Electricity Distribution

Annual Environment Report

2023/24

nationalgrid

Introduction

The energy sector is undergoing a period of exciting but significant change. The way we deliver this transformation across our regions matter, and it is clear to me that it has never been more important to act as a responsible business, rising to meet the changing expectations of our customers and society.

Our Annual Environment Report demonstrates how we turn this into action, finding better ways to deliver a positive impact for the environment, our people and the communities in which we work.

In our RIIO-ED2 Environmental Action Plan, we detailed our commitments to ensure that we remain a responsible and sustainable business throughout RIIO-ED2 and in the future.

We are performing well in all of our stated commitments and this our first Annual Environment Report for RIIO-ED2, I hope provides a clear, concise and informative view of our progress in these commitments to date.

The report also highlights areas where we face challenges, where we need to make improvements and where our activities are making a positive contribution to the wider communities in which we operate.

NGED are committed to delivering our commitments and making improvements in the way we manage our activities to ensure we remain a responsible and sustainable business for our customers, stakeholders, employees and local communities.

Yasharn Smith
Director of SHE
National Grid Electricity Distribution

2023/24 on a page

Protecting the Environment

- Improvements to our fluid filled cable management process and significantly reducing the impact on the local environment.
- Reducing our Business Carbon Footprint in line with our Science Based Target.
- Reducing the amount of waste which we send to landfill to 3.48%.
- Recertification of our company-wide ISO14001 environmental management system until 2026.
- Reducing the amount of PCB contaminated equipment which we have on our network.
- Working with manufacturers and trialling alternative switchgear equipment free from SF_6 – a potent greenhouse gas.
- Undertaking biodiversity surveys and developing biodiversity management plans at a number of NGED operational sites.

Improving Sustainability

- Engaging with our supply chain to better understand our Scope 3 carbon emissions and associated impact on nature and biodiversity.
- Aligning our activities to the UN Sustainable Development Goals (SDGs).
- Collaboration with our National Grid Group parent company in relation to submissions to the Carbon Disclosure Project (CDP) and the Task Force on Climate Related Financial Disclosure (TCFD).

Engaging with communities

- Formal collaboration agreement with the Heart of England Forest – improving community access to nature via supporting habitat management, biodiversity initiatives and planting trees in the heart of our licence area.
- Providing financial support and subject matter expertise to local community groups via the NGED Community Matters Fund.
- Delivering the first school solar installations, part of our commitment to invest £2.7m in community solar by 2028.
- Donation of decommissioned company tech to local community charities and schools.

Who we are and what we do

Every day National Grid Electricity Distribution brings energy to life for eight million customers in the South West, the Midlands and South Wales.

Our network in numbers:

1.4 million
towers and poles

141,000km
of underground cables

188,000
substations

90,000km
of overhead lines

Our main responsibilities to our customers

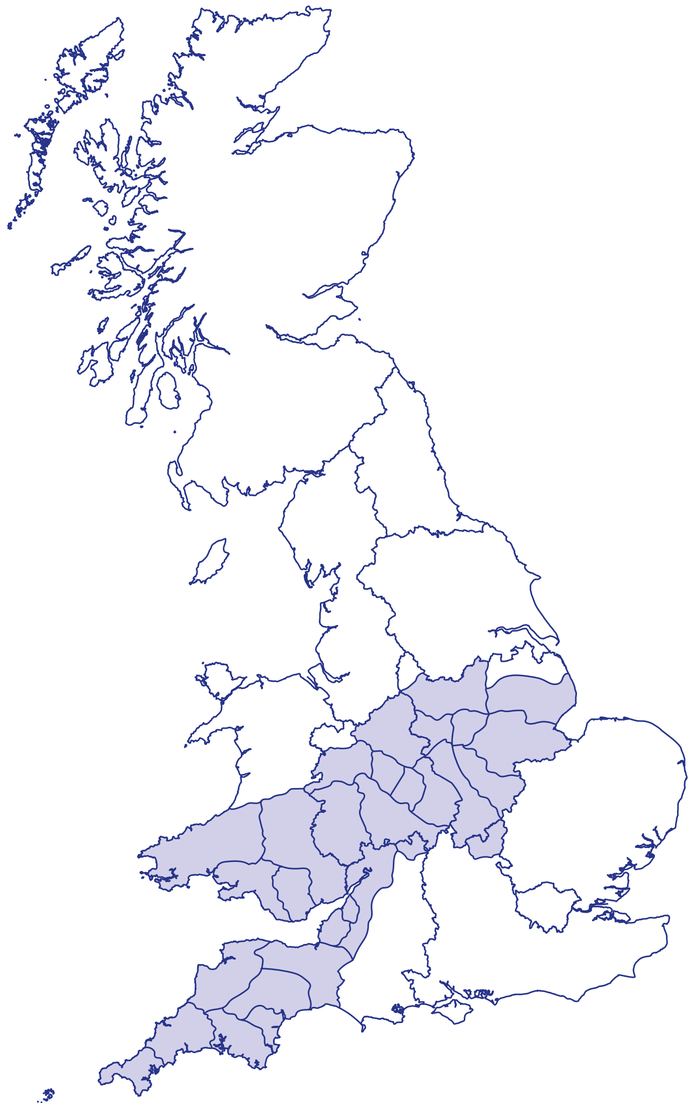
Keep the power flowing
by operating and protecting our assets

Maintain equipment
to ensure our network remains reliable

Fix the network
if equipment becomes faulty or damaged

Connect customers
by using existing capacity, upgrading or building new networks

Operate a smart system
by managing two-way power flows and flexibility services



Overview of our Annual Environment Report, how it's been developed and what's new for this year

National Grid Electricity Distribution's (NGED's) Annual Environment Report (AER) aims to provide all of our stakeholders with a transparent and public account of our environmental performance throughout 2023/24, in line with our RIIO-ED2 Environmental Action Plan.

The AER provides an all-inclusive overview that includes clear justification for our actions, our ongoing environmental core commitments as detailed in our RIIO-ED2 Environmental Action Plan and the benefits that these bring to our customers. Reducing our impact on the environment and embracing the potential which we have to improve the environment at a local, regional and global level is an overarching key commitment for NGED.

The report considers many aspects of NGED's environmental impact demonstrating our ongoing performance against our RIIO-ED2 environmental and sustainability core commitments, by referencing the AER KPI data sheets provided in Appendix A and detailing the environmental initiatives and activities which we have undertaken throughout 2023/24.

UN Sustainable Development Goals

Our environmental and sustainability actions and core focus areas are aligned to a number of United Nations Sustainable Development Goals.

The Sustainable Development Goals provide a global framework for delivering positive change, helping to shape and align our focus on key material issues and situate National Grid's activities in the wider context in which we operate in.

SDG	Definition	Key actions
11 SUSTAINABLE CITIES AND COMMUNITIES	**Make cities and human settlements inclusive, safe, resilient and sustainable.**	• Minimise pollution, protect local habitats and increase biodiversity. • Solar panels on schools. • Collaboration with local communities and charities on net zero ambitions, education and awareness.
12 RESPONSIBLE CONSUMPTION AND PRODUCTION	**Ensure sustainable consumption and production patterns.**	• Reduce waste across our business and throughout our supply chain. • Colleague engagement, training and awareness. • Certification to ISO 14001: environmental management systems.
13 CLIMATE ACTION	**Take urgent action to combat climate change and its impacts.**	• Ensure we meet our 1.5ºC Science Based Target. • Improve biodiversity and develop nature based solutions to combat climate change. • Action our climate change adaptation plan. • Continue Community energy support.

RIIO-ED2 Environmental Commitments and our performance at a glance

Core Commitment 10
Become a net zero organisation by 2043 in line with our validated 1.5ºC science based target (SBT)

Key Benefit over RIIO-ED2	2023/24 RAG Status	Comments
• A cleaner more sustainable environment • Lower greenhouse gas emissions • Healthier, more stable and sustainable ecosystem • Reduced environmental impact from operations • Removal of potentially harmful pollutants from the environment • Healthier and cleaner working environment and improved employee welfare	G	NGED has committed to becoming a net zero organisation by 2043 in line with our validated 1.5 ºC science based target (SBT). As part of this we have established a pathway with annual targets for each year of RIIO-ED2. We have met our targets for 2023/24 in relation to BCF.

Core Commitment 11
Avoid damage to the environment by reducing the volume of leakage from fluid filled cables by 50 per cent by 2028 and replacing the worst leaking circuits with non-oil alternatives putting NGED on target to remove all oil-filled cables by 2060.

Key Benefit over RIIO-ED2	2023/24 RAG Status	Comments
• A cleaner more sustainable environment • Healthier, more stable and sustainable ecosystem • Reduced environmental impact from operations • Removal of potentially harmful pollutants from the environment • Reduced use of raw materials	G	The volume of oil leaked from fluid filled cables during 2023/24 is significantly less than the baseline period (3 year average of performance for 2019/20 to 2021/22) and we have therefore achieved NGED targets for the first year of RIIO-ED2.

RIIO-ED2 Environmental Commitments and our performance at a glance

Core Commitment 12
Significantly reduce our impact on climate change by delivering a 20% reduction in SF_6 losses and drive industry partners to develop technological alternatives to reduce overall volumes of SF_6 on the system.

Key Benefit over RIIO-ED2	2023/24 RAG Status	Comments
• A cleaner more sustainable environment • Healthier, more stable and sustainable ecosystem • Reduced environmental impact from operations • Removal of potentially harmful pollutants from the environment • Reduced use of raw materials	G	The amount of SF_6 lost on the network has improved since targets were set for RIIO-ED2. The baseline for performance is based on performance in 2019/20 and we have achieved NGED targets for the first year of RIIO-ED2

Core Commitment 13
Significantly reduce the environmental impact of our operations by achieving zero waste to landfill by 2028 (excluding hazardous waste) and delivering an overall 30 per cent reduction in tonnage of waste produced.

Key Benefit over RIIO-ED2	2023/24 RAG Status	Comments
• A cleaner more sustainable environment • Reduced environmental impact from operations • Removal of potentially harmful pollutants from the environment • Healthier and cleaner working environment and improved employee welfare • Reduced societal burden from waste (including energy wasted) • Increased resource efficiency from materials management circular economy implementation	A	During 2023/24 we have produced 5,310 tonnes of waste of which 3.48% (14 tonnes) was disposed of to landfill. Our targets for RIIO-ED2 are based on our performance in 2019/20 when 11.36% of waste was sent to landfill. Tonnage of waste as a percentage of overall turnover has increased from 2.95% in 2019/20 to 3.7% in 2023/24. We continue to work with our suppliers and contractors in order to reduce the waste that we produce.

RIIO-ED2 Environmental Commitments and our performance at a glance

Core Commitment 14
Improve visual amenity by removing at least 50km of overhead lines in Areas of Outstanding Natural Beauty and National Parks.

