that based on decentralised sources and demands which are environmentally and socially sustainable.

## Net zero and the energy system transition

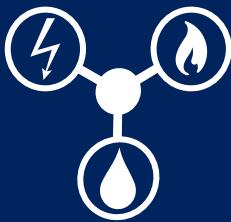
**Aim:** to facilitate and accelerate the UK's transition to net zero greenhouse gas emissions before 2050.



**How we will deliver:** as the UK continues to transition to net zero, the ways in which different customers use electricity and electrical networks will need to keep pace, resulting in significant changes in our network. We will manage the uncertainty associated with those changes through our innovation projects. We will carry out a carbon impact assessment for every innovation project, which will be published as part of our project registration document, and will only take on those which contribute to our net zero target.

## Whole energy system

**Aim:** to enable joined up and efficient approaches across multiple aspects of the energy system around planning, forecasting, design, construction, operation, maintenance and



**How we will deliver:** to ensure that we play our part in the energy system transition effectively, we will develop our understanding of how we impact on and interact with the wider energy system. We will collaborate on projects with other utilities, such as gas and telecoms, to ensure the best value for customers when transitioning to net zero. This will include new processes for standardisation and whole system co-ordination.

Examples of successful innovation projects that will support the transition to net zero are our Smart Street and CLASS projects.

### Smart Street

Our Smart Street project trialled innovative voltage control techniques to enable our networks and customers' appliances to perform more efficiently and make it easier to adopt low carbon technologies onto the electricity network.

Starting in 2020, we will install Smart Street technology at 180 distribution substations over a three-year period, targeting areas with a high uptake of low carbon technologies, particularly where these overlap areas of fuel poverty. This will bring benefits for up to 45,000 customers, reducing electricity consumption by 5-8% per year. In the longer term this rollout will save a massive 143,860 tonnes of carbon between now and 2050, the same as removing 2,570 cars from our roads every year.

## CLASS

Our CLASS project successfully demonstrated that by installing cutting edge voltage controllers in our primary substations we can reduce demand for electricity at peak times and defer reinforcement.

Since the successful completion of the project we have rolled out CLASS technology to 260 primary substations across the North West, benefiting 1.7 million of our customers. We are now able to provide 'balancing' services to National Grid, helping them to balance supply and demand for the whole of Great Britain.

CLASS will save customers in the North West around £100 million over the next 25 years – and £300 million across Great Britain.

## 5.2 Electricity Distribution Losses

### Our vision:

- To manage losses whilst maintaining a secure and resilient supply to our customers as we transition the network to net zero carbon

When electricity is generated in a power station, not all of the electrical energy which flows through the power network reaches the customer. This is because power networks, both transmission and distribution, use-up some of the energy in the process of transporting the electricity to customers. The energy used in transportation, known as losses, costs customers money and contributes to carbon emissions. These losses can be reduced in various ways but these measures also cost money. 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.

Our industry regulator, Ofgem, helps us to determine this balance by providing guidance on the value that we should place on saving losses when making its calculations. This includes some of the wider benefits which customers obtain through reduced network losses, such as lower carbon and greenhouse gas emissions.

Our future outlook as the UK transitions towards net zero carbon, sees a higher volume of renewable generation resources set to connect at the distribution level, where traditionally generation was connected at the transmission level in a passive one-directional system. This transition is set to increase the amount of current flowing in the distribution network which will impact technical losses negatively. However, failure to balance the promotion of renewables against appropriate losses management could result in the UK falling short on environmental commitments, hence economic prudence is required on the part of the DNO to temper this transition with appropriate losses management.

### Our RIIO-ED2 goals:

- Cost efficient network interventions which manage losses and contribute to the knowledge base, helping feedback into what we do for loss mitigation.

As part of our losses strategy, we have identified a number of priorities for managing both technical and non-technical losses. These priorities are summarised in Table 5.

Table 5: Summary of actions to manage losses

Investment	Actions	
<b>Technical losses</b>		
<b>Distribution transformers (ground-mounted)</b>	We will proactively replace old (pre-1990) large, ground-mounted, secondary network transformers with capacities of 800kVA and 1000kVA with the latest lower loss EU Eco transformers.	Proactive
<b>Primary transformers</b>	Whenever we are required to install or replace one of our primary transformers, we will aim to do so with a lower loss unit which complies with the latest European Union standard (EU Eco Design) specification.	Opportunistic
<b>Grid transformers</b>	Whenever we are required to install or replace one of our grid transformers, we will undertake a full, dedicated, project-specific assessment to determine the best type of transformer to install for the purpose of reducing losses. Where it is shown to be beneficial to do so we will install a lower loss transformer unit. All new transformers will comply, as a minimum, with the latest European Union standard (EU Eco Design) specification.	Opportunistic
<b>Distribution transformers (pole-mounted)</b>	Whenever we are required to install or replace one of our larger pole-mounted secondary network transformers, we will do so with a lower loss unit which complies with the latest European Union standard (EU Eco Design) specification where applicable and when the opportunity arises.	Opportunistic
<b>Cables (high voltage and low voltage)</b>	We will install large cross-section cables (300mm <sup>2</sup> ) at both high voltage (HV) and low voltage (LV) as standard – instead of the current mix of smaller (95mm <sup>2</sup> and 185mm <sup>2</sup> ) cables.	Opportunistic
<b>Non-Technical losses</b>		
<b>Transactional theft</b>	We will continue to work alongside suppliers to help reduce transactional theft – providing assistance where necessary.	Proactive
	We will also monitor and share best practice with other DNOs.	Proactive
<b>Theft in conveyance</b>	We will continue to develop our theft in conveyance services through the RIIO-ED1 period to ensure that we have the processes and reporting in place to ensure compliance with new Ofgem requirements.	Proactive
	We will contribute to the development of the National Revenue Protection Code of Practice to set out, in more detail, our activities associated with theft in conveyance.	Proactive
	We will increase the number of investigations undertaken through a more systematic approach to identifying cases. For example, we will follow-up with ‘potential customers’ who applied for a connection, but then didn’t complete the connection process	Proactive
	We will also monitor and share best practice with other DNOs	Proactive
<b>Unmetered supplies</b>	We will continue to undertake regular audits of the unmetered supply inventories to check for accuracy	Proactive
<b>Low Carbon Network Fund Strategy</b>		



LCN FUND	We will review and analyse the details of the Low Carbon Networks Fund (LCN Fund) innovation projects – particularly where valuable insights on the management of losses have been identified	Proactive
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We will also contribute to the knowledge base for best practice on losses management by reviewing several innovation projects currently ongoing within Electricity North West Limited. We will review their impact on losses management and the validity of delivering into a business as usual solution.

**Our commitments:**

- We will, through our interventions, deliver low loss replacements with industry standard Eco equipment and lower loss equivalents
- We will undertake the most efficient replacement of equipment on a proactive basis where economically advantageous
- We will opportunistically use low loss equipment when undertaking asset replacement due to health or network expansion

**Benefits:**

- Targeted and economically justified intervention will deliver costs benefits for our customers
- Manage carbon losses within our network

### 5.3 Sulphur Hexafluoride

**Our vision:**

- For 100% of our network assets to be free from SF<sub>6</sub> or other greenhouse gases

The use of sulphur hexafluoride (SF<sub>6</sub>) in the electrical transmission and distribution networks is widespread due to its excellent electrical insulation properties, as well as reducing equipment size and improving both safety and reliability. This is vital to help avoid fires and explosions to electrical switches and circuit breakers (switchgear) that could destroy equipment and facilities, take essential electricity supply to customers offline, and provide a serious safety risk to persons within the immediate vicinity.

SF<sub>6</sub> is a man-made and extremely potent greenhouse gas. Every kilogram of SF<sub>6</sub> that is released into the atmosphere is equivalent to 22,800 kilograms of carbon<sup>2</sup>. It also persists in the atmosphere for thousands of years. Fugitive emissions, or leaks, are relatively rare, but due to the high greenhouse gas potency have an environmental impact that is substantial relative to the scale.

The global warming impact of SF<sub>6</sub> is avoided by stopping leaks or mitigated by minimising leaks and acting promptly where leaks occur.

<sup>2</sup> <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2020>

#### Our RIIO-ED2 goals:

- To minimise fugitive emissions of SF<sub>6</sub>
- To minimise the increase in our SF<sub>6</sub> mass holdings

In keeping with the global desire to reduce greenhouse gas emissions, alternative switchgear technologies that are SF<sub>6</sub>-free are being developed. The degree of development varies with the application. If an alternative technology is available for an application, it has the potential to reduce SF<sub>6</sub> emissions but at the same time may cause other impacts on the electricity supply system. These include incompatibility with existing units or a larger weight or footprint, making replacement difficult or impracticable. Switchgear that is SF<sub>6</sub>-free is also more expensive; although costs are likely to be comparable with equipment containing SF<sub>6</sub> as the market matures, current supply of SF<sub>6</sub>-free equipment (where available) comes at a premium.

We will continue to use SF<sub>6</sub> switchgear until such time that the SF<sub>6</sub>-free solutions have been technically approved and are cost effective over the whole life-cycle. Whilst this market matures, our SF<sub>6</sub> mass holding may increase, i.e. new SF<sub>6</sub> switchgear installed on the network. There is also a risk that the process of replacing these assets earlier than end of life could lead to higher business carbon footprint emissions than necessary, particularly when considering embodied carbon, contradicting the net zero carbon ambitions. However, our aim is to minimise fugitive leaks of SF<sub>6</sub>.

We will take the following actions in RIIO-ED2:

- Install SF<sub>6</sub>-free equipment for our grid supply points.
- Repair leaks that are identified in an extremely timely manner.
- Use non-SF<sub>6</sub> primary switchboards at 11kV and 6.6kV voltage levels.
- Investigate new leak sealing technologies.
- Work with manufacturers and other distribution network operators to accelerate the availability of suitable and cost-effective SF<sub>6</sub>-free equipment.
- Collaborate with other electrical distribution and transmission operators with the aim of devising a strategy per voltage level.

#### Our commitments:

- We will collaborate with industry and manufacturers to accelerate the availability of cost effective alternative switchgear technologies that are SF<sub>6</sub>-free
- We will keep fugitive emissions of SF<sub>6</sub> from our network to below 0.3% of our total bank each year and review this target at the RIIO-ED2 midpoint
- We will proactively manage our equipment to minimise leaks
- We will replace SF<sub>6</sub> equipment if its condition deteriorates such that the integrity of the seals is beyond repair
- We will participate in relevant innovation projects
- We will develop a strategy to manage SF<sub>6</sub> equipment and respond to fugitive emissions

#### Benefits:

- A reduction in the fugitive emissions of SF<sub>6</sub>
- Progression towards our net zero carbon goal

## 5.4 Embodied Carbon

#### Our vision:

- To complete all projects and infrastructure on our network using the least amount of embodied carbon as possible

When we consider our carbon emissions, we recognise that these are not restricted to only the activities undertaken directly by ourselves. As an example, there is CO<sub>2</sub> or equivalent emitted in the production and supply of materials that are subsequently used by Electricity North West.

A significant reduction in the emissions that are associated with the operation of buildings and assets will be required to meet the UK net zero ambitions and the decarbonisation of the electricity network. It is likely that there will be an increasing focus on the amount of carbon that is embodied within building materials and assets.

#### Our RIIO-ED2 goals:

- Manage and reduce the embodied carbon within new projects during RIIO-ED2

Embodied carbon, also commonly referred to as embedded carbon, is the emissions that result from all the activities involved in the creation, use and demolition of a building or asset. It is the total life cycle carbon.

There are several stages within the life cycle where carbon emissions can occur. Figure 16, taken from BS EN 15978:2011, shows the building life cycle stages. The product stage, often referred to as 'Cradle to Gate' captures the carbon released in extracting the materials from the 'cradle', that being raw materials from the earth, transportation to manufacturing plants and in the manufacturing process itself. This is where the majority of emissions usually occur<sup>3</sup>, for which concrete commonly accounts for more than half.

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<sup>3</sup> Electrical distribution losses, which fall in the use stage, will be accounted for separately within the business carbon footprint

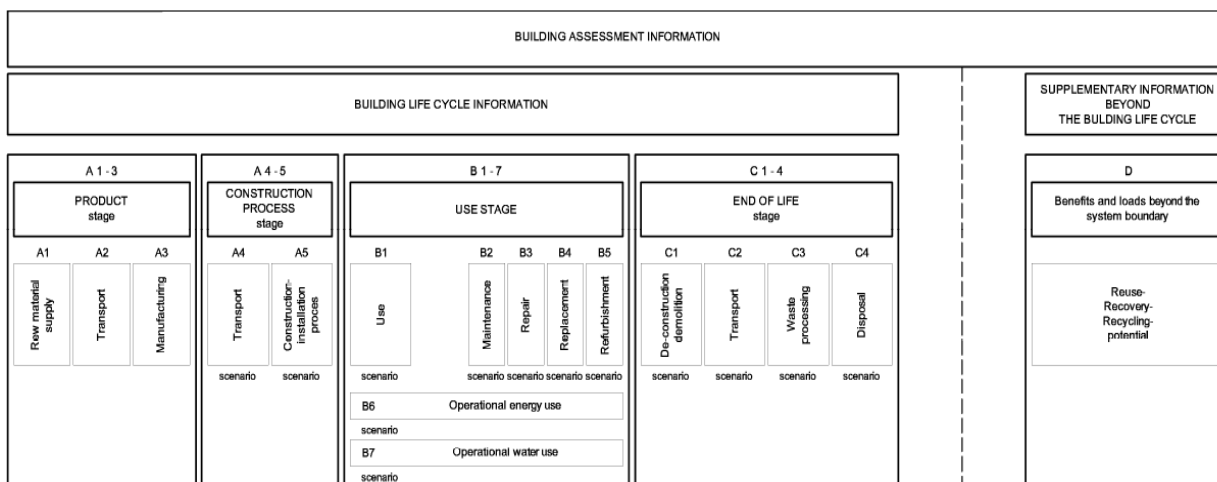


Figure 16: Building Life Cycle Stages

## Measuring embodied carbon

Accurate and reliable measurement of embodied carbon emissions can only be assured and reasonably compared through the use of accurate and reliable tools. In order to ensure that the embodied carbon that we measure and report on in RIIO-ED2 is directly comparable, we will develop or adopt an appropriate tool or software.

## Setting a baseline

By 2026, we will establish a true baseline for the embodied carbon within products that are material to our input. These include:

- Pole-mounted transformers (kg CO<sub>2</sub>e per tonne)
- Ground-mounted transformers (kg CO<sub>2</sub>e per tonne)
- Switchgear (kg CO<sub>2</sub>e per tonne)
- Wood pole (kg CO<sub>2</sub>e per metre)
- Overhead line cable (kg CO<sub>2</sub>e per kilometre)
- Underground cable (kg CO<sub>2</sub>e per kilometre)
- Link boxes (kg CO<sub>2</sub>e per unit)

Many of these items will have several sub-categories. For instance, a ground-mounted transformer will differ in the embodied carbon according to the voltage level and manufacturer. We will ensure that all relevant categories and sub-categories are included.

In order to make the biggest gains in carbon reduction, we will pay particular focus on the materials that result in the largest emissions, such as concrete and metal products. Within our baseline, we will measure the carbon intensity of these materials using an appropriate metric, such as kilogram of CO<sub>2</sub> equivalent per tonne or per kilometre.

We will also calculate the embodied carbon in typical new build and replacement substations on a kilogram of CO<sub>2</sub>e per m<sup>3</sup>.

## Targets

Once we have established a robust baseline, we will liaise with the supply chain to identify potential reductions in the embodied carbon of materials provided, whilst also optimising the design on new infrastructure projects.

We will target a reduction in the carbon intensity of products, such as transformers, and materials, such as concrete, used in our projects. We will set these targets once we have an established baseline and work with our suppliers to reduce the carbon intensity of their offerings.

### Supply chain

We recognise that as the electrical distribution network operator in the North West, we have a responsibility to lead and influence others to improve their environmental performance. We will introduce a mandatory requirement for our top 80% of suppliers (by value) to report on the embodied carbon for the materials and equipment that they provide to us by the mid-point of RIIO-ED2, where they are considered material to our operations. If material specific embodied carbon values cannot be provided, we will apply industry-recognised emission values

#### Our commitments:

- We will establish an appropriate tool for measuring embodied carbon
- We will set a baseline of the embodied carbon within materials and products that are material to our operations by 2026
- We will measure the embodied carbon in the 'cradle to gate' stage in a typical new substation build, in-situ substation replacement and streetworks activity
- We will report on activities to manage or reduce our embodied carbon within our Annual Environmental Reporting
- We will work with the supply chain to reduce embodied carbon in the network and set appropriate reduction targets

#### Benefits:

- A reduction in our overall business carbon footprint

## 5.5 Carbon Literacy

#### Our vision:

- To be corporately and individually aware of the carbon dioxide costs and impacts of everyday activities and the ability to reduce

No-one working for Electricity North West can be unaware of our net zero carbon ambitions and the investments and strides we are making to see this to fruition.

As a way of demonstrating this, we became a Carbon Literate Organisation<sup>4</sup> (CLO) to the bronze standard in March 2019. Carbon literacy is vital climate change learning that catalyses action to reduce greenhouse gas emissions. Today more than 40 organisations in the UK are carbon literate.

Electricity North West became the world's first 'carbon literate' power network operator after receiving a bronze accreditation from The Carbon Literacy Project in March 2019.

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<sup>4</sup> <https://carbonliteracy.com/>

Our carbon literacy bronze award recognises our increased commitment to acting on climate change, supporting colleagues to take action and share knowledge and best practice around carbon literacy within the sector and region.

As part of our work to promote carbon literacy, we have developed a training programme for colleagues which is an essential part of raising awareness and helping us to achieve our plan to lead the North West to net zero carbon.

The training will help motivate our colleagues to reduce carbon emissions on an individual, community and organisational basis and will help our business achieve silver accreditation.

#### Our RIIO-ED2 goals:

- Achieve the Carbon Literacy Organisation Gold standard

We are currently working towards the CLO Silver award whereby a minimum of 15% of our workers will be certificate as carbon literate.

During RIIO-ED2, we will take this further by achieving the Gold standard, with aspirations to be on the pathway to the platinum standard.

#### Carbon Literate Organisation

A Carbon Literate Organisation (CLO) will typically experience decreased in-house energy and resource consumption, improved organisational profile, healthier and happier staff, a healthier working environment, a safer supply chain, lower variable costs, enhanced competitiveness, and reduced commercial risk.

CLO accreditation also demonstrates an organisation's corporate social responsibility in the clearest possible way.

#### Our commitments:

- We will ensure that a minimum of 50% of our workforce is Carbon Literate trained
- We will achieve the Carbon Literate Organisation Gold standard during RIIO-ED2



**Benefits:**

- A carbon literate workforce with the knowledge and understanding of how their actions can contribute towards climate change

## 6. Reducing the Wider Environmental Impact of Network Activity

As shown throughout this EAP, we need to ensure that we reduce the wider environmental impact of network activity. In this section, we set out our vision, goals, commitments, and the associated benefits, for the RIIO-ED2 period to take ensure we reduce our impact on the environment and enhance the world around us where possible.

### 6.1 Supply Chain Management

#### Our vision:

- To be leaders in standards of environmental management, to influence our supply chain to follow the same path, and to engrain this in our procurement approach

The environmental impact of the supply chain can be vast. This can include resource extraction, energy consumption, greenhouse gas emissions, water consumption, the loss of biodiversity, and pollution. We recognise that we must take steps to influence our supply chain to address these environmental impacts, particularly as these impacts are as a direct result of our requirements to meet our customers' needs.

In order to influence our supply chain, we will use our procurement process to embed high standards of environmental management within the supply chain. We will continue to focus on carbon reduction and resource management.

#### Our RIIO-ED2 goals:

- To embed high standards of environmental management within our supply chain

Prior to RIIO-ED2, we will further develop our Supply Chain Charter to achieve a higher standard of environmental management within our supply chain. We will liaise particularly with our tier 1 and tier 2 contractors to influence and drive improvements. In order to ensure these high standards, we will undertake environmentally focused audits of some of our tier 1 and tier 2 suppliers throughout RIIO-ED2. We will report on the number of suppliers audited each year within our Annual Environmental Report.

Our stakeholders have indicated that our supply chain requirements must be proportionate to the materials or services being procured. For instance, it may be disproportionate to ask suppliers to report on the amount of carbon embodied within basic stationary items, whereas it would be apt when supplying 132kV transformers.

Our stakeholders have also indicated that our supply chain requirements must not become too much of a burden on SMEs. Therefore, we will introduce requirements to the supply chain in a phased approach so as not to overburden SMEs. We are currently working with third parties with relevant experience and expertise to develop our approach.

For instance, were data to be required on waste management, the initial phase, lasting from 2022-23, could be for us to outline future expectations and how we would gather the required information in advance of reporting it in RIIO-ED2. A second phase, lasting from the start of RIIO-ED2 to 2025, could be to report on total waste arisings and landfill diversion, with a final phase, commencing from 2025, to match or improve on our own landfill diversion and recycling targets.



In further recognition that smaller SMEs may be unable to fully meet the supplier code, the requirement will be for 80% of suppliers by value meeting the code rather than a blanket approach.

Table 6 provides an indication of the potential requirements of our supplier code in relation to environmental management.