Key Benefit over RIIO-ED2	2023/24 RAG Status	Comments
• A cleaner more sustainable Environment • Healthier, safer, cleaner local communities • Increased amenity value from ecological balance and cleaner environment	A	During 2023/24 we have undergrounded 4.35km of overhead lines within National Parks and AONB. In order to maximise delivery against our target of undergrounding 50km for RIIO-ED2 as a whole we are reviewing internal processes.

Core Commitment 15
Achieve a 10% net gain in biodiversity (in line with nationally recognised assessment tools) for new major projects and for selected primary and grid substation sites.

Key Benefit over RIIO-ED2	2023/24 RAG Status	Comments
• A cleaner more sustainable environment • Lower greenhouse gas emissions • Healthier, more stable and sustainable ecosystem • Healthier and cleaner working environment and improved employee welfare • Increased amenity value from ecological balance and cleaner environment	G	Since becoming a legal requirement in February 2024 NGED have 20 active project sites where a biodiversity net gain is a planning requirement. Biodiversity baseline surveys have been undertaken at 40 substation sites across our four licence areas.

Reducing our environmental impact
Our Core Commitments

Our Science Based Target and Business Carbon Footprint (BCF)

RIIO-ED2 Core Commitment
Become a net zero organisation by 2043 in line with our validated 1.5ºC science based target (SBT).

Our RIIO-ED2 Environmental Action Plan (EAP) was published in 2021 and since then we have become National Grid Electricity Distribution (NGED) operating as a business unit subsidiary of our wider parent company National Grid Group plc.

As part of National Grid Group plc NGED have now aligned to the Group's validated 1.5ºC science based target (SBT) to achieve net zero carbon emissions across Scopes 1, 2 and 3 by 2050.

Under our Group target and in line with our original RIIO-ED2 ambitions NGED remain committed to becoming a net zero organisation by 2043 for scope 1 and 2 emissions (including network losses) and by 2050 for Scope 3 emissions.

NGED's restated ambition under our new parent company 1.5ºC SBT demonstrates a realistic and focused approach to achieving carbon emission reductions across all three emission Scopes by 2050.

As part of our commitment to achieving our SBT we have established a pathway with annual targets for each year of RIIO-ED2.

We have met our targets for 2023/24 in relation to our Business Carbon Footprint (BCF).

Our performance against key indicators of environmental performance are detailed in the following sections.

Reducing our environmental impact
Our Core Commitments

Our Business Carbon Footprint (BCF)

Our Business Carbon Footprint (BCF) details the impact that our operational activities have on the environment in terms of associated carbon dioxide (CO_2) emissions.

We measure and report our BCF using equivalent tonnes of carbon dioxide (tCO_2e). The data compiled and the figures which we report follow a recognised methodology as described within international business carbon footprint standards, the Greenhouse Gas (GHG) reporting protocol and ISO14064-1.

All of our published BCF data has been verified and data assured for accuracy and compliance with the standards detailed above.

Our annual carbon footprint is expressed as tonnes of carbon dioxide equivalent (tCO_2e) which accounts for all six Kyoto* GHG emissions;

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur Hexafluoride (SF_6)**

NGED currently report on the following carbon emission categories within the BCF;

Scope Category	Emission releasing activity
Scope 1 Direct emissions from owned or controlled sources	• Building energy use - gas • Operational transport (road/rail/air/sea) • Fugitive emissions (SF_6) • Fuel combustion
Scope 2 Indirect emissions from the generation of purchased electricity	• Building energy use – electricity • Substation energy use – electricity • Telecoms energy use - electricity • Losses (as detailed in the Regulatory Instructions Guidance (RIGs))
Scope 3 Other indirect emissions (not included in Scope 2)	• Category 1 – Purchased Goods and Services • Category 2 – Capital Goods • Category 5– Waste Disposal • Category 6 – Business Travel • Category 7– Commuting

*Kyoto Protocol – an international agreement that aimed to reduce carbon dioxide emissions and the presence of greenhouse gases (GHG) in the atmosphere.
**NGED also report direct scope 1 SF_6 emissions at tCO2e as per Ofgem requirements

Reducing our environmental impact
Our Core Commitments

Our Business Carbon Footprint (BCF)

1

Scope 1
Direct emissions

Direct emission that are owned or controlled by a company.

Emissions from sources that an organisation owns or controls directly.

Example
From burning fuel in the company's fleet of vehicles (if they are not electrically powdered).

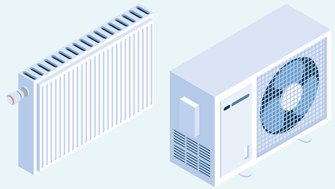
2

Scope 2
Indirect emissions

Indirect emissions that are a consequence of a company's activities but occur from sources not owned or controlled by it.

Emissions a company causes indirectly that come from where the energy it purchases and uses is produced.

Example
The emissions caused by the generation of electricity that's used in the company's buildings.



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Scope 3
Indirect emissions

Indirect emissions that are a consequence of a company's activities but occur from sources not owned or controlled by it.

All emissions not covered in scope 1 or 2, created by a company's value chain.

Example
When the company buys, uses and disposes of products from suppliers.

Reducing our environmental impact
Our Core Commitments

Our Business Carbon Footprint (BCF)

Table 1 provides an overview of our reported BCF for Scope 1 and Scope 2 emissions, detailing annual reported data alongside both our annual and end of ED2 targets. The Table also provides details of the percentage changes of actual reported emissions and the target emissions.

Table 1: Annual BCF reporting (Scope 1 & 2) against SBT annual target and end of ED2 target (tCO2e)

Aspect	Baseline year (19/20)	2023/24 Reported	2023/24 SBT target	2023/24 reported vs. 23/24 target (%)	2027/28 SBT Target	2023/24 reported vs. 2027/28 target (%)
Total Scope 1	35,530.00	29,061.14	30,376.10	-4.52%	30,961.25	-6.54%
Total Scope 1 & 2 excluding losses	56,404.53	44,689.49	45,340.84	-1.45%	37,780.85	+15.46%
Total Scope 1 & 2 including losses	1,029,468.81	827,492.16	828,143.51	-0.08%	422,833.23	+48.90

To support our 2043 target we have established a pathway with annual targets for each year of RIIO-ED2 and we have met our in year target for 2023/24. A significant proportion of our carbon emissions relate to technical network losses and therefore in Figs 1 and 2 we show performance both including and excluding losses to allow a more detailed understanding of performance within smaller emissions categories.

Further details on our BCF data can be found in Appendix A

Reducing our environmental impact
Our Core Commitments

Our Business Carbon Footprint (BCF)

The scope of our BCF reporting has changed for RIIO-ED2 and no longer includes Scope 3 carbon emissions associated with our Business Travel or contractor activities. Figure 1 and Figure 2 below present our Scope 1 and 2 performance against our new SBT targets.

We have seen emission reductions from our baseline year in use of electricity in our buildings, other fuels used in buildings, operational vehicle use, SF_6 emissions and fuel combustion.

Figure 1: NGED 23/24 BCF (tCO_2e) (excl. losses) vs SBT during RIIO-ED2

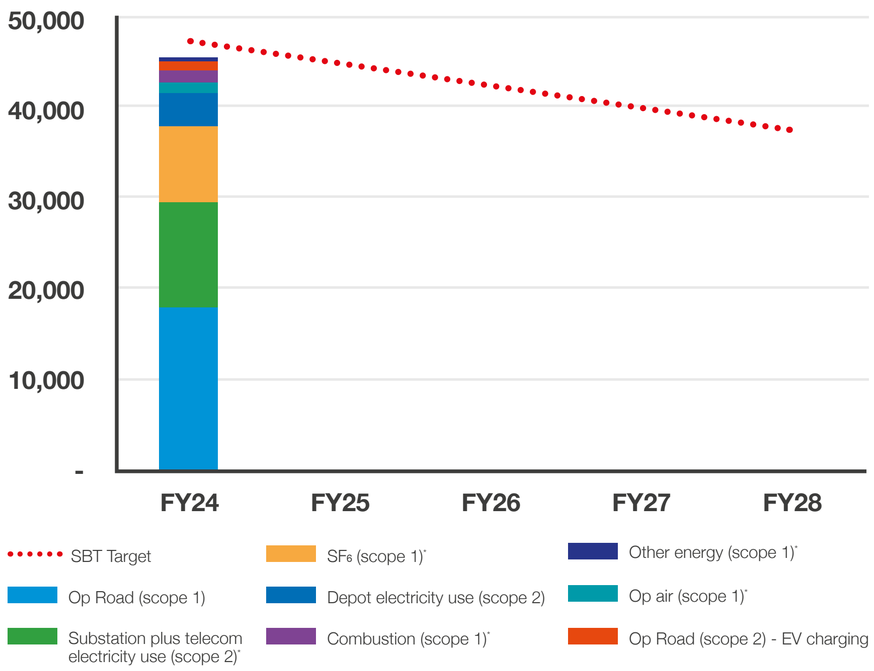
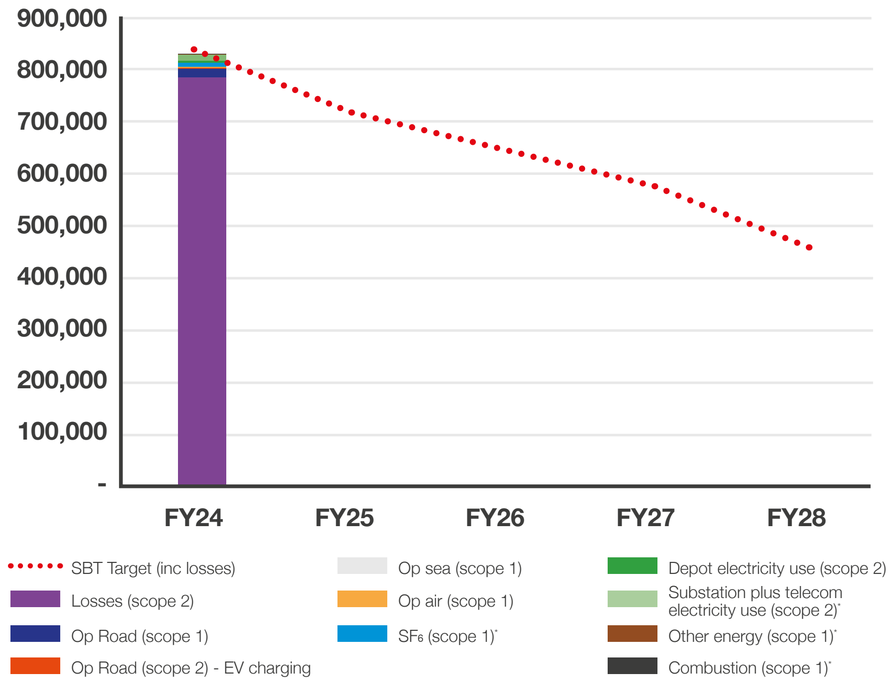


Figure 2: NGED 23/24 BCF (tCO_2e) (incl. losses) vs SBT during RIIO-ED2



Further details on our BCF reporting can be found in Appendix A.