Table 6: Potential supplier code requirements

Parameter	Supplier code requirements	Reporting requirement
Legislation	Comply with all legal requirements and obligations relevant to the environment	Number of environmental breaches and enforcement actions
Waste	Make reasonable efforts to reduce total waste arisings and to achieve zero waste to landfill	Total waste arisings and percentages of waste reused, recycled and sent to landfill
Resource use	Aim to focus on eco-design and think about the life cycle of products	Percentage of recycled content in materials supplied to ENWL
Business carbon footprint	Use recognised methods for calculating the business carbon footprint	Scope 1 and 2 business carbon footprint <sup>5</sup>
Embedded carbon	Use recognised methods for calculating the embedded carbon in materials	Amount of carbon embedded within resources supplied that are material to ENWL inputs

#### Our commitments:

- We will update and issue to suppliers that are material to our inputs a revised supplier code that requires high standards of environmental management by 2023
- We will adopt a target of more than 80% of suppliers (by value) meeting this code by 2025
- We will report annually on the percentage of suppliers meeting the supplier code, and work with those not meeting these requirements
- We will incorporate, where appropriate, higher standards of environmental management within tender evaluations

#### Tender evaluation

The standard of environmental management adopted within the supply chain will be evaluated in the tender process.

Where suitable, options available in the procurement and tender evaluation process include:

- Allocating a higher weighting for social value, including environmental management, within the procurement and tender evaluation.
- Requiring suppliers to provide an Environmental Product Declaration (EPD)<sup>6</sup> for products that are material to Electricity North West.
- The utilisation of take-back schemes at end of life.

<sup>5</sup> Potentially to be extended to include scope 3 emissions

<sup>6</sup> An Environmental Product Declaration (EPD) is an independently verified and registered document that communicates transparent and comparable information about the life-cycle environmental impact of products.

- The percentage of reused or recycled content in materials and products provided.

These evaluation criteria may be phased in so as to provide a lead-in time for suppliers to develop their processes and systems. For instance, an individual requirement may not be scored within the first year of implementation but by the end of RIIO-ED2 be assigned a 10% weighting of the overall evaluation.

Where appropriate, we will work collaboratively with our supply chain to develop their processes.

#### Benefits:

- Higher standards of environmental management within the supply chain resulting in reduced wider environment impacts

## 6.2 Resource Use and Waste

#### Our vision:

- To be responsible consumers of resources

The environmental impact of resource consumption can be vast. This can include the extraction of raw materials from the earth, the emissions created from processing it into a useable form, to the amount of water used for any cleaning processes required. The potential environmental impacts are shown in Figure 17.

## Results of resource demand

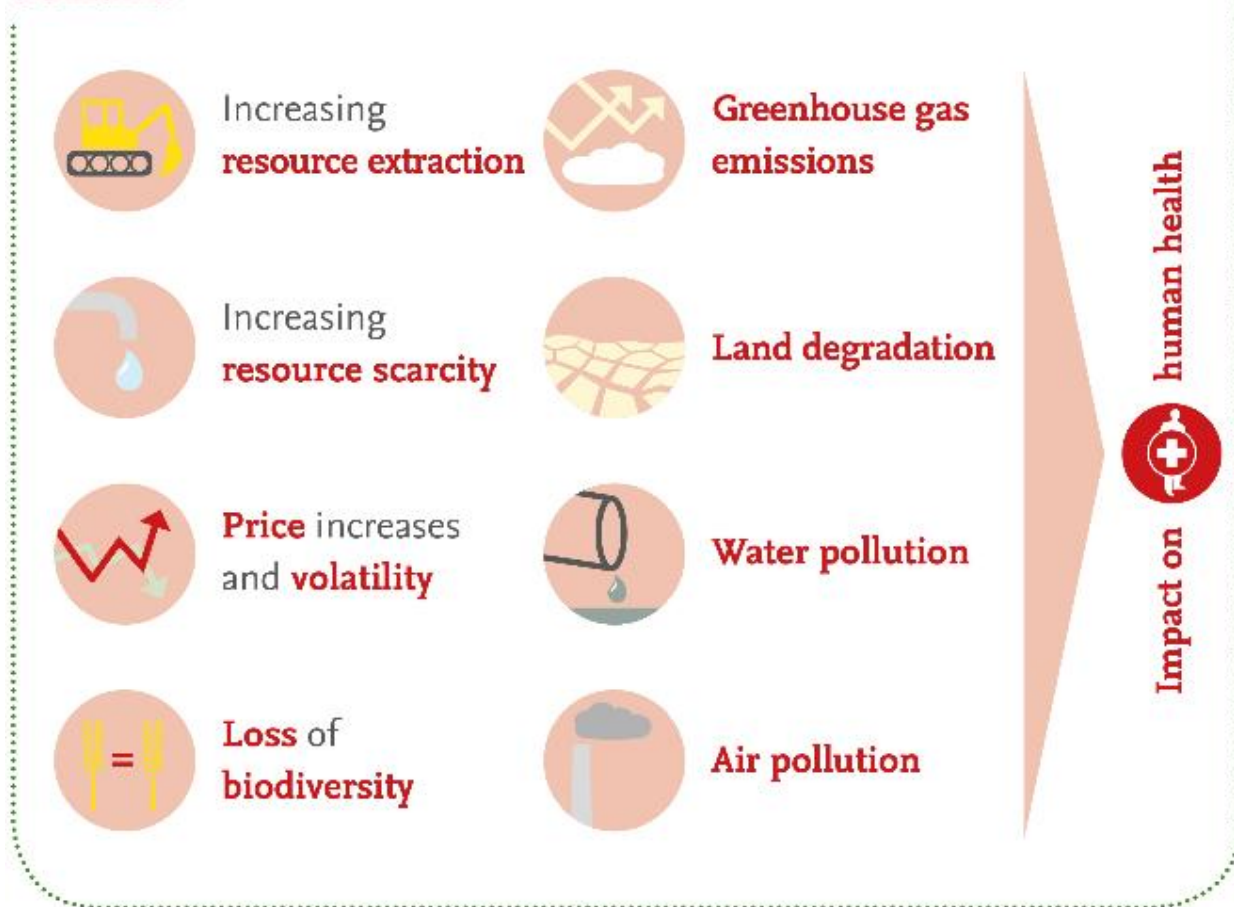
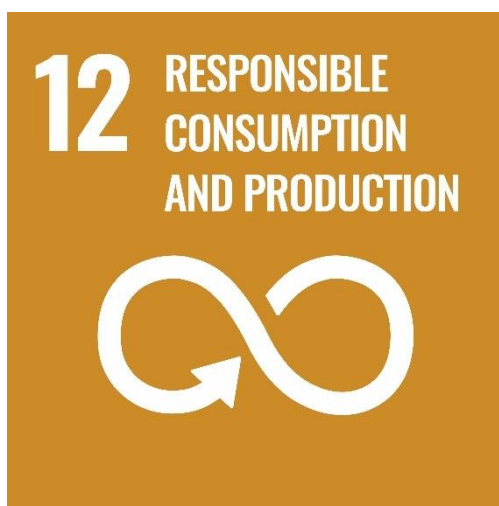


Figure 17: Environmental impact of resource use<sup>7</sup>

The United Nations has recognised the need for responsible consumption in goal 12 of their Sustainable Development Goals (SDGs).



Being responsible consumers means carefully balancing environmental impacts. For instance, replacing a piece of equipment that has the potential for fugitive emissions may not necessarily be the most environmentally-friendly solution. In this case, the associated embodied carbon of

<sup>7</sup> Source – International Resource Panel, United Nations <https://www.resourcepanel.org>

manufacturing and installing the new equipment could be worse for the environment when a better approach may be to deal with any leaks effectively.

#### Our RIIO-ED2 goals:

- Fully embed the circular economy concept
- Reduce our total annual waste arisings throughout RIIO-ED2
- Increase the recycled content within products we purchase

We will create a true baseline of our waste arisings in the final two years of RIIO-ED1. From here, we will set SMART targets for the reduction of total waste arisings and monitor progress throughout RIIO-ED2.

We will also embed the requirement for suppliers of products and materials that are material to our activities to provide information on the amount of recycled content within the products supplied.

#### Our commitments:

- We will update our procurement framework to increase the amount of recycled content that is material to our activities
- We will create a full baseline of our waste arisings prior to the RIIO-ED2 period
- We will understand the composition of our operational and office wastes throughout RIIO-ED2 to identify waste reduction opportunities

We will report on the progress of these commitments in our Annual Environmental Report during RIIO-ED2.

#### Benefits:

- Increased resource efficiency with a reduced environmental impact

### Managing Our Wastes

#### Our vision:

- To be a zero waste operator and further embed the circular economy model within our business

The consumption and disposal of products and materials has traditionally followed a linear economy, whereby raw materials are extracted, a product is made and used, before it is ultimately disposed. As most of these resources are finite there is an increasing move towards the circular economy model, whereby materials are made with reuse and recycling in mind, eliminating the need for raw materials.

In essence, the linear economy follows a 'cradle to grave' model, whereas the circular economy follows a 'cradle to cradle' model whereby waste and pollution are designed out, and products and materials are kept in use.

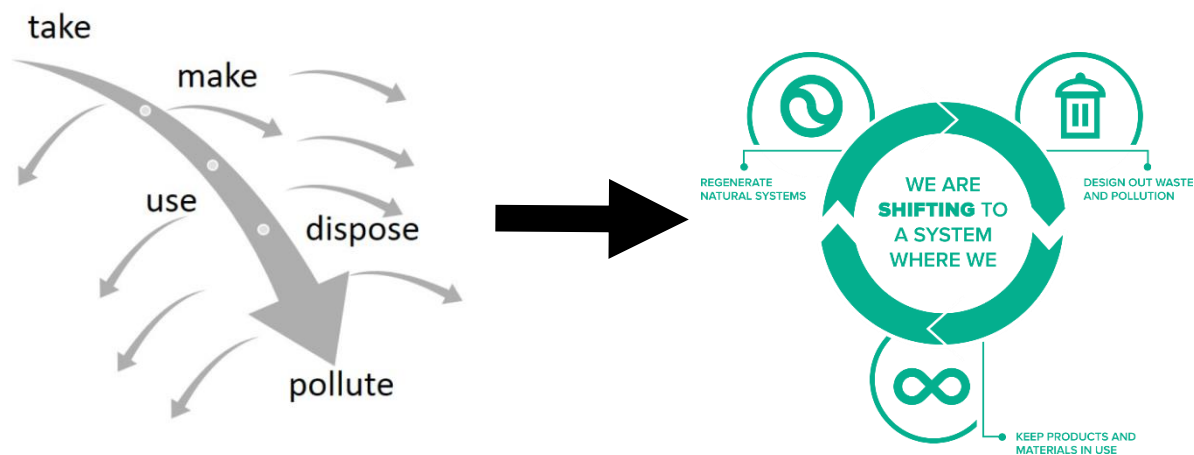


Figure 18: Linear and circular economy<sup>8</sup>

We wish to further embed the circular economy principle within our resource consumption and waste management activities.

#### Our RIIO-ED2 goals:

- Maximise the amount of waste that is reused or recycled

Efforts can be made to reduce total waste arisings.

As an example of our activities that we are already undertaking, we are extending the life of 33kV and 132kV transformers through targeted oil regeneration. This will result in a reduction of annual waste arisings as assets are not being replaced as soon as they would without this intervention.

#### Oil regeneration

Part of our approach to innovation is to maximise the use of our existing assets by using innovative interventions to prolong the life of electrical assets in our substations.

We are the only network operator with a dedicated oil reprocessing plant in the UK. Based at our Blackburn depot, the plant recycles 1.5 million litres of oil every year which is used to insulate and cool transformers.

Building on the success of our oil recycling process we pioneered a new, environmentally-friendly approach to regenerating oil which extends the life of our transformers. Our project demonstrated that recycling the oil in this way can extend the life of a transformer by 10 – 15 years. This new approach will save around £32 million over a six-year period.

As part of the next phase of research we are looking at the best time to carry out oil recycling in the life of a transformer.

However, there are challenges to waste reduction and recycling. In 2020 we issued over 180,000 face masks and 4,000 litres of hand sanitiser to our colleagues to keep them safe during the COVID-19 pandemic. Inevitably, this created waste materials that could not be readily recycled.

<sup>8</sup> Circular economy model diagram taken from the Ellen MacArthur Foundation

There are also some waste materials that cannot be recycled or recovered, such as asbestos from our substations. When we remove this asbestos in order to protect our colleagues, unfortunately it is sent for disposal in landfill.

Exceptional circumstances aside, we must identify opportunities and embed circular economy requirements within our business, through thought out specifications and discussions with suppliers for the assets we procure.

We will use the waste hierarchy, shown in Figure 19, to manage resources in a manner that is less detrimental to the environment, i.e. disposal to landfill as a last option.

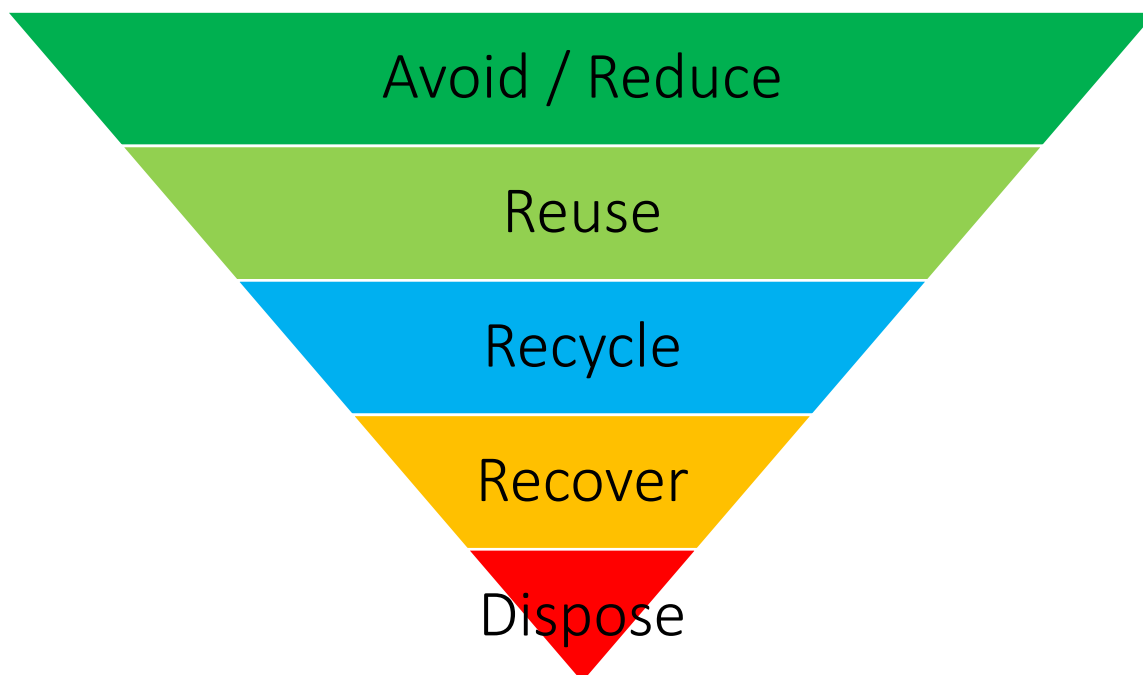


Figure 19: Waste hierarchy

Our current and potential options for waste management for typical wastes are shown in Table 7, using the colour coding shown in Figure 19. These are indicative only, as some wastes may fall across two different fates, e.g. some packaging will be recycled whereas some will be sent for energy recovery (waste to energy).

Table 7 also reflects the circumstances in which materials become waste. As an example, wood poles may be removed from the network due to storm damage and so would be unsuitable for reuse. Their creosote content makes them unsuitable for recycling, so energy recovery is the only viable option. Likewise, vegetation is removed around network infrastructure for safety reasons, so options to avoid this waste stream are very limited.

Nevertheless, Table 7 does demonstrate that there are potential opportunities to move some wastes further up the waste hierarchy.

Table 7: Current and potential waste management fate

Source	Typical waste type	Current fate	Potential fate
Offices	Kitchen waste	Recover	Recycle
	Packaging	Recycle	Avoid / reduce
	General / mixed waste	Recover	Avoid / reduce
	Electrical equipment	Recycle	Reuse
Depots	General / mixed waste	Recover	Avoid / reduce
	Waste oils	Recover	Recycle

Source	Typical waste type	Current fate	Potential fate
	Packaging	Recycle	Avoid / reduce
Overhead lines	Electrical equipment	Recycle	Reuse
	Wood poles	Recover	Recover
	Vegetation	Recycle	Reuse
Substations	Electrical equipment	Recycle	Reuse
	Asbestos	Dispose	Dispose
	Construction and demolition waste	Recycle	Reuse
	Insulating oil	Recycle	Recycle
Street works	Electrical equipment	Recycle	Reuse
	Excavated waste - hazardous	Dispose	Recover
	Excavated waste - inert	Recycle	Reuse
	Oil rags	Recover	Recover
Diffuse network locations	Vegetation	Recycle	Reuse
	Oil rags	Recover	Recover
	Electrical equipment	Recycle	Reuse
Vehicle workshops	Oil filters	Recover	Recycle
	Engine oils	Recover	Recycle
	Packaging	Recycle	Avoid / reduce

#### Our commitments:

- We will produce a resource strategy for RIIO-ED2 which will include strategies to reduce waste arisings and promote the waste hierarchy
- We will send zero avoidable waste to landfill by the end of 2025
- We will reuse or recycle at least 70% of our waste by the end of RIIO-ED2
- We will report on our waste arisings and management fate within our Annual Environment Reports
- We will eliminate unnecessary single-use plastics from our waste stream by the end of RIIO-ED2

Our waste management approach in RIIO-ED1 has been focused on ensuring that our practices are compliant. During RIIO-ED2 we will take this further by setting targets to maximise the amount of waste that is sent for reuse or recycling. This will necessitate collaboration with our key supply chain and ensuring that our colleagues have been given the appropriate level of knowledge and tools to follow our strategy.

To provide full transparency, distinction shall be made within our Annual Environment Report between the percentage of waste that is reused/recycled compared to the percentage of waste that is sent for energy recovery.

#### Benefits:

- A clearly trackable move towards zero waste

## Excavated Waste Arisings

### Our vision:

- To maximise the reuse and recycling of waste excavated for installation and repair and to divert 100% of this waste away from landfill

Emergency repairs and planned works on our network requires waste to be excavated from the ground. Traditionally, much of this waste has been classified as non-hazardous if no prior assessment has been carried out<sup>9</sup>.

The Environment Agency Regulatory Position Statement under which this occurs is reviewed regularly and will be withdrawn once an agreed strategy is finalised. We are working with other utility service providers to develop a protocol whereby all excavation wastes will be risk assessed for the likelihood of hazardous substances being present, such as hydrocarbons.

Under such a protocol, where indicators of potential hazardous substances are identified sampling and testing will be undertaken to determine whether the material should be classed as hazardous waste or otherwise. Where hazardous substances are found, this material would need to be remediated or disposed of to a hazardous landfill.

Although our vision is to reuse, recycle and divert 100% of the waste we excavate from the ground away from landfill, it is likely that some of the material will be hazardous and, therefore, our RIIO-ED2 goal is adjusted accordingly.

### Our RIIO-ED2 goals:

- Reuse or recycle at least 90% of our excavated waste arisings throughout RIIO-ED2

We will look for opportunities to reuse and recycle our excavated waste arisings and will implement any protocol that is approved by the Environment Agency for the assessment of this waste. Based on exploratory sampling of excavated waste that has been carried out by and for the utilities industries, we anticipate that most of this waste will be deemed to be non-hazardous. However, we cannot control what is found during any excavations.

Where indicators of hazardous substances are found, the sampling and testing will present an additional cost. Where this waste is then found to be hazardous, the treatment or disposal will add significant costs. At this stage, there is not enough confidence to provide appropriate costings for this disposal.

We propose having a re-opener once any new regulations have become operational and a robust sample of costs is available to provide accurate expenditure levels.

### Our commitments:

- We will implement any protocol that is agreed with the Environment Agency for the classification of excavated waste arisings
- We will report annually on the amount and percentage of excavated waste arisings that is sent to landfill

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<sup>9</sup> An Environment Agency Regulatory Position Statement has permitted that excavated waste from unplanned utilities installation and repair work can be classified as non-hazardous if it has not been assessed in line with the hazardous waste technical guidance (WM3)



The protocol is likely to include requirements for operating procedures and appropriate levels of training for colleagues carrying out relevant excavations. Once this is determined, we will implement the protocol requirements and work with our relevant contractors to ensure that all excavated waste is appropriately assessed and treated accordingly.

**Benefits:**

- Identification of hazardous substances from excavated waste
- The reuse and recycling of waste not containing hazardous substances, resulting in the elimination of the need to use virgin material

### Water Consumption

**Our vision:**

- To be responsible consumers of water

Water is a precious resource that is often taken for granted in the developed world. The impact of climate change and the resultant extreme weather is resulting in water supplies being less stable.

**Our RIIO-ED2 goals:**

- To be responsible consumers of water

Our use and consumption of water is largely dominated by domestic purposes in our offices and depots, as well as for cleaning vehicles within our depots. We will look to form a baseline of the volume of water that is used in our offices and depot environments and seek to understand where consumption is high.

**Our commitments:**

- We will target a year on year reduction in water consumption, normalised against levels of staff

We will use this baseline data to establish metrics such as the volume of water used per office occupant. Using this data, we can establish offices or depots that have a higher level of water consumption and use targeted technologies or education to make measurable reductions.

We will include this within our resource strategy.