Reducing our environmental impact
Our Core Commitments

Our Business Carbon Footprint (BCF)

Figure 3: Energy consumption (kWh) at NGED Buildings and Substations over ED2

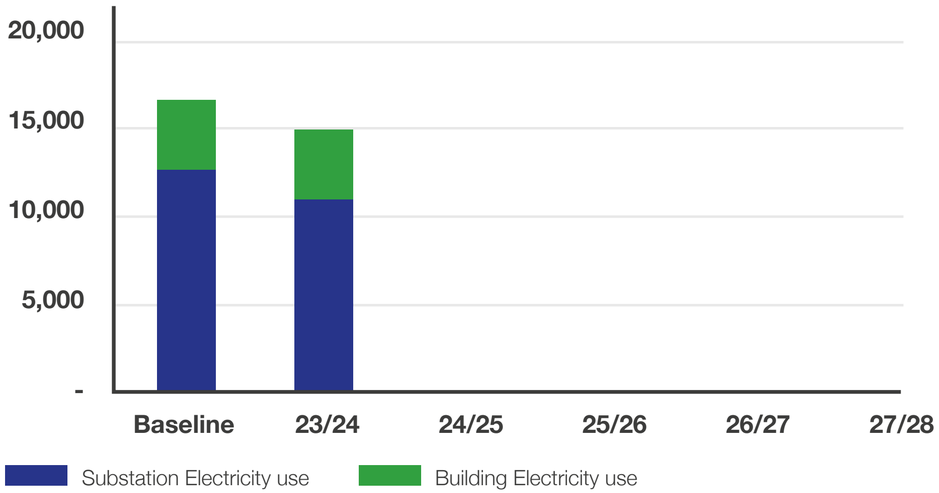
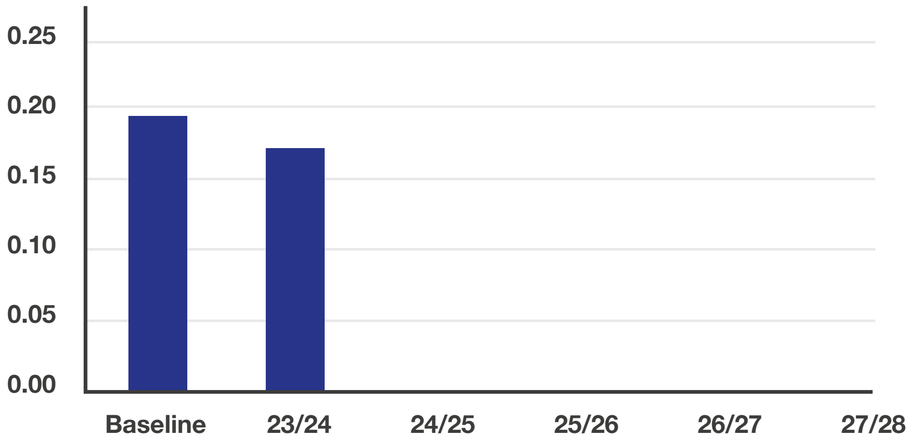


Figure 4: CO_2e intensity of an operational km travelled over ED2 $kgCO_2e/km$



As per Figure 3 our energy consumption for both NGED buildings and substations has decreased during 2023/24 when compared to our baseline year of 2019/20. The proportion of substation energy use vs. building energy use remains approximately the same. Throughout RIIO-ED2 we will continue to use local awareness initiatives and the installation of energy saving equipment to further reduce our energy use.

As per Figure 4 whilst the number of vehicles within our operational fleet has remained approximately the same the CO_2e intensity of an operational km travelled in terms of $kgCO_2e$ has reduced in 2023/24 when compared to our baseline year. The continued use of our company wide Driver Behavioural System (DBS) has played a significant role in our improved performance along with the improved vehicle fuel efficiency of the fleet.

Reducing our environmental impact
Our Core Commitments

Electric Vehicles

We have continued with our journey of fleet electrification. The percentage of electric vehicles in our commercial fleet is 12% (up from 9% in 22/23) and leased fleet is 50% (up from 25% in 22/23).

We have also installed electric vehicle chargers at a number of our primary substations. We have an ambition to install c. 200 chargers across 92 primary substations in 24/25.

Contracts for Electric Vehicle Charge Point Infrastructure are to be awarded, this will enable our project management teams to begin installing one of the largest private electric vehicle charging networks in the UK.

This will mean our operational teams will always be within a 10 mile radius of an NGED owned and operated charger.

Reducing our environmental impact
Our Core Commitments

Scope 3 emissions

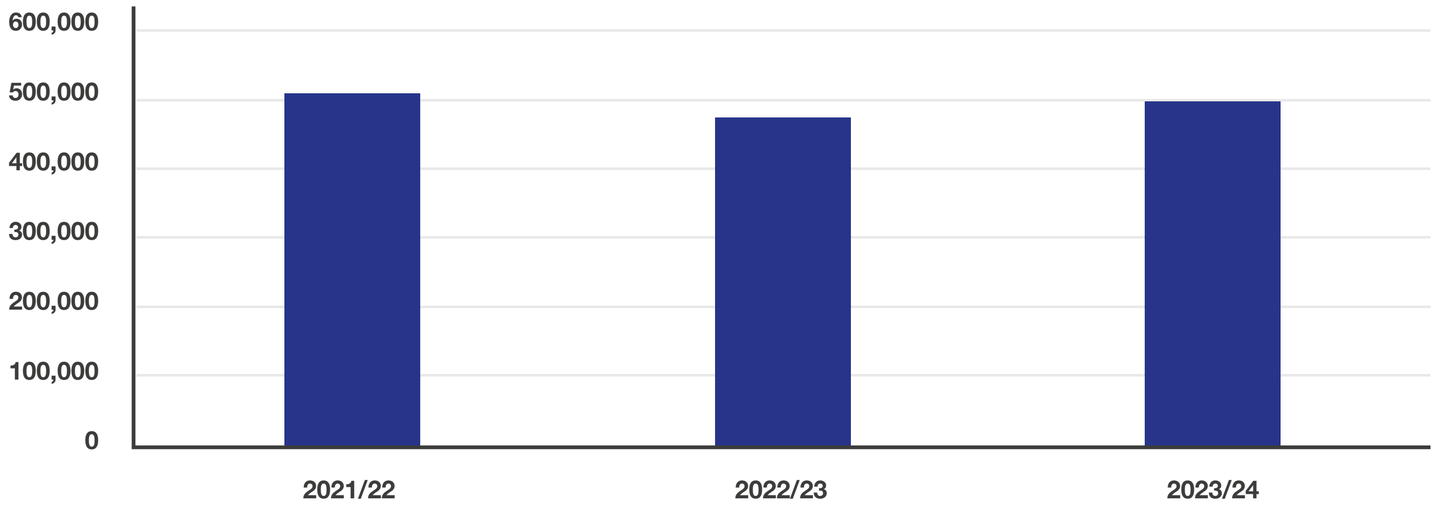
The GHG Protocol defines Scope 3 carbon emissions as all indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions.

The Greenhouse Gas Protocol Technical Guidance for Calculating Scope 3 Emissions (v1) identifies 15 reporting categories for scope 3 – NGED as part of the wider National Grid Group currently report on two of those categories;

Category 1
Purchased Goods and Services

Category 2
Capital Goods

Figure 5: NGED Purchased Goods & Service and Capital Goods (Cat 1&2 combined) Scope 3 emissions (tCO_2e)



NGED's Scope 3 emissions are calculated using Global Industry Classification Standard (GICS) emission factors using a spend based approach however work is currently being undertaken within NGED to assess and develop an activity based approach to calculating Scope 3 emissions.

Reducing our environmental impact
Our Core Commitments

Scope 3 emissions

Scope 3 emissions – deep dive

Working with our consultants Anthesis our objective was to perform a deep dive analysis into the highest emitting categories of spend by recalculating the emissions related to these categories on an activity-basis, rather than relying on spend based calculations. Activity based emission data will enable NGED to model reductions in emissions and in turn set credible reduction targets for Scope 3 emissions.

The project with Anthesis collected physical data from suppliers to calculate the emissions of the top five purchased goods and services (PG&S) categories, representing 70% of emissions by spend. These categories include underground cabling (30%), construction (15%), dig and lay (9%), transformers (9%) and tree trimming (8%).

Scope 3 emissions deep dive - Activity/Product based approach

For Scope 3 emission categories where it is possible to gather specific activity data, such as the quantity of a certain material or product purchased during the reporting period, the product-based approach was applied. This involved using a combination of primary activity data from NGED, supplier-specific information, and Life Cycle Assessment (LCA) data to calculate the emissions relating to the product. Where only partial data was available, the Project employed mathematical estimations to gap-fill.

A key outcome of this project is a clear list of next steps and recommendations that NGED can now action to improve our Scope 3 reporting going forward;

- Engage with partners that supply transformers. Given the scale and longevity of these products/equipment, it is a reasonable request that NGED ask suppliers for an EPD or LCA of the products that they are supplying.

  This will be the easiest way to allocate impact across all transformers used by NGED. It is worth confirming the product boundaries used in these calculations as well as what standard has been followed.

  This will enable NGED to compare the results from different suppliers. A similar approach can be taken with switch gear, circuit breakers and other significant pieces of network equipment.

- Work with procurement and project teams to better-understand how spend data is aggregated across projects and whether it is possible to get more detailed outputs from procurement.

  Doing this would enable a project-view to be taken when it comes to estimating impact. It would also enable input-output factors to be applied at a more detailed level and therefore improve accuracy of these calculations.

- Collect fuel consumption data for dig and lay and tree trimming activities.

  Combined with the above information, this would enable representative project impacts to be calculated and this impact can then be allocated across the wider spend categories.

The results of this project are a great step forward as it has provided a foot-print of the most significant PG&S category in underground cabling. The completion of the above points will allow NGED to expand its detailed Scope 3 inventory and ultimately be in a much stronger position to understand how it would achieve a Scope 3 reduction target.

Reducing our environmental impact
Our Core Commitments

NGED vision for losses

Our vision for losses during the current price control period, RIIO-ED2, is dominated by the journey to net zero by 2050 and the mechanisms that are needed to facilitate it.

The benefits of energy efficiency are sizeable, but the pace of decarbonisation and the cost of immediate traditional upgrades and reinforcement mean that we must use flexibility and alternative means to deliver net zero.

This higher utilisation of the network will lead to an increase in losses. Our focus must therefore be how we can manage losses to be as low as practicably possible in a highly utilised network.

Our Losses Vision Statement

"To proactively manage losses, minimising them where possible, to ensure that we deliver value to our customers alongside the action needed to facilitate net zero".

Click here to view
NGED Losses Strategy Dec 2023

Losses stakeholder engagement

When the first edition of the Losses Strategy was published in 2014, NGED carried out a stakeholder engagement process to ensure that the Strategy was formed on the basis of what our stakeholders wanted.

Since then we have conducted four further formal stakeholder events to gather insight into losses. Engagement has included input from more general stakeholders as well as stakeholders with greater technical awareness and a specific interest in losses.

General learnings were that although stakeholders were interested to hear progress, those with a greater technical awareness were more engaged with the topic of losses.

Updates on innovation projects as well as collaborations with other DNOs were found to be effective ways of maintaining engagement.

Based on feedback, we believe that the frequency of both stakeholder engagement events and the update of the Losses Strategy can be limited to whenever there is a significant update to discuss and report.

The feedback from these stakeholder engagement events has been used to inform our Losses Strategy and to ensure that we have considered stakeholder opinions and values in developing our strategy for managing losses.

Reducing our environmental impact
Our Core Commitments

Making it Happen

In order to make our losses vision happen, we will be proactive in our approach to managing losses.

A high level outline of how we will achieve this is detailed opposite.

Further information regarding the reporting of losses, the consideration of losses when replacing assets and NGED innovation projects relating to assets and network losses can be found in the published NGED Losses Strategy.

Data

Our data team collects, processes, analyses and presents data across the business.

Data gives us the knowledge that we need to make decisions for customers, business and the planet.

Research

We must use this data to ontinue to learn about losses, how we can manage them and maintain regular CBAs.

This includes research from various teams including Innovation and Distribution System Operator (DSO) as well as collaborating with academia, business and other Distribution Network Operators (DNOs) to find a balanced approach.

Create

From our learning, we must ensure that we are creating loss inclusive policies. The assets that we are connecting to the network now are those which will be in place long after the 2050 net zero deadline.

We must therefore ensure that our policies are forward-looking and appreciate what our network may look like not just in five or 10 years but in 20, 30, 40 years time.

Whenever a new initiative is introduced in the Losses Strategy, the relevant Policies and Standard Techniques are updated.

Train

NGED is known for its excellence in training.

We must ensure that staff know and appreciate the importance of policy and the context behind its implementation and that staff are alerted to significant changes to out Losses Strategy and relevant policies.

Engage

We must listen to staff, customers and stakeholders to ensure that we continue to do the right thing for managing losses.

Reducing our environmental impact
Our Core Commitments

Fluid Filled Cables

Older styles of electricity cables contain oil to improve their insulation properties and to enhance cooling. Occasionally, from time to time, these older cables leak when equipment is damaged, seals deteriorate or as a result of changing ground conditions.

When this happens we proactively take steps to ensure that any damage to the environment is minimised through the removal of contaminated ground and that the leak is fixed as quickly as possible.

During RIIO-ED2 we have also put in place measures to help reduce the overall number of leaks that we have across our network.

The risks associated with operating fluid filled cables (FFC) and related assets can be reputational, regulatory and financial.

The primary risk is associated with the leakage of insulation oil into the environment causing pollution.

Leaks typically occur as the cable sheath deteriorates with age, at joint failures or as a result of third-party damage.

To minimise environmental damage we aim to ensure that:

- fluid levels in all our cables are monitored remotely, the loss of pressure triggering an alarm in our Control Centres. This enables us to react quickly to any leak event
- leaks are located quickly using perfluorocarbon tracer (PFT) and repaired
- cables with a history of high leak rates are selected for replacement.

Additional mitigation may range from visual inspection or PFT tracing, to spot repair, sectional drain and seal or the full extraction of the cable.

All leak rates are recorded and a database of leak and cable information is held centrally. Volumes of FFC losses reported within this document take into account oil subsequently recovered by our Contaminated Land specialists as part of our ongoing incident remediation activities. Monthly reports of fluid filled cable leaks are submitted to both the Environment Agency and Natural Resources Wales.

RIIO-ED2 Core Commitment
Avoid damage to the environment by reducing the volume of leakage from fluid filled cables by 50 per cent by 2028 and replacing the worst leaking circuits with non-oil alternatives putting NGED on target to remove all oil-filled cables by 2060.

Reducing our environmental impact
Our Core Commitments

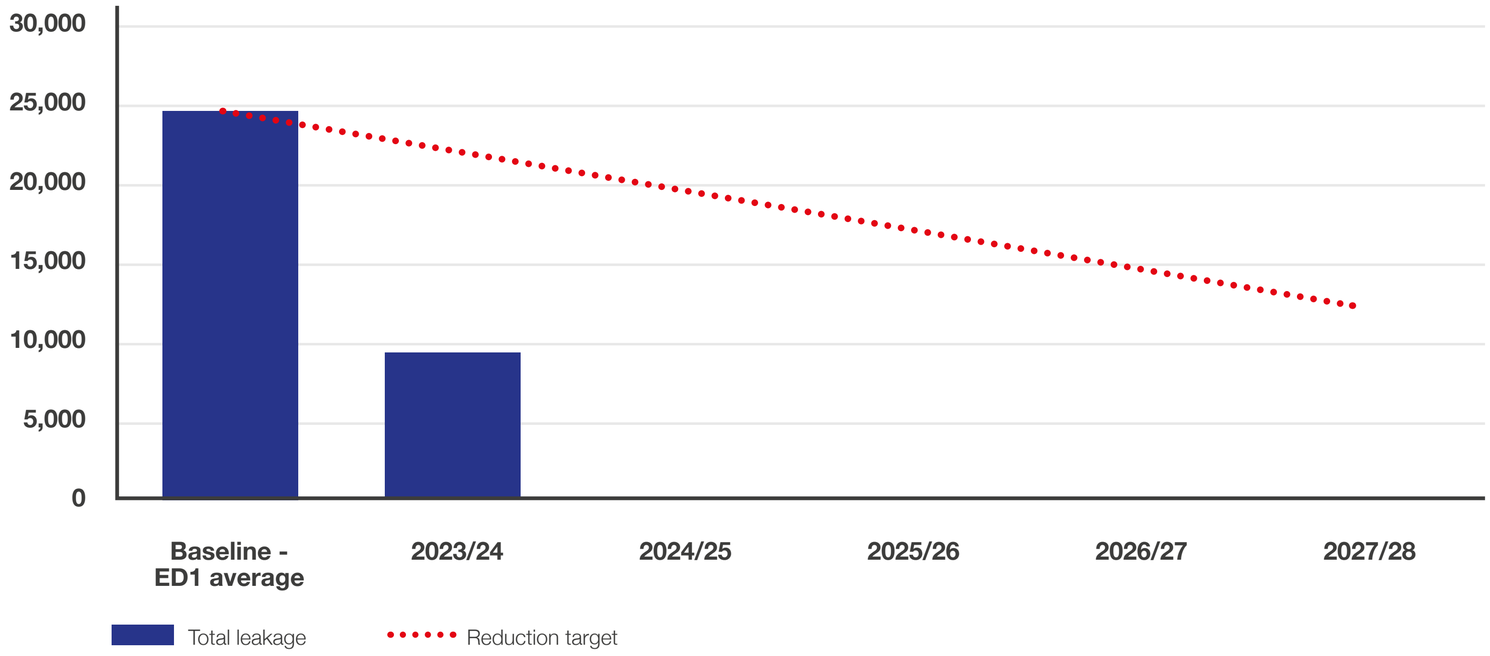
Fluid Filled Cables

The volume of oil leaked from fluid filled cables during 2023/24 is significantly less than the baseline period (3 year average of performance for 2019/20 to 2021/22) and we have therefore achieved NGED targets for the first year of RIIO-ED2 as shown opposite.

Each licence area has also achieved their individual in year targets.

The reduction in leakage from FFC is the result of reduced variation in ground temperatures. Changes in ground temperature cause the expansion and contraction of ground materials which can lead to movement of cables in the ground and consequential damage to joints, causing leaks. 2023 was the warmest year on record for the UK, with eight out of the twelve months warmer than average. In addition, increased PFT tagging and improved leak detection, particularly within our West Midlands licence area, enabled quicker resolution when cables did leak.

Figure 6: FFC leaks vs RIIO-ED2 reduction target



Further details on our fluid filled cable reporting can be found in Appendix A.

Reducing our environmental impact
Our Core Commitments

Sulphur Hexafluoride (SF_6) & Other Insulation and Interruption Gases (IIGs)

SF_6 gas has been used for many years throughout the electricity industry as an insulating medium in switchgear. It has many benefits but has an extremely high greenhouse gas global warming potential (GWP).

RIIO-ED2 Core Commitment
Reduce our impact on climate change by delivering a 20% reduction in SF_6 losses and drive industry partners to develop technological alternatives to reduce overall volumes of SF_6 on the system.

As part of our ongoing commitment to achieve our SBTi targets and as bans on SF_6 are being introduced in certain equipment, NGED is working closely with manufacturers in the development of SF_6 alternatives to ensure equipment meets operational safety requirements in the UK. In addition, where an existing SF_6 asset replacement is required we replace with a lower SF_6 volume unit, lowering the overall SF_6 bank.

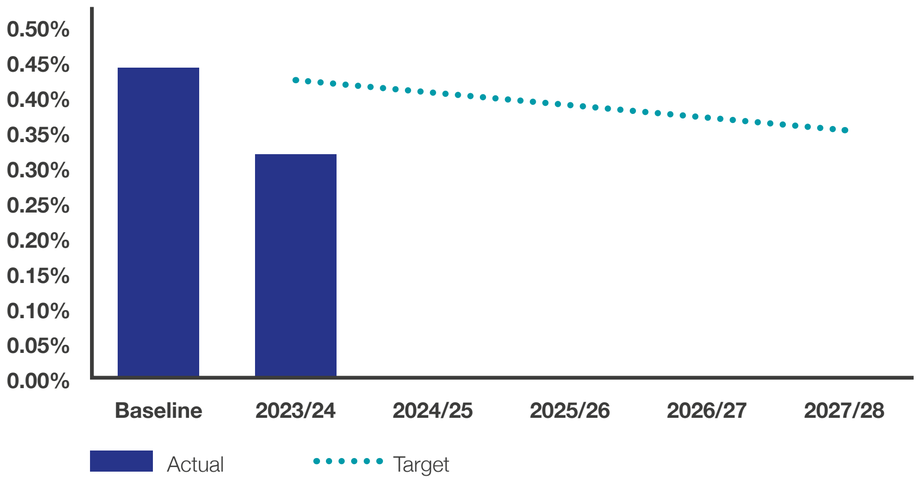
Over multiple years, we have engaged with all major developers of SF_6 free apparatus (Siemens/Schneider/Hitachi/Lucy). NGED have offered to sponsor a number of non SF_6 products through the ENA Notice of Conformity process (NoC) which aids those manufacturers selling their devices to any UK DNO and potentially others who also follow the UK related technical specifications.