**Benefits:**

- A reduction in the volume of water consumed

### 6.3 Biodiversity and Natural Capital

**Our vision:**

- To have a positive impact on biodiversity and natural capital in all projects and work that we carry out on our network

The importance of natural capital and biodiversity and the rate of loss of vital habitats have been recognised by the UK government. They are set to introduce a mandatory requirement for relevant planning approvals for biodiversity net gain within the Environment Bill.

We have also recognised the importance of biodiversity; enhancing biodiversity and ecosystems is a goal under the 'our environment' strand of our responsibility framework.

We recognise the role that we play in maintaining our sites responsibly and our role in managing the change to biodiversity and ecosystems on the land impacted by our network operations.

Much of our work to date in this area has been ad-hoc and we do not have robust data on biodiversity and natural capital across our land holdings. However, we have a Biodiversity Steering Group that meets monthly and consists of members of the executive and senior leadership teams, grounds maintenance teams, regulatory managers, and policy and environment managers.

In 2019 we selected nine substations sites across our region to receive a biodiversity makeover as part of a new 'Transforming our Spaces' project. Identified by our own grounds and maintenance teams, our colleagues saw an opportunity to improve the land around our substations and in turn improve the biodiversity and ecosystem of that area as well as their appearance to local residents. All nine sites received a makeover including wildflower planting, flower beds, installation of bird feeders, herbs and bug hotels. These sites are in the heart of local communities and are maintained in partnership with local groups.

The work also supports our biodiversity priorities with plants and wildflowers to help reverse the national decline in pollinating insects, by introducing wildflower seed mixtures containing the best species for pollinators while also delivering high visual impact. We have observed an 85% success rate in transforming these sites into low-maintenance, self-pollinating, attractive spaces.

The coronavirus pandemic saw plans for wildflower planting at further sites postponed. However, we hope to get these back on track as soon as possible.



Figure 20: Wildflower scheme at a substation, Bolton

## Our goals:

- Achieve a 10% net gain on new projects from 2025 onwards

In addition to any legislative requirements brought on through the Environmental Bill, we will continue to identify a number of sites each year throughout RIIO-ED2 for a net gain in biodiversity. We will conduct a baseline biodiversity assessment in line with a suitable tool and record the biodiversity following the intervention.

We will build further on the work undertaken in RIIO-ED1 and pilot this approach for the first two years of RIIO-ED2 before a review of the methodology and tools used. We will then set targets for the remainder of RIIO-ED2 with a minimum aim to achieve a 10% net gain on new projects, defined as the sites identified above and any project that falls under the remit of the Environment Bill requirements.

In order to enable resilience and safety on our network, tree pruning or felling is an essential role we carry out. As a means of compensating for this, we will plant one tree for every day of each of the five years of RIIO-ED2 to ensure a positive impact on the environment.

### Biodiversity enhancement – a case study

Felling trees adjacent to overhead power lines may not seem a particularly obvious way of enhancing overall **biodiversity**. However, at a site near to Whaley Bridge in Derbyshire this has indeed been the case.

Trees and scrub within the vicinity of the overhead network were recently cleared for safety and supply purposes there, and although the impact on the landscape may have initially appeared dramatic, the results for wildlife have been positive.

Removal of the immediate tree layer surrounding the lines has allowed greater levels of light and warmth to reach the ground, resulting in an explosion in the population of wildflowers.

The wildflowers and low scrub layer within the corridor are providing an important food source for invertebrates, such as butterflies, moths and pollinators such as bees.

The insect population also acts as prey for predators such as birds, helping to support a healthy local ecosystem.

## Our commitments:

- We will ensure that biosecurity measures are followed to stop the spread of pests and diseases, as well as limit the proliferation of invasive non-native species
- We will adopt an appropriate tool to assess the natural capital and biodiversity
- We will spend approximately £600K per year for biodiversity initiatives
- We will continue to identify a number of sites per year for biodiversity enhancement and achieve a minimum net gain of 10% on each site from 2025
- We will identify and subsequently monitor and report annually, appropriate metrics by which to baseline and track levels of biodiversity
- We will plant one tree for every day of RIIO-ED2 to ensure a positive impact on the environment

In addition to our work at our substations, we continue to manage and identify invasive species at our sites for the safety of our environment, infrastructure colleagues and customers. Across our properties and network, there will occasionally be invasive non-native species (INNS) which can cause problems for native species and reduce biodiversity. We will continue to train and support operational colleagues on the identification of such INNS and actions to be taken, through the continued implementation of our Biosecurity Code of Practice.

As part of our work with vegetation management, where possible we encourage customers to retain arisings. This helps provide habitats for wildlife, eliminates removal of any nutrients from the area and reduces risk of spreading disease. If we do remove arisings from locations, our second preference is to donate to local charities such as animal refuges or donate to schools for natural areas.

#### Benefits:

- Enhancement of the biodiversity around our network assets

## 6.4 Fluid-Filled Cables

#### Our vision:

- To remove all fluid-filled cables from the network by 2047

A significant part of our distribution network was constructed in the 1950s to 1970s. Fluid-filled cables were installed in this time. The fluids found in the cables are either mineral naphthenic oil, linear alkylbenzene, or a mixture of the two. The fluid is used as an insulator in 133kV and 33kV cables and must be kept under constant positive pressure to maintain the integrity of the electrical circuit.

The percentage of cables on our network that contain these harmful fluids is low, accounting for well below 1% of total cables. In turn, only a small percentage of these cables develop leaks. However, oil is a toxic substance and has the potential to significantly harm the environment when leaks occur. Therefore, our long-term vision is to remove all these cables from service and replace them with alternative cables that do not contain fluids or oils. We have not installed new fluid-filled cables for several decades.

The majority of our fluid-filled cables are found in the southern part of our network, with no cables within the boundaries of the National Parks that we operate in.

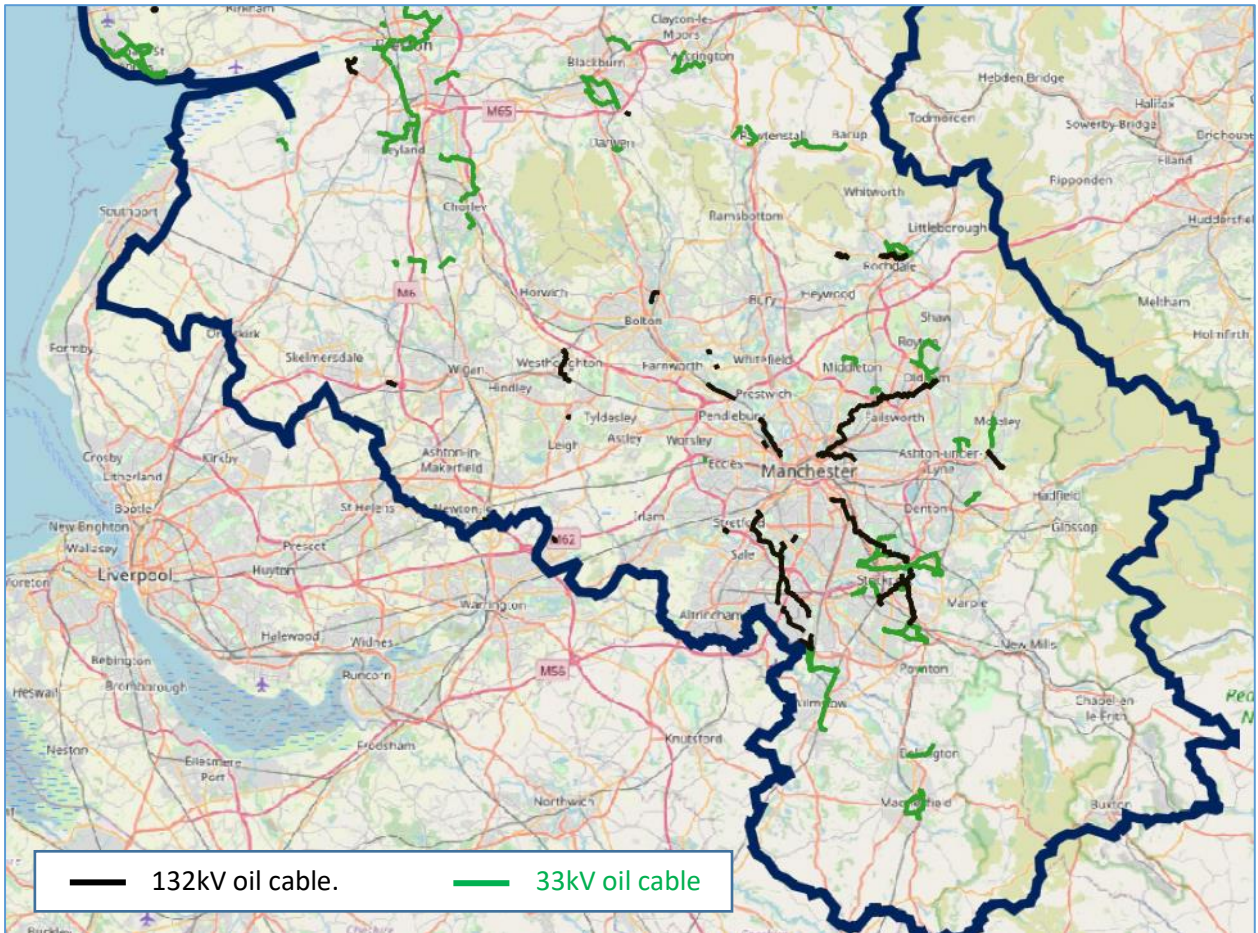


Figure 21: High-level map of the fluid-filled cables within our network

**Our RIIO-ED2 goals:**

- To minimise the pollution caused through leakage from our fluid-filled cables

During RIIO-ED2, we will remove a further 72km of fluid-filled cables, a reduction of around 15% of our current holdings.

Inevitably, some of these cables develop leaks. Leaks 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.

We will continue to use sophisticated leak detection measures to identify cables that are leaking, including dosing further circuits with a trace element during RIIO-ED2. We will reduce our leakage rate to no more than 25,000 litres per year throughout RIIO-ED2; a 15% reduction on the RIIO-ED1 target.

**Our RIIO-ED2 commitments:**

- We will remove 72km of fluid-filled cables that are at the highest risk from leaking from the network during RIIO-ED2
- We will maintain a leakage rate of less than 25,000 litres per year throughout RIIO-ED2
- We will report on progress against both targets in our Annual Environmental Reports
- We will initiate the remediation of land or water where contamination occurs

We will also continue to respond quickly to leaks and, where required, initiate the remediation of the environmental where contamination occurs. Where leaks do occur, we will act in accordance with the national operating code for the management of fluid-filled cable systems, a joint operating code drawn up between the Environment Agency and the Energy Networks Association Member Companies.

#### Benefits:

- Reduce the likelihood of environmental harm to receptors of fluid leaks

## 6.5 Undergrounding Cables

#### Our vision:

- To operate a network that is free from visual intrusion within National Parks and Areas of Outstanding Natural Beauty (AONB)

A significant proportion of our network, 12,600 kilometres, is made up of overhead lines. These can have a direct visual impact on the surrounding environment, particularly where the surrounding environment is within a naturally appealing landscape.