We have also continued with our installation of non SF_6 145kV Live Tank Circuit Breakers and now have seven active units with an eighth ready for installation and orders for a significant additional number for installation in next few years. For the lower voltage, higher volume products (i.e. ring main units), several manufacturers are in the final stages of bringing SF_6 free alternatives to market and these are expected to start to appear over the next 12 months initially on a trial basis.

The amount of SF_6 lost on the network has improved since targets were set for RIIO-ED2. The baseline for performance is based on performance in 2019/20 and we have achieved NGED targets for the first year of RIIO-ED2 as shown in Figure 7.

Further details on our SF_6 reporting can be found in Appendix A

Figure 7: SF_6 Leakage rate (%) NGED Total



Reducing our environmental impact
Our Core Commitments

Monitor our use of resources and reduce waste

Throughout 2023/24 we have continued to work closely with all of our waste contractors in all four of our licence areas to ensure that wherever possible waste streams have been diverted from landfill, and that the principles of the waste hierarchy have been applied throughout the business.

We continue to segregate our waste at all of our depot locations and transport units into the following waste streams:

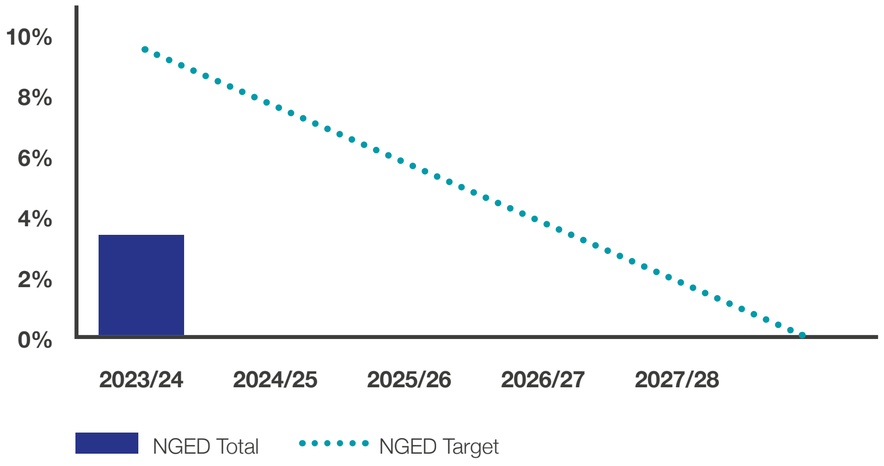
- Dry mixed recyclables*
- General waste
- Hazardous waste**
- Redundant wood poles
- Metal
- Wood
- Cable
- Organics

RIIO-ED2 Core Commitment
Reduce the environmental impact of our operations by achieving zero waste to landfill by 2028 (excluding hazardous waste) and delivering an overall 30% reduction in tonnage of waste produced.

During 2023/24, the first year of RIIO-ED2, we have worked very closely with our waste contractors in the South West to improve our waste landfill diversion rates across the region. As a result our diversion in the South West has increased from 76.4% in our baseline year (2019/20) to 88.4% in 2023/24. This improvement has had a positive impact on our landfill diversion rates across our entire region increasing from 88.6% in our baseline year (2019/20) to 96.52% in 2023/24. Just 3.48% of our total waste in 2023/24 was sent for disposal to landfill our target for the year was 9.47% therefore we are well on track to achieve our zero waste to landfill by the end of RIIO-ED2.

*Cardboard/paper/plastics
**Batteries/contaminated rags/used electrical insulating oil/aerosols/fluorescent tubes

Figure 8: Percentage of waste to landfill



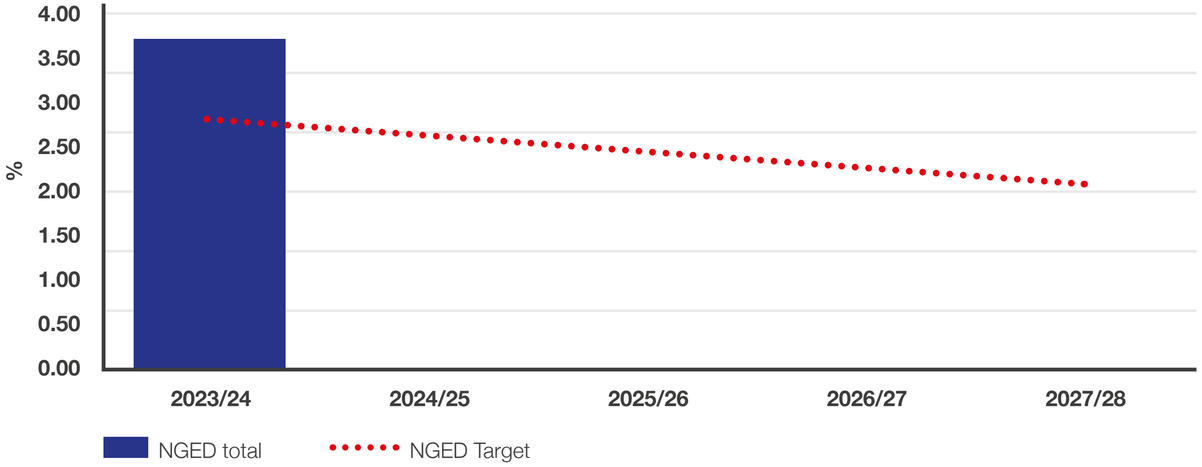
Reducing our environmental impact
Our Core Commitments

Monitor our use of resources and reduce waste

The tonnage of waste produced annually varies dependent on the amount of work being carried out and we therefore calculate improvements by calculating tonnage of waste as a proportion of annual turnover.

Targets are based upon a baseline year of 2019/20. Our performance can be seen below;

Figure 9: Tonnage of waste per £m turnover (%)



Whilst we are taking positive steps to reduce the amount of waste that we send to landfill we are producing greater amounts of waste in comparison to our baseline year of 19/20. We are focussed on reducing all of our waste streams, including the overall tonnage of waste as a proportion of turnover, and achieving our ED2 target, despite current challenges. We are in the process of tendering for NGED waste contractors as part of the wider National Grid Group. We have made clear our commitment to reducing our overall tonnage of waste and will include this requirement as part of the tender process. We continue to work with our procurement teams to address issues such as minimizing the waste from packaging of materials and the potential for take-back schemes from our suppliers.

Further details regarding waste management data can be found in Appendix A.

Sustainable Resource Use & Waste

As part of the wider National Grid Group the process of tendering for NGED contracts globally alongside other National Grid business units provides an improved approach.

This includes addressing packaging issues, recycling rates and use of recycled materials with suppliers and manufacturers.

The tendering process enables the best environmental fit for disposing of packaging that is entering the business. Collaboration within NGED with other contract specifiers on packaging of goods is also an integral part of the purchasing process.

NGED's waste contractors assist further by continuously reviewing the waste streams with a view of changing the end destination. Innovative solutions are being utilised to replace recovery with recycling, implementing circular economy solutions or use of new processing plants available within their portfolio.

The formation of NGED and the structural changes created delays with waste reduction surveys in the first year of RIIO-ED2, but our strategy remains unchanged.

The procurement tender process will specifically target manufacturers and suppliers highlighting the weight of waste packaging resulting from products. Additionally, waste contract reviews, ongoing collaboration and the increase of recycling via NGED depots will address excessive waste and better resource use.

The assessment of containers will further enable segregation to aid diversion from landfill and recovery.

Some initial assessments carried out specifically on the handling of pallets, produced an encouraging picture of this particular waste stream.

The lessening of single use plastics with plastic stirrers and cutlery withdrawn from NGED depot locations has contributed to improvements.

Further product specific surveys will identify where we can achieve the most reductions.

Reducing our environmental impact
Our Core Commitments

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

While overhead lines are widely accepted as being part of the countryside, there are a number of protected landscapes, including AONBs and National Parks across our geographical footprint where removing our overhead lines and replacing them with underground cables would visually improve matters.

We coordinate the undergrounding of overhead lines with established steering groups consisting of representatives from AONBs and National Parks who help us identify and prioritise where and when work will take place.

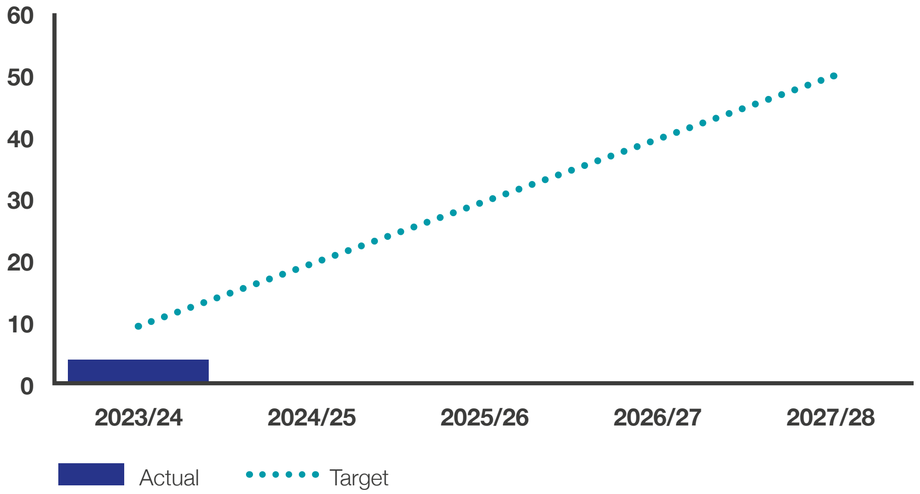
We provide information and appropriate assistance to relevant stakeholders to help them in the selection and prioritisation of appropriate schemes, understanding associated costings and complete feasibility assessments. We have always been committed to working with the organisations responsible for National Parks and AONBs.

RIIO-ED2 Core Commitment
Improve visual amenity by removing at least 50km of overhead lines in Areas of Outstanding Natural Beauty and National Parks.

During 2023/24 we have undergrounded 4.35km of overhead lines within National Parks and AONB.

We are currently not on target against this commitment. We are improving our reporting mechanisms, stakeholder engagement processes and understanding to deliver and to bring this commitment back on target.

Figure 10: Undergrounding (km)



Reducing our environmental impact
Our Core Commitments

Biodiversity

Biodiversity Net Gain (BNG) legislation came into effect in England in February 2024 as a key component of the Environment Act. The legislation states that development projects must have a positive impact on biodiversity. All developments should now contribute positively to the natural environment, leaving habitats in a measurably better condition post-development.

A biodiversity survey is undertaken before development using the statutory biodiversity metric to explore options to achieve 10% biodiversity net gain. If the 10% net gain cannot be achieved by creating and enhancing on-site habitats developers can either make off-site biodiversity gains on their own land outside the development site, or buy off-site biodiversity units on the market.

RIIO-ED2 Core Commitment
Achieve a 10% net gain in biodiversity (in line with nationally recognised assessment tools) for new major projects and for selected primary and grid substation sites.

NGED has put in place guidance for managers in order to ensure that we are compliant with the new legislation. There are 20 active NGED Major Project sites where a BNG obligation is now in place, surveys have been undertaken and plans have been established.

Table 2: Active NGED Major Project sites requiring a BNG obligation

	2023/24*
East Midlands	4
West Midlands	2
South West	2
South Wales**	12
TOTAL	**20**

*Measured only from February 2024 when BNG became a legal obligation.
** BNG is not a legal requirement in Wales however we are working with a number of local authorities to bring about BNG on 12 Welsh project sites.

Reducing our environmental impact
Our Core Commitments

Biodiversity

Selected Primary and Grid Substation Sites

In line with our commitment, we have gone beyond our statutory obligations and identified an additional 40 primary and grid substation sites across our four licence areas where Biodiversity Management Plans will also be implemented.

We have undertaken baseline biodiversity surveys and are collaborating with ecological consultants, vegetation management and grounds maintenance contractors to put in place local habitat management arrangements and biodiversity enhancements to enable a minimum on-site biodiversity net gain of 10%.

An example of the types of activity that we will use to improve biodiversity is modifying our existing cutting regimes, reducing the frequency and intensity of grass cutting. This allows for the seeding of wildflowers for pollinating insects and scrub for birds. We are facilitating a move away from traditional grounds maintenance to habitat management.

We recognise the statutory requirement to maintain habitats for a minimum of 30 years and the selected additional 40 sites with Biodiversity Management Plans described above will have conservation covenants, secured for 30 years. A conservation covenant is an agreement that sets out obligations in respect of the land which will be legally binding not only on the landowner but on subsequent owners of the land.

We will report progress in biodiversity net gain over the course of RIIO-ED2 demonstrating the impact of our activities on the biodiversity of our sites.

We are committed to establishing biodiversity good practice across our regions and will identify a further 40 sites for biodiversity surveys in 2024/25.

Reducing our environmental impact
Our Wider Commitments

Embodied Carbon

Embodied carbon is the carbon footprint of a material, product or an activity. It takes into account how much greenhouse gas is released throughout the supply chain and is often measured over the entire life cycle of a product or service.

During the first year of ED2 we have worked alongside NGED Innovation colleagues and AECOM to develop Project ALPACA – an NIA funded project specifically looking at an Approach for Long-term Planning Accounting for Carbon Assessment (ALPACA).

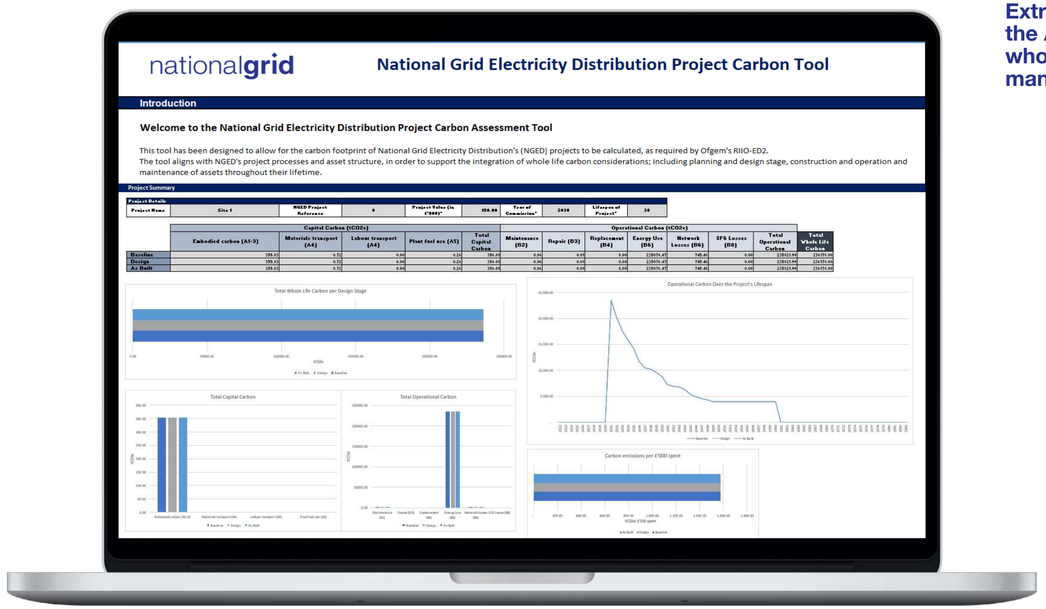
The ALPACA tool is an offline EXCEL based tool designed to be used by NGED and its contractors as part of the activities leading up to the design, construction/installation of a new project and, as such, it is designed to integrate with existing NGED project processes and systems.

The outputs from the tool will allow NGED and its contractors to compare and evaluate the whole life carbon impacts for any given project. The ALPACA tool is designed to be used at defined project phases that are traditionally adhered to during NGED projects;

Planning
For projects of a significant size a baseline footprint should be calculated at the planning stage.

Detailed design
Applicable to most NGED projects, a design footprint should be calculated.

As built
Once a project has been commissioned an as-built footprint should be calculated.



Extract from the ALPACA whole life carbon management tool

The ALPACA tool aligns with PAS2080 (Publicly Available Specification (PAS) 2080: Carbon Management in Infrastructure) and the modular approach for calculating whole life carbon, industry best practice and endorsed by the Energy Networks Association DNO Environment Committee.

During 2024/25 we will begin trialling the use of Project ALPACA tool at a number of NGED major project locations with a view to companywide roll-out by the end of 2025/26. Following the 12 month trial period we will identify any gaps or opportunities to improve and develop the tool, ensuring that it maintains to be fit for purpose for NGED sites.

NGED will continue to work collaboratively with other DNOs via the Energy Networks Association Capital Carbon Working Group. Project ALPACA and other bespoke embodied carbon tools have been shared and discussed as part of the Working Group, with a view of developing a common tool for all DNOs to use when calculating embodied carbon ensuring consistency and commonality for future reporting.

Reducing our environmental impact
Our Wider Commitments

Supply chain management

As part of our wider commitments over the course of RIIO-ED2, we have pledged to work closely with our suppliers, partners and manufacturers in order to improve environmental and sustainability performance throughout our supply chain. As part of the wider National Grid Group NGED is in a strong and influential position to act on a global supplier platform.

NGED are proud to be part of a National Grid Sustainable Procurement Working Group. The main focus of the Group is to establish an overarching Sustainable Procurement Strategy, highlighting and addressing key issues such as Carbon, Human Rights, Circular Economy, Resource Consumption, Category Strategies, Tender processes and Supply Chain Transformation goals.

The process for tendering and awarding contracts within NGED has changed substantially and many activities have become aggregated through global tenders for the whole National Grid Group. Thus improving NGED's ability to demand better sustainability and environmental performance from prospective bidders. Most contracts, with the exception of minor works, now state certification to ISO 14001 as a pre-requisite for bidders to be considered.

Every NGED tender now has a detailed and comprehensive sustainability section and as a result the responses produce an improved holistic reflection of sustainability performance from prospective suppliers.

The Sustainable Procurement Working Group also works closely with the National Grid Carbon Working Group with the intention of implementing a carbon tool for the procurement process. Such a tool will create a platform for suppliers to input details that facilitate like for like comparisons on carbon performance in the future. Similarly, sustainability forms part of the agenda for all contract review meetings with suppliers reporting on their initiatives and progress.

Reducing our environmental impact
Our Wider Commitments

Polychlorinated biphenyls (PCBs)

PCBs are an organic man-made chemical and part of a group of chemicals known as Persistent Organic Pollutants (POPs). Due to their persistence in the environment and their ability to bio-accumulate they have the potential to cause environmental damage if lost to the environment.

Prior to a global ban on PCBs in the 1980s, they were used in some industrial electrical applications. Some advantages included the quality of chemical stability, fire resistance and properties as good electrical insulators. Electricity network operators however never specified them for use.

Despite NGED never requiring the use of PCBs on our network, some unintentional contamination did occur. The contamination transpired when PCBs were manufactured domestically throughout much of the twentieth century. Used in hundreds of other industrial and commercial applications including in electrical equipment such as capacitors and transformers.

As a Party to the Stockholm Convention, an international agreement on POPs, the United Kingdom (UK) developed a National Implementation Plan (NIP) in 2007 and an update was published in 2013. In 2019, the UK government updated the PCB legislation, which tightened existing law. This entails the removal of all equipment with a PCB content greater than 50 parts per million (ppm) by 31 December 2025.

NGEDs assets manufactured prior to a ban PCBs in 1987, were potentially affected greatly by this change. Despite more than 96% of assets being unaffected, those that were impacted, were contaminated accidentally and so never identified or recorded as containing PCBs.

The 2019 change in legislation gave NGED and the other UK DNOs a massive problem to solve. We could either remove or replace all assets made before 1987 at huge cost. With increased supply interruptions for customers and environmental impacts associated with manufacturing hundreds of thousands of new assets, while disposing of the old ones. Alternatively, we could collaborate and innovate to do something different.

In 2018, before the new legislation came into force, NGED led the creation of an industry wide working group to find a sustainable solution to this PCB problem.

Since 2018, the Energy Networks Association PCB Strategy Group, chaired by a member of the NGED Environment Team, has used statistical analysis of historic PCB test results. It identifies assets that are most at risk of contamination and target their testing or replacement.

The work has also involved close collaboration with the UK's environmental regulators, with NGED working closely with both the Environment Agency (EA) and Natural Resources Wales (NRW).

This collaboration has led to the identification of tens of thousands of low risk assets that can now continue to be utilised until the end of their useful life. Saving >£1BN of replacement costs across the UK, along with >400,000 tonnes of CO_2.

This ENA group won recognition for their work with the award for Utility Week's Collaborative Excellence in 2023. This project has set a precedent by the Environment Agency as an example of regulators and businesses working together for the benefit of the environment.

NGED continue to work closely with other DNOs and regulators, as the ban on PCBs rapidly approaches, and comes into force on 31st of December 2025.

We are driving an ambitious work program with targeted testing and replacement to ensure our network is PCB free prior to this deadline. All whilst ensuring that costs, customer interruptions and manufacturing carbon emissions and resource use are kept to an absolute minimum.

Persistent Organic Pollutant Reporting 2023/24

177

persistent organic pollutant remedial asset changes. The wholesale replacement of assets that contain, or (where it is not possible to test) are suspected of containing, unacceptable levels of persistent organic pollutants (POPs) such as polychlorinated biphenyls (PCBs).

23,831

persistent organic pollutant assets negative or statistically likely to be negative. The levels of persistent organic pollutants (POPs) such as polychlorinated biphenyls (PCBs) are acceptable.