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:

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

Our long-term aspiration is to remove all overhead lines from these areas.

#### Our RIIO-ED2 goals:

- To remove the most visually intrusive overhead lines from National Parks and Areas of Outstanding Natural Beauty within our operating area

Any undergrounding activities will potentially require disruption to sensitive ground and will result in carbon emissions associated with the construction and demolition activities, so careful consideration needs to be given to the whole environment. There are other factors to consider, such as network resilience.

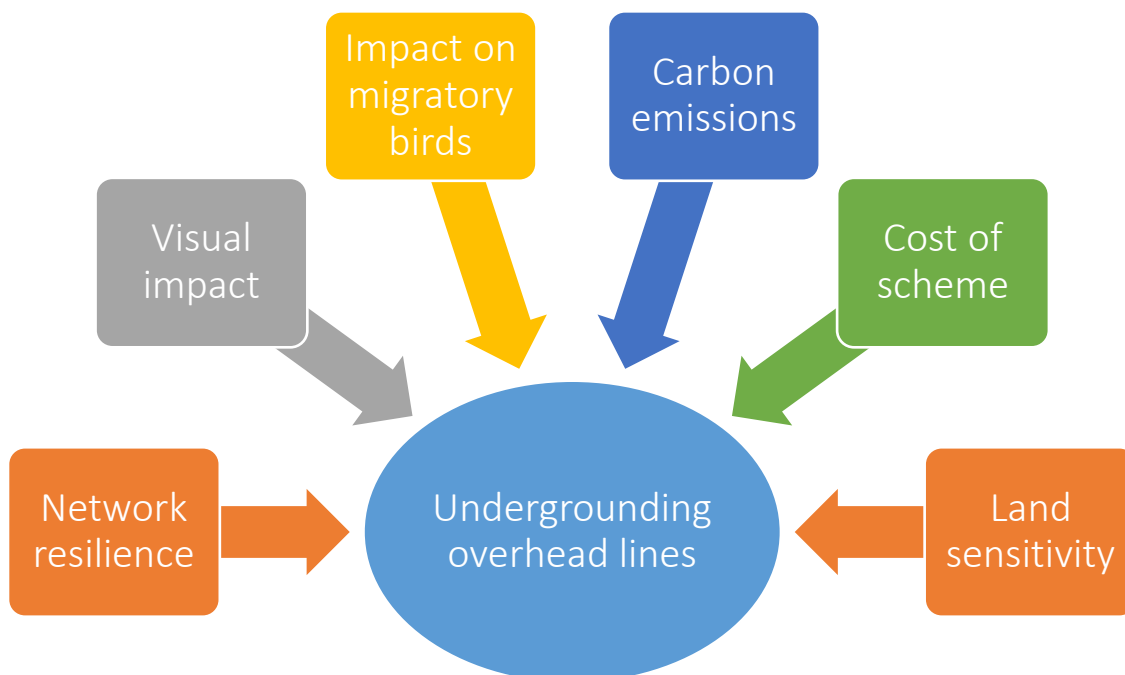


Figure 22: Factors to consider for undergrounding overhead lines

During RIIO-ED2 we will continue our programme from RIIO-ED1 to meet annually with representatives of the Designated Areas to identify the lines to be undergrounded in their area.

When we receive requests from the partners, we will assess lines for suitability for undergrounding based on the following criteria;

- Date of installation or major refurbishment of the line
- Any particular engineering difficulties to be overcome
- Land accessibility
- Areas of environmental or wildlife significance
- Archaeological sites
- Known land rights and consent issues
- Suitable routes for underground cable

Where supported by this stakeholder engagement and assessment, we will underground some of the most visually intrusive overhead lines each year during RIIO-ED2.

**Our commitments:**

- We will remove some of the most visually intrusive overhead lines and underground the cables in National Parks and Areas of Outstanding Natural Beauty each year in RIIO-ED2 where it is supported by stakeholder engagement and assessment



Figure 23: Impact of undergrounding cables in Arnside and Silverdale AONB

#### Benefits:

- Enhancing views and protecting the natural beauty of our National Parks and Areas of Outstanding Natural Beauty.
- This work also makes those parts of the network more resilient.

## 6.6 Noise Pollution

#### Our vision:

- To operate a network that does not create a noise pollution

Noise pollution is any unwanted or intrusive sound that has an effect on the health and well-being of humans or other organisms. Sounds that reach 85 decibels or higher can harm a person's ears and result in noise induced hearing loss; sounds that are below 85 decibels can lead to increased blood pressure, sleep disturbance and stress.

Sound can also have an impact on wildlife as animals can use sound to help navigate, attract mates, avoid predators or find food.

#### Our RIIO-ED2 goal:

- To act on any noise complaints received and to eliminate the nuisance

Some noise is inevitable within our operations. For instance, an electric humming sound around transformers is caused by magnetic fields which cause the transformers coils to expand and contract, whilst there is noise created during the excavation of ground to lay new cables or to undertake repairs to existing infrastructure.

We have already trialling the use of electric diggers which has two main benefits; firstly to reduce carbon emissions and secondly to reduce noise whilst operating.

We have also made requirements for noise reductions within our contract for the provision of generator services for the service provider to use the best practicable means to minimise noise and vibrations resulting from generator services. This includes providing acoustic panels where required. The contract also details requirements for noise reduction activities relating to the vehicles, plant and machinery used during the operations.



Table 8 shows common sources of noise from our operations, together with some of the potential noise reduction activities.

Table 8: Common sources of noise

Source of noise	Potential noise reduction activities
Temporary generators	Using quieter equipment; keeping equipment well maintained; using screens, barriers or enclosures
Substations	Using quieter equipment; using screens, barriers or enclosures; mounting equipment on acoustic dampening materials
Operational vehicles	Keeping vehicles well maintained; eliminating unnecessary idling; transition to electric vehicles
Street works, including excavations	Keeping vehicles and machinery well maintained; restricting works to daytime hours where possible; reducing duration of roadworks; using screens, barriers or enclosures; transition to electric tools and machinery

We will investigate all noise complaints that we receive that are directly linked to our activities. Where the complaint is substantiated, we will put in place actions to bring the noise to within acceptable levels.

**Our commitments:**

- We will record all complaints received for noise created by our assets or operations
- We will investigate all complaints that we receive for noise created by our assets or operations
- Where a noise complaint is substantiated, we will put in place actions to bring the noise to within acceptable levels
- We will report on any actions taken within our Annual Environmental Report

**Benefits:**

- A network that operates without causing a noise nuisance

## 6.7 NOx Emissions and Air Quality

**Our vision:**

- To eliminate emissions of NOx and other air pollutants from our operations

The UK government has recognised the various sources of air pollutants that can and do have an impact on local and more widespread air quality. These air pollutants are of concern to both public health, leading to impacts such as cardiovascular and respiratory diseases, and the environment, such as leading to a decrease in natural capital and biodiversity.

**Our RIIO-ED2 goals:**

- To reduce any impact that our network operations have on the air quality in the area in which we work

A particular area for concern is in the emissions and concentrations of nitrogen oxides, or NOx. NOx is made up of both nitrogen dioxide (NO<sub>2</sub>) and nitric oxide (NO). NOx is released into the atmosphere when fossil fuels are burned.

Other pollutants of concern are primary particulate matter (PM<sub>2.5</sub>), ammonia (NH<sub>3</sub>), volatile organic compounds (VOCs) and sulphur dioxide (SO<sub>2</sub>). With the exception of ammonia, all of these pollutants can be emitted from road transportation as well as other sources.

The UK has statutory obligations to keep concentrations of these pollutants below prescribed levels. The one pollutant that the UK is not meeting these limits is in relation to roadside nitrogen dioxide. As a consequence, the UK government has instructed many areas, including the Greater Manchester region, to develop Clean Air Plans to bring NO<sub>2</sub> on local roads within legal limits. Following a consultation, Greater Manchester is set to introduce a clean air zone from spring 2022. We anticipate more authorities within our area to introduce similar requirements.

Within the UK, road transport is by far the biggest contributor to NOx, accounting for around a third of total emissions (34%). Energy generation (22%) and emissions from other forms of transportation (17%) are also significant contributors to NOx emissions.

As a means of limiting of direct and indirect contributions to NOx emissions, we will adopt the following strategy for RIIO-ED2.

Source of NOx (national contribution)	Our actions
Road transportation	Limit the choice of company cars for business travel to fully electric vehicles (EVs) by the start of RIIO-ED2.
	Continue to discourage journeys that are not strictly required, particularly when alternatives such as virtual meetings can be used.
	Continue to encourage and incentivise employees to select fully electric vehicles for their own private vehicles.
	Replace fleet vehicles with cleaner technology when it is fully viable and cost neutral or cost beneficial.
	Increase awareness of good driving behaviours to prevent excessive fuel use.
	Continue to ensure our operational transport is well maintained and roadworthy at all times.
Energy generation	Continue to purchase electricity from 100% renewable sources
Other transportation	Avoid air travel unless unavoidable.

Most of the actions identified in the table above will also lead to reductions in emissions of SO<sub>2</sub>, VOCs and PM<sub>2.5</sub>. In addition, in order to limit the emissions of VOCs from our network, we will carry out the actions detailed below:

Source of VOCs	Our actions
Cleaning products	Ensure that only cleaning products that are free of VOCs are purchased and used on our premises
Oil storage and reprocessing	Continue to ensure that we do not exceed the emission limits specified in the Environmental Permit for our oil reprocessing facility

#### Our commitments:

- We will lead the transition to EVs in our region by identifying opportunities to decarbonise transport in our own business.
- We will phase out the use of petrol and diesel cars within our company leased cars
- We will encourage our employees to choose cleaner vehicles for private vehicles
- We will work with vehicle manufacturers to provide fully electric or hydrogen vehicles for our operational transport
- We will promote efficient driving for company vehicle drivers

#### Benefits:

- Cleaner air and reduced impact on health

## 6.8 Polychlorinated Biphenyls (PCBs)

#### Our vision:

- To operate a network free of PCBs which have the potential to significantly harm the environment and health

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.

PCBs were used in electrical equipment such as transformers as an alternative insulating fluid where fire resistance properties were required. Although the use of PCBs has been reduced greatly since the 1970s when legislation first sought to control their use and supply, it is recognised that PCBs still remaining in existing equipment pose an environmental threat.

They are highly unreactive and largely resistant to breakdown by acids, bases and heat. They are not very soluble in water, but are very soluble in fat and similar substances, and so can build up in animals. As PCBs bioaccumulate, concentration tends to be greater higher up in the food chain. They are particularly harmful to the marine environment.