1,792

persistent organic pollutant oil tests. The testing of oil specifically carried out to determine levels of persistent organic pollutants (POPs) such as polychlorinated biphenyls (PCBs).

Reducing our environmental impact
Our Wider Commitments

Community Engagement

The Heart of England Forest (HoEF) is a charity aimed at preserving and enhancing a 7,000-acre forest situated across the Worcestershire-Warwickshire border. As part of the ongoing collaboration agreement between NGED and HoEF we will continue to support, develop and protect the forest within a wide range of projects. These projects focused on an area of the forest known as 'The Lenches'.

NGED Apprentices have created site access improvements for communities via construction of a boardwalk, allowing all year round access for the local community through a wet section of woodland. Managing the vegetation to encourage diverse plant and animal life in and around the pond ecosystems, helping to boost restoration of the wetlands and ponds.

NGED Volunteers have contributed to the 150 acres of new native woodland by tree planting. The creation of this new woodland habitat will enhance community amenity value and enable further volunteering opportunities for NGED employees, allowing many more people to engage with nature. The trees planted are without plastic shelters, further reducing the environmental impact.

We will also help deliver and support 168 acres of conservation grazing at The Lenches, where rare breed cattle maintain open spaces within the forest. These areas are vital for species that depend on open habitats such as wildflowers, butterflies and ground nesting birds.

The collaboration has also included the funding of staff roles for a Forest Ranger and Assistant Forest Ranger, to manage the tree planting and maintenance. Not only do these roles provide the support needed for volunteer activities, they will also facilitate biodiversity surveys including bird, reptile, butterfly, invertebrate, mammal and plant species to monitor and report on improvements.

Our Heart of England Forest 2023/24 Project Report is available in Appendix B.

Reducing our environmental impact
Our Wider Commitments

National Grid Electricity Distribution Apprenticeship Scheme Community Project - June 2023
The Heart of England Forest

In June 2023 45 NGED Craft Apprentices travelled to two wooded areas near Redditch to take on a week-long challenge aimed at building teamwork skills, while contributing to the local community.

Dorothy's Wood and Morgrove Coppice in the Heart of England Forest benefitted from two new walkways made from recycled materials, allowing locals, including pram- and wheelchair-users, to navigate renowned mud spots and safely access the forest all year round.

Reducing our environmental impact
Our Wider Commitments

Community Matters Fund

In 2023/24 NGED's Community Matters fund focused on providing financial support to Green Spaces. The fund provided £500,000 to over 103 local charities and organisation to improve local environmental and sustainability initiatives and projects.

Solar on schools and community buildings

We're committed to bringing customers and communities along with us on the journey to net zero, through renewable energy and education.

We are doing this by directly investing £2.7m by 2028 in solar panels for schools and community buildings in our operating region, along with education and outreach to engage students in areas of high economic deprivation with STEM subjects and build National Grid's talent pipeline.

The first two solar installations and educational outreach sessions were recently completed at Ark Kings Academy and Ark Victoria Academy in Birmingham.

Donation of decommissioned company devices

We completed a successful pilot, donating 465 iPads to 42 charities in 2023. We have now embedded the process to ensure all decommissioned company iPads are repurposed this way.

We will donate approximately 3,000 iPads this year – reducing electronic waste by extending the lifespan of these devices through refurbishment and donation.

COMMUNITY MATTERS FUND

Managing our environmental impact
Compliance and Competency

Our Environmental Management System

In 2023/24 NGED successfully underwent its external ISO 14001 and EU Skills Permit Competence Management System (CMS) recertification audits. The EU Skills CMS covers the oil related environmental permits in place within NGED.

The audits covered Head Office activity at Avonbank and Pegasus, a selection of depots in the East Midlands (Alfreton, Leicester, and Derby) and Wales (Ty Coch, Lamby Way and Withybush) as well as the Tipton Depot in the West Midlands. These resulted in eight minor non-conformances relating to ISO 14001 and a number of Opportunities for Improvement (OFIs).

The minor non-conformances revolved around waste records and air conditioning maintenance records, all the issues identified were successfully closed out with our external auditors. New certificates for both our ISO14001 and CMS have been issued to all applicable NGED sites.

While ISO14001 is well established within NGED the EU Skills CMS management system has only recently been introduced, following a move away from the WAMITAB system of demonstrating permit competence.

The successful audit outcome reflects NGED's strong performance on permit management and compliance within permitted depots, having embraced the new system fully.

Further improvements to the CMS are planned in terms of widening the staff groups involved in permit management throughout 2024/25.

Five key approaches for ISO14001:2015

Greater protection for environment
Proactive initiatives, objective measurements and improving environmental performances.

Effective communication and awareness
Driven through a communication strategy and its effectiveness.

Focus on strategic fit and risk management
An increased alignment with unique context, strategic direction and risk orientation.

Life cycle perspective
Each stage of a product or service; from development to end-of-life is on focus.

Emphasis on leadership
Greater commitment from the top management.

Managing our environmental impact
Compliance and Competency

Training

Ensuring and maintaining that all of our employees are aware of their environmental responsibilities and the impact that their activities could potentially have on the environment is a key requirement of ensuring that we minimise the impact we as a business have on the environment.

Throughout 2023/24 we have delivered environmental awareness training throughout the organisation, many courses being tailored to specific operational needs. We have also spent more time in the business engaging directly with staff and colleagues at local offices and depots. Furthermore we have utilised other platforms to engage employees in environmental management including recording a selection of podcasts and informational videos on topics such as net zero, biodiversity and waste.

Safety, Health and Environment (SHE) Conferences 2023/24

Conferences have been held in person at locations across each of our four licence areas, attendance at each event being approximately 150 people.

Each Conference has been well supported by NGED senior management with both NGED employees and many of our contractors attending. Environmental sustainability is an established agenda item at every NGED SHE Conference and during 2023/24 there have been presentations delivered and roundtable discussions on a wide range of topics including:

- biodiversity net gain.
- resource management and circular economy.
- achieving net zero.

Appendix A
Annual Environment Report KPI Tables

Business Carbon Footprint Scope 1 & 2

Category	Sub-Category	Total Baseline Reduction Target tCO_2e RIIO-ED2 2028	Unit	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
Operational Transport	Total	17,356.50	tCO_2e	19,097.01	-	-	-	-
	Road	16,025.72	tCO_2e	17,948.72				
	Marine	2.40	tCO_2e	2.41				
	Air	1,328.38	tCO_2e	1,145.88				
Building Energy Usage	Total	8,516.10	tCO_2e	16,910.48	-	-	-	-
	Electricity	3,015.16	tCO_2e	4,888.77				
	Other fuels	0.00	tCO_2e	0.00				
	Substation electricity	4,908.08	tCO_2e	11,634.08				
	Gas	592.87	tCO_2e	387.63				
Fuel Combustion	Total	1,505.77	tCO_2e	1,458.83	-	-	-	-
	Diesel (excluding transport)	1,505.77	tCO_2e	1,458.83				
	Diesel (embedded stations)	0.00	tCO_2e	0.00				
	Other	0.00	tCO_2e	0.00				
Fugitive Emissions	Total	10,402.47	tCO_2e	8,117.67	-	-	-	-
	SF_6	10,402.47	tCO_2e	8,117.67				
	Other IIG	0.00	tCO_2e	0.00				
Total Scope 1 and 2 Emissions (Excluding Losses)		37,780.85	tCO_2e	45,584.00	-	-	-	-
Electricity Distribution Losses		416,013.64	tCO_2e	782,802.67				
Total Scope 1 and 2 Emissions (Including Losses)		453,794.48	tCO_2e	827,492.16	-	-	-	-

Appendix A
Annual Environment Report KPI Tables

SF_6 - LV

Category	Voltage	Sub-Category (where applicable)	Unit of Measure	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
SF_6 Bank	LV	Total no. of assets containing SF_6	No. of Assets	0.00				
		Total amount of SF_6 on network	kg	0.00				
		No. of SF_6 assets replaced (per annum)	No. of Assets	0.00				
		No. of SF_6 alternative assets (per annum)	No. of Assets	0.00				
		% of assets containing SF_6 (% of bank)	%	0.00				
		No. of SF_6 assets installed (per annum)	No. of Assets	0.00				
SF_6 Emissions	LV	Leakage (per annum)	kg	0.00				
		Leakage rate (% of bank)	%	0.00				
		Interventions (per annum)	#	0.00				
		Impact of Interventions	kg	0.00				

Decarbonisation targets and metric to end of RIIO-ED2 for SF_6 (all voltages) is yet to be determined.

Appendix A
Annual Environment Report KPI Tables

SF_6 - HV

Category	Voltage	Sub-Category (where applicable)	Unit of Measure	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
SF_6 Bank	HV	Total no. of assets containing SF_6	No. of Assets	60,032.00				
		Total amount of SF_6 on network	kg	50,938.67				
		No. of SF_6 assets replaced (per annum)	No. of Assets	566.00				
		No. of SF_6 alternative assets (per annum)	No. of Assets	0.00				
		% of assets containing SF_6 (% of bank)	%	38.94				
		No. of SF_6 assets installed (per annum)	No. of Assets	24,30.00				
SF_6 Emissions	HV	Leakage (per annum)	kg					
		Leakage rate (% of bank)	%					
		Interventions (per annum)	#	4.00				
		Impact of Interventions	kg	1.78				

Decarbonisation targets and metric to end of RIIO-ED2 for SF_6 (all voltages) is yet to be determined.

Appendix A
Annual Environment Report KPI Tables

SF_6 - EHV

Category	Voltage	Sub-Category (where applicable)	Unit of Measure	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
SF_6 Bank	HV	Total no. of assets containing SF_6	No. of Assets	4,307.00				
		Total amount of SF_6 on network	kg	19,968.79				
		No. of SF_6 assets replaced (per annum)	No. of Assets	74.00				
		No. of SF_6 alternative assets (per annum)	No. of Assets	0.00				
		% of assets containing SF_6 (% of bank)	%	8.15				
		No. of SF_6 assets installed (per annum)	No. of Assets	264.00				
SF_6 Emissions	HV	Leakage (per annum)	kg					
		Leakage rate (% of bank)	%					
		No. of SF_6 assets replaced (per annum)	#					
		Interventions (per annum)	#	62.00				
		Impact of Interventions	kg	44.28				

Decarbonisation targets and metric to end of RIIO-ED2 for SF_6 (all voltages) is yet to be determined.