#### Our RIIO-ED2 goals:

- Eliminate PCBs from our network

The Environmental Protection (Disposal of Polychlorinated Biphenyls and other Dangerous Substances) (England and Wales) (Amendment) Regulations 2020 require all PCB-contaminated equipment to be disposed of or decontaminated of PCBs by 31 December 2025. PCB-contamination is defined as a concentration of more than 50 parts per million (ppm).

Whilst never specified for use by the DNO's forerunner companies, it seems that unintentional contamination of insulating oil occasionally arose during the manufacturing process.

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 to either test or statistically determine (in conjunction with the EA and the other ENA member companies) the PCB content of all this apparatus and dispose of all those items that are PCB contaminated by 31 December 2025.

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 within our oil stocks.

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 transformers that are removed will be replaced with suitable equipment which will enable a zero-carbon future. For instance, pole mounted transformers that are removed in rural locations will be upsized where the biggest capacity constraints exist, rather than replaced on a like-for-like basis.

All PCB-contaminated equipment will be sent to authorised treatment facilities where the oil will be recovered and the metal components, principally scrap steel and copper, sent for recycling.

#### Our commitments:

- We will remove all PCB-contaminated equipment from our network by 31 December 2025
- We will contribute to the work of the Energy Networks Association PCB working groups to establish cohorts of transformers that are PCB-contaminated or otherwise
- We will submit data to the Environment Agency annually on the items of equipment on our network that are known to be or are potentially contaminated with PCBs
- We will submit data to the Environment Agency annually on the items of equipment that are contaminated with PCBs that have been removed from our network
- We will only reprocess insulating oils at our oil recycling facility if the PCB concentration is nil or below 10ppm

#### Benefits:

- A network free of the potential for PCB-contamination

## 6.9 Environmental Permits for Oil Storage and Treatment

### Our vision:

- To operate in complete compliance of our Environmental Permits

Electricity North West has Environmental Permits issued by the Environment Agency (EA) for the storage or treatment of electrical insulating oils. As sites holding an Environmental Permit, the EA carries out both planned and unplanned inspections. These may be routine or in response to a complaint or pollution event.

Our current Environmental Permits are shown in the table below:

Site	Permitted activity	Permit reference
Blackburn, CORD	Treatment of insulating oils	BP3038MZ
Kendal	Storage of insulating oils	AP3693ZT
Oldham	Storage of insulating oils	HB3733AG
Workington	Storage of insulating oils	AP3593ZG

The EA uses a Compliance Classification Scheme (CCS) to record any identified breaches of the Environmental Permit conditions during inspections of the site. If any breaches are identified, or any actual or potential environmental harm is found, the EA will record the breach and use the CCS system to assign a banding to the site based on its performance. A 'Band A' status indicates the site is performing well and has not breached its Environmental Permit in the last 12 months, whereas a 'Band F' status indicates that the site is a poor performer, is currently or highly likely to pollute the environment, and is at risk of environmental enforcement or having its Environmental Permit revoked.

Our year-on-year goal for our Environmental Permits is to adhere to all of the requirements and achieve Band A status.

### Our RIIO-ED2 goals:

- Zero breaches of our Environmental Permits throughout RIIO-ED2
- Achieve Band A status for all of our Environmental Permits throughout RIIO-ED2

Our aim is to always comply with the requirements of our Environmental Permits. Currently, individually qualified persons fulfil the technical competence requirements of the Environmental Permits. We will introduce and maintain a certified Competence Management System to ensure that all staff who could affect the performance are aware of the requirements and procedures associated with the Environmental Permit.

**Our commitments:**

- We will carry out regular internal inspections of our Environmental Permits to ensure that we are not harming the environment
- We will introduce prior to RIIO-ED2 and maintain throughout a Competence Management System to ensure that all staff who could affect the performance of the Environmental Permits are aware of the procedures that must be followed to adhere to the Permit requirement
- We will use a Technically Competent Manager as qualified by the Waste Management Industry Training Advisory Board (WAMITAB) to identify training requirements in relation to the Environmental Permit

**Benefits:**

- Zero environmental harm resulting from our Permitted operations

## 6.10 Employee Environmental Awareness

**Our vision:**

- To empower our colleagues with environmental impact awareness

We have many corporate goals relating to decarbonisation and the wider environmental impacts of our operations. To fully meet these goals, it is vital that our colleagues are aware of their individual environmental responsibilities, and how they, through their work for Electricity North West, can have an adverse impact on the environment.

As part of our ISO 14001 Environmental Management System, we are required to provide training on the environment and ensure that those working for us as aware of these potential impacts.

**Our RIIO-ED2 goals:**

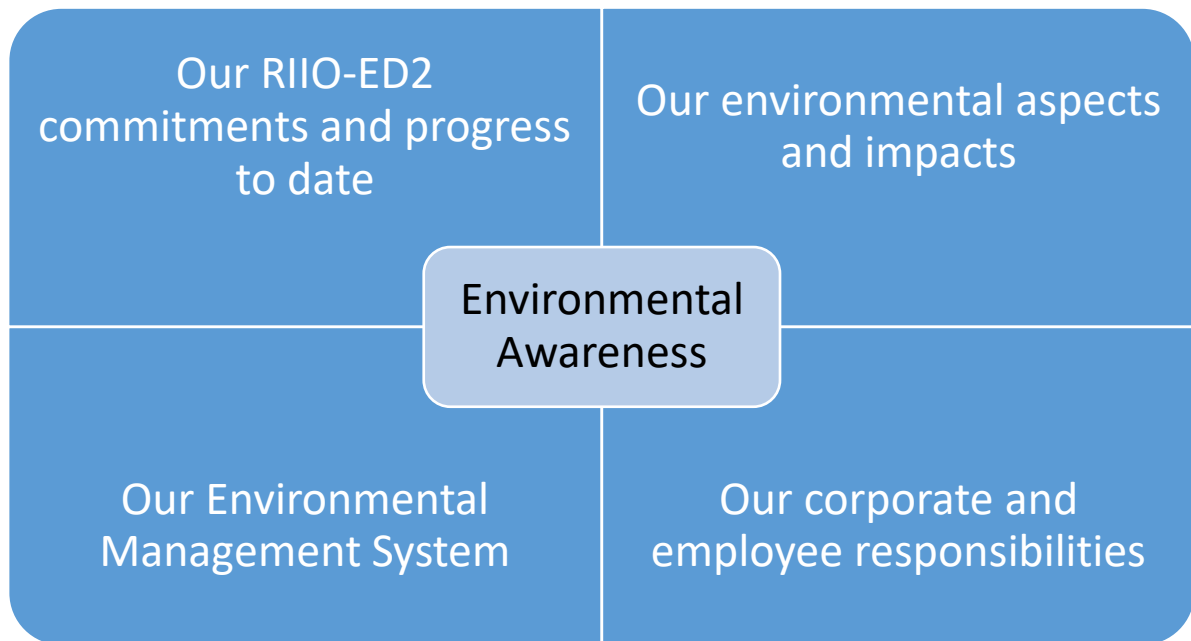
- Continued certification of our ISO 14001 Environmental Management System
- To further enhance environmental awareness through all parts of our organisation

We will further enhance the training we provide around decarbonisation and the environment. This will include promoting messages our corporate induction process, internal newsletters and communications, monthly toolbox talks and formal training courses.

**Our commitments:**

- We will include further information on the environment and decarbonisation within our corporate induction for new starters
- We will further incorporate environmental awareness through our internal communications
- We will deliver environmental awareness training to our Wider Leadership Team throughout RIIO-ED2 so that they can cascade this knowledge and influence their teams

We will create a training package to our Wider Leadership Team (WLT). The WLT will be responsible for ensuring that key messages are cascaded to their teams, supported by corporate communications. The training provided to the WLT will include:



**Benefits:**

- A workforce with a strong environmental awareness

## 7. Summary Of Environmental Action Plan Commitments

Our overall commitments were provided in Section 5 (decarbonising our network) and Section 6 (reducing the wider environmental impact of network activity). In this section, we provide an outline of the main factors and metrics to be reported on in the Annual Environmental Report.

We will produce an Annual Environmental Report in a format to be agreed with Ofgem. This will detail our progress against the activities and commitments outlined in the Environmental Action Plan.

Through the production of the Annual Environmental Report, we will be able to set stretch targets where we are on course to meet our overall objectives and identify where further actions are required where shortfalls are noted.

The Annual Environment Report shall be a publicly available document that we will publish on our website each year.

### Decarbonising Our Network

BCF

Metric to be reported - tCO<sub>2</sub>e

- Adopt a science-based target (SBT) to reduce our scope 1, 2 and 3 emissions in line with a net zero carbon future

BCF

Metric to be reported - tCO<sub>2</sub>e

- Reduce our business carbon footprint during RIIO-ED2 in line with our SBTs

BCF

Metric to be reported - number of depots

- Convert an additional depot or office per year in RIIO-ED2 to be net zero carbon

Losses

Metric to be reported - GWh reduction

- Reduce electrical distribution losses by 8 GWh per year

SF<sub>6</sub>

Metric to be reported - Percentage leaked

- Keep fugitive emissions of SF<sub>6</sub> from our network to below 0.3% of our total bank each year



**Embodied CO<sub>2</sub>** Metric to be reported - N/A

---

- Adopt or establish an appropriate tool for measuring embodied carbon

**Embodied CO<sub>2</sub>** Metric to be reported - Varies; see Section 5.4

---

- Set a baseline of the embodied carbon within materials and products that are material to our operations by 2026

**Embodied CO<sub>2</sub>** Metric to be reported - tCO<sub>2</sub>e per m<sup>3</sup>

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- Measure the embodied carbon in a typical new substation build

**Embodied CO<sub>2</sub>** Metric to be reported - tCO<sub>2</sub>e per m<sup>3</sup>

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- Measure the embodied carbon in a typical in-situ substation replacement

**Embodied CO<sub>2</sub>** Metric to be reported - tCO<sub>2</sub>e per m<sup>3</sup>

---

- Measure the embodied carbon in a typical streetworks activity

**Carbon literacy** Metric to be reported - Percentage of staff

---

- Ensure that a minimum of 50% of our workforce is Carbon Literate trained in RIIO-ED2

**Carbon literacy** Metric to be reported - N/A

---

- Achieve the Carbon Literate Organisation Gold standard during RIIO-ED2

**Supply Chain** Metric to be reported - Percentage of suppliers

---

- Adopt a target of more than 80% of suppliers (by value) meeting our Supplier Code by 2025

**Resource Use** Metric to be reported - Tonnes / Percentage

---

- Calculate our annual waste arisings and produce reduction targets

**Resource Use** Metric to be reported - Percentage

---

- Send zero avoidable waste to landfill by the end of 2025

**Resource Use** Metric to be reported - Percentage

---

- Reuse or recycle at least 70% of our waste by the end of RIIO-ED2

**Resource Use** Metric to be reported - Percentage

---

- Reuse or recycle at least 90% of our excavated waste arisings by the end of RIIO-ED2

**Water Use** Metric to be reported - Litres used per staff

---

- Reduce water consumption year on year during RIIO-ED2

**Biodiversity** Metric to be reported - N/A

---

- Adopt an appropriate tool to assess natural capital and biodiversity

**Biodiversity** Metric to be reported - Number of sites

---

- Continue to identify a number of sites per year for biodiversity enhancement

## **Biodiversity** Metric to be reported - Number of trees planted

---

- We will plant a tree for every day of RIIO-ED2 to compensate for trees felled for network reliance and safety reasons

## **Resource Use** Metric to be reported - Percentage net gain

---

- Achieve a minimum net biodiversity gain on these sites of 10% from 2025

## **Fluid-filled cables** Metric to be reported - Kilometres removed

---

- Remove 72km of fluid-filled cables from our network by the end of RIIO-ED2

## **Fluid-filled cables** Metric to be reported - Litres of oil topped up

---

- Maintain a leakage rate of less than 25,000 litres per year throughout RIIO-ED2

## **Undergrounding cables** Metric to be reported - Kilometres undergrounded

---

- Remove the most visually intrusive overhead lines in National Parks and Areas of Outstanding Natural Beauty each year in RIIO-ED2

## **Noise** Metric to be reported - Number of complaints

---

- Record all complaints received for noise created by our assets or operations

## **Noise** Metric to be reported - N/A

---

- Report on any actions taken to reduce noise pollution within our Annual Environmental Report

## **PCBs** Metric to be reported - Number of items

---

- Report on number of items of equipment on the network that are PCB-contaminated

## **PCBs** Metric to be reported - Number of items

---

- Report on number of items of PCB-contaminated equipment that have been removed from the network

## Permits

### Metric to be reported - Number of breaches

- Receive no breaches of our Environmental Permits recorded by the Environment Agency

## Awareness

### Metric to be reported - Percentage of staff

- Provide environmental awareness training to members of our Wider Leadership Team

## Potential Environmental Impacts in RIIO-ED2 Without Intervention

Our RIIO-ED1 progress, shown in Section 2, has demonstrated clear improvement in our environmental performance, most notably the reduction in our direct business carbon footprint. Through extensive engagement, our stakeholders have told us that we need to continue this progression, target additional areas and accelerate improvements.

Throughout this EAP, we have outlined the actions that we will take during RIIO-ED2 to decarbonise our network and reduce the wider environmental impacts of network activity. Without such interventions, there are a number of potential impacts on the environment, shown in Table 9 below.

Table 9: Potential environmental impacts without RIIO-ED2 interventions

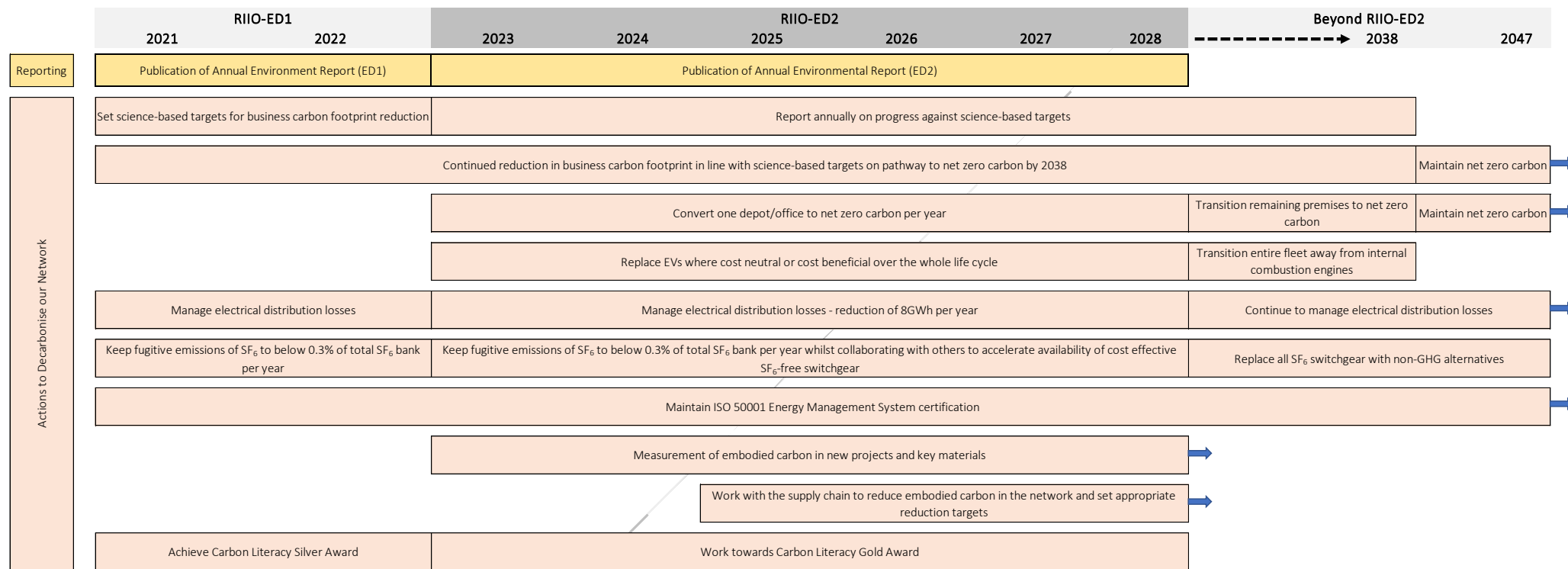
Action area and proposed target(s)	Potential impact in RIIO-ED2 without intervention
<b>Decarbonising Our Network</b>	
<b>Business carbon footprint</b>	
Adopt science-based targets (SBTs) to reduce our scope 1, 2 and 3 emissions	The creation of SBTs will provide a clearly-defined pathway towards our net zero carbon ambitions. Without adopting SBTs, there is a high likelihood that carbon emissions will reduce in a reactive manner rather than proactively. This in turn will reduce the speed at which emissions are reduced, resulting in a larger contribution to climate change during RIIO-ED2. It would likely require a larger amount of carbon offsetting, whereby the preference should be to reduce emission at source.
Reduce our BCF during RIIO- ED2 in line with our SBT	
Convert an additional depot/office to net zero carbon per year	
Replace vehicles using internal combustion engines with electric vehicles once it becomes cost neutral or cost beneficial over the whole life cost	
<b>Sulphur hexafluoride (SF<sub>6</sub>)</b>	
Maintain a leakage rate of below 0.3% of our total SF <sub>6</sub> bank	SF <sub>6</sub> is a particularly potent greenhouse gas. Although only a relatively small amount of this gas leaks, fugitive emissions make up almost a tenth of our current business carbon footprint. Assets that develop leaks and are beyond repair would result in high carbon equivalent emissions, contributing to climate change.
Replace SF <sub>6</sub> equipment if its condition deteriorates such that the integrity of the seals is beyond repair	
Develop and Implement a strategy to efficiently manage SF <sub>6</sub> assets	

Action area and proposed target(s)	Potential impact in RIIO-ED2 without intervention
<b>Electricity distribution losses</b>	
Manage losses, upgrading cables and equipment in areas of the network with the highest losses, reducing a total of 8 GWh of losses per year	The loss of enough electricity to power around 2,760 homes per year, with emissions of 2,264 tCO <sub>2</sub> e per year.
<b>Embodied carbon</b>	
Baseline the embodied carbon within materials and products that are material to our operations by 2026 and set targets for reduction for the remainder of RIIO-ED2	Potentially further contribute to climate change indirectly through the supply chain.
<b>Reducing the Wider Environmental Impact of Network Activity</b>	
<b>Supply chain management</b>	
80% of suppliers by value to adopt our enhanced Supply Chain Code to embed higher standards of environmental management	Without enhancing requirements around environmental management within the supply chain, the potential contribution to climate change, ground and water pollution, air quality and resource use could be unchecked and solely dependent on the supply chain to initiate.
Incorporate, where appropriate, higher standards of environmental management within tender evaluations	
<b>Resource use and waste</b>	
Produce annual targets for reductions in total waste arisings	A permant loss of resources, either through landfill or recovery as energy to waste, resulting in the continued extraction and use of virgin materials. Without setting reuse and recycling targets alongside landfill diversion targets, there is a risk that waste will be diverted to energy from waste facilities; although this does recover energy, it results in the need for the material to be replaced outright.
Send zero avoidable waste to landfill by 2025	
Reuse or recycle 70% of our total waste arisings by the end of RIIO-ED2	
Reuse or recycle 90% of our excavated waste arisings by the end of RIIO-ED2	
Eliminate unnecessary single-use plastics from our waste stream by the end of RIIO-ED2	
Target reductions in water use year on year	A failure to fully embed the circular economy principles which are vital if the earth is to be sustainable.
	Potential water scarcity should the worst impacts of climate change be realised.
<b>Biodiversity and Natural Capital</b>	
Identify a number of sites each year for biodiversity enhancement	The continued loss of natural habitats and biodiversity impacting on, as an example, pollinators and all plants and species that rely on them.
Target a biodiversity net gain of at least 10% per site from 2025 using a suitable tool	
<b>Fluid-filled cables</b>	
Remove 72km of fluid-filled cables that are at the highest risk from leaking to the environment	Pollution to ground and water if these cables deteriorate or are damaged, particularly as the system works on positive pressure where lost fluid is replaced with more oil, i.e. the cable will continue to leak.
Maintain a leakage rate of less than 25,000 litres per year throughout RIIO-ED2	
<b>Undergrounding cables</b>	
Remove some of the most visually intrusive overhead lines and underground the cables in National Parks and Areas of Outstanding Natural Beauty where it is supported by this stakeholder engagement and assessment	Visual intrusion in otherwise picturesque landscapes, impact on migratory birds, and reduced network resilience where the overhead lines are damaged by storms.

Action area and proposed target(s)	Potential impact in RIIO-ED2 without intervention
<b>NOx and Air quality</b>	
Lead the transition to EVs in our region by identifying opportunities to decarbonise transport in our own business	<p>If the current proportion of vehicles that run off an internal combustion engine (ICE) is maintained throughout RIIO-ED2, we will continue to emit existing levels of air pollutants such as nitrogen dioxide and sulphur dioxide, contributing towards poor local air quality. Our operations will also require us to travel through clean air zones, which will incur a charge for ICE vehicles entering such areas.</p> <p>Impacts on our business carbon footprint are also pertinent.</p>
Encourage our employees to choose cleaner, non-carbon vehicles for private vehicles	
Work with vehicle manufacturers to provide fully electric or hydrogen vehicles for our operational transport	
<b>PCBs</b>	
Remove PCB-contaminated equipment from the network by the end of 2025	Pollution the environment with persistent organic pollutants should any leaks occur, as well as the violation of the regulations requiring their removal.

## 8. Our Environmental Timelines

### Decarbonising our Network



# Reducing the Wider Environmental Impact of Network Activity