Appendix A
Annual Environment Report KPI Tables

SF_6 - 66kV

Category	Voltage	Sub-Category (where applicable)	Unit of Measure	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
SF_6 Bank	66kV	Total no. of assets containing SF_6	No. of Assets	212.00				
		Total amount of SF_6 on network	kg	43,13.37				
		No. of SF_6 assets replaced (per annum)	No. of Assets	2.00				
		No. of SF_6 alternative assets (per annum)	No. of Assets	0.00				
		% of assets containing SF_6 (% of bank)	%	97.71				
		No. of SF_6 assets installed (per annum)	No. of Assets	10.00				
SF_6 Emissions	66kV	Leakage (per annum)	kg					
		Leakage rate (% of bank)	%					
		No. of SF_6 assets replaced (per annum)	#					
		Interventions (per annum)	#	7.00				
		Impact of Interventions	kg	11.78				

Decarbonisation targets and metric to end of RIIO-ED2 for SF_6 (all voltages) is yet to be determined.

Appendix A
Annual Environment Report KPI Tables

SF_6 - 132kV

Category	Voltage	Sub-Category (where applicable)	Unit of Measure	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
SF_6 Bank	132kV	Total no. of assets containing SF_6	No. of Assets	953.00				
		Total amount of SF_6 on network	kg	29,520.72				
		No. of SF_6 assets replaced (per annum)	No. of Assets	3.00				
		No. of SF_6 alternative assets (per annum)	No. of Assets	0.00				
		% of assets containing SF_6 (% of bank)	%	90.25				
		No. of SF_6 assets installed (per annum)	No. of Assets	31.00				
SF_6 Emissions	132kV	Leakage (per annum)	kg					
		Leakage rate (% of bank)	%					
		No. of SF_6 assets replaced (per annum)	#					
		Interventions (per annum)	#	37.00				
		Impact of Interventions	kg	37.83				

Decarbonisation targets and metric to end of RIIO-ED2 for SF_6 (all voltages) is yet to be determined.

Appendix A
Annual Environment Report KPI Tables

Category	Voltage	Sub-Category (where applicable)	Unit of Measure	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
IIG Name [DO NOT DELETE IF NOT USED]	LV	No of Assets with IIG	#	0.00				
		Amount of IIG	kg	0.00				
		Global Warming Potential of IIG	CO2 Comparison Constant	0.00				
		Leakage	kg	0.00				
IIG Name [DO NOT DELETE IF NOT USED]	HV	No of Assets with IIG	#	0.00				
		Amount of IIG	kg	0.00				
		Global Warming Potential of IIG	CO2 Comparison Constant	0.00				
		Leakage	kg	0.00				
IIG Name [DO NOT DELETE IF NOT USED]	EHV	No of Assets with IIG	#	0.00				
		Amount of IIG	kg	0.00				
		Global Warming Potential of IIG	CO2 Comparison Constant	0.00				
		Leakage	kg	0.00				
IIG Name [DO NOT DELETE IF NOT USED]	132kV	No of Assets with IIG	#	1.00				
		Amount of IIG	kg	1.20				
		Global Warming Potential of IIG	CO2 Comparison Constant	0.00				
		Leakage	kg	0.00				

Appendix A
Annual Environment Report KPI Tables

Losses

Electricity Distribution Losses	Target RIIO2-ED2 2028	Unit	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
Annual Losses	2,009.01	GWh	3,780				
Share of Total Electricity Distributed	25%	%	25%				
Carbon Equivalent	416,013.64	tCO_2e	782,803				
Annual Interventions completed	TBC	#	12				
Impact of Interventions (per annum)	TBC	MWh	Not known				
Impact of Interventions (per annum)	TBC	tCO2e	Not known				

Interventions

Description	Unit	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
Cable LV Uprate 95mm² to 185mm²	km	581				
Cable 11kV Uprate 95mm² to 185mm²	km	652				
Transformers - Pre 1958 GMT sole EM	#	81				

RIIO-ED2 targets for Interventions are yet to be confirmed.

Appendix A
Annual Environment Report KPI Tables

Supply Chain

Supply Chain Management	Unit	Target by end of RIIO-2 ED2 2028	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
Percentage of suppliers meeting licensees supplier code	Cumulative % by Annual Spend	80%	25%*				

* annual estimate to be confirmed in 2025/26

Resource Use and Waste

Waste Destination - Non Hazardous/Non Special	Unit	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
Total Waste Produced directly by Licencee	Tonnes	5,310				
% Reused/Recycled	%	28.28				
% Energy from Waste	%	66.94				
% Sent to Landfill	%	3.48				
% Other	%	1.3				
% of Waste Diverted from Landfill (excluding compliance waste)	%					

Waste Destination - Non Hazardous/Non Special	Unit	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
Total Waste Produced directly by Licencee	Tonnes	1,033.97				
% Reused/Recycled	%	11.64				
% Energy from Waste	%	87.89				
% Sent to Landfill	%	0.47				
% Other	%	0				
% of Waste Diverted from Landfill (excluding compliance waste)	%	99.53				

Appendix A
Annual Environment Report KPI Tables

Visual Amenity

Visual Amenity Scheme	Unit	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
Removal of overhead lines (due to a visual amenity scheme)	km	4.35				
No. of Amenity Schemes	#	4				
Other (if applicable)		66.94				

Noise Pollution

Noise	Unit	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
No of Complaints Received	#	41				
No of Complaints Leading to Intervention	#	12				

Fluid Filled Cables (FFC)

Sub Category	Unit	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
FFC in service	km	683				
Oil in Service	Litres	1,663,150				
Cable Oil Top Up	Litres	9,301				
Fluid Used to Top Up Cables as a percentage of volume in service	%					
Removal of FFC	km	2				
Leak Reduction	Litres	15,032				
Oil Recovered	Litres	550				

Appendix A
Annual Environment Report KPI Tables

PCBs

PCBs - Pole Mounted Transformers	Unit	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
No. of assets PCB contaminated or statistically likely to be contaminated (i.e. no. remaining on PCB register held with environmental regulator)	#	9,512				
No. of assets PCB negative or statistically likely to be negative (i.e. no. that can be removed from PCB register held with environmental regulator)	#	22,632				
No. of asset replacements due to known or statistically likely PCB contamination	#	69				
No. of assets tested to confirm levels of PCB contamination	#	514				

PCBs - Ground Mounted Transformers	Unit	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
No. of assets PCB contaminated or statistically likely to be contaminated (i.e. no. remaining on PCB register held with environmental regulator)	#	7,790				
No. of assets PCB negative or statistically likely to be negative (i.e. no. that can be removed from PCB register held with environmental regulator)	#	974				
No. of asset replacements due to known or statistically likely PCB contamination	#	27				
No. of assets tested to confirm levels of PCB contamination	#	1,046				

PCBs - Other assets	Unit	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
No. of assets PCB contaminated or statistically likely to be contaminated (i.e. no. remaining on PCB register held with environmental regulator)	#	914				
No. of assets PCB negative or statistically likely to be negative (i.e. no. that can be removed from PCB register held with environmental regulator)	#	225				
No. of asset replacements due to known or statistically likely PCB contamination	#	81				
No. of assets tested to confirm levels of PCB contamination	#	232				

Appendix B
Heart of England Report 2023-24 Project Report

Between 1st April 2023 and 31st March 2024 Heart of England's support across our hub at The Lenches helped us to:

- Strengthen forest understanding, response and resilience against pests and diseases.
- Boost and support native species growth and healthy woodland management across 700 acres.
- Conduct targeted surveys. Information gathered over time, as part of long-term monitoring, will help with gauging the need to alter conservation land management for the benefit of wildlife/biodiversity.
- Enhance pond light levels for aquatic life across three ponds.
- Reduce algal blooms in ponds across three ponds.
- Manage habitats to increase insect populations, aiding pollination.
- Support brown hairstreak butterfly habitat management.
- Upgrade fencing to enable conservation grazing.
- Improve grassland management to increase botanical diversity.
- Fund four months of Volunteer support resource for delivery days two times a week.
- Fund the salary of the Forest Ranger responsible for The Lenches as well as additional resource support across the year from the Assistant Forest Ranger and Forest Project Manager to scope, brief and deliver the projects.

Appendix B
Heart of England Report 2023-24 Project Report

Heart of England Forest activity	Report/Benefits	Timings/completed by	Evidence provided	R	A	G
Ongoing forestry team resource support, enabling them to manage and maintain the entire site and nurture our newest 'hub' at The Lenches, covering over 700 acres. **This includes organising the design, planning and relevant permissions to establish nurture and manage The Lenches over 700 acres.**	• A considerable amount of woodland creation and maintenance activity was carried out across The Lenches between April 2023 and March 2024. This included: • Assessment of plantation sites and calculation of tree stocking density covering the entirety of the plantations at Sheriffs Lench (68.38 hectares). HoEF volunteers assisted with this work. • Orchard planting for agroforestry. An area of the 8.2-hectare site has been planted with 3 new rows of trees (100 in total). HoEF volunteers assisted with this work. • Deer fence checks and repairs (as required) every two weeks covering 5km of fence each time. • Ongoing tree guard maintenance by Forestry staff and HoEF volunteers. This is a large job and is done as required. • Maintenance of public access areas at Sheriffs Lench, Ab Lench and Naunton Beauchamp – includes mowing pathways, cutting back overgrown vegetation, and ensuring good access. Approx every 3-4 weeks. • Spot spraying around trees in the Forest in the Spring, to eliminate grass and weed competition. • Assessing tree health on an ongoing basis. • Gaining permissions from the Worcestershire County Council for work in the Forest on trees under tree protection orders. **Benefit of this work: Establishing, nurturing, managing, and maintaining The Lenches over 700 acres to ensure its sustainability and maximise its benefits to the environment, wildlife and people.**	April 2023 - March 2024 – throughout year	Photos/video to be sourced			◆

Appendix B
Heart of England Report 2023-24 Project Report

Heart of England Forest activity	Report/Benefits	Timings/completed by	Evidence provided	R	A	G
Vegetation management including the reduction or pollarding of trees to increase sunlight penetration and reduce leaf litter in ponds.	We hired in a Mobile Elevated Work Platform for a week to enable the reduction of an Ash tree at risk of falling into a neighbour's garden at Sheriffs Lench. **Benefit: Pollarding and weight removal activity was conducted to encourage new shoots and to retain mature tree features for bat roosting and bird nesting.**	September	Photos of MEWP			◆
Wetland restoration of 3 ponds to bolster biodiversity, located at: ///kept.quilting.opera ,///fixtures. motive.bubble ///stable.published. postcard.	The Forestry and biodiversity teams cleared and restored three ponds and managed the vegetation to encourage plant and animal life to thrive in and around the pond ecosystems. **These ponds can now be more easily surveyed and nutrient levels controlled to prevent algal blooms through careful vegetation controls.**	September	Photos of MEWP			◆
Calcareous grassland management at Sheriffs Lench.	A specialised contractor spent 5 days clearing an area of dense bramble using a Robomower, to create a mosaic of open spaces, crucial for supporting a diverse insect population. **Benefit: The aim of this work is to prevent the dominance of scrub within the calcareous grassland and maintain high species richness essential for ecological balance.**	Work was completed by mid Sept	Robo-mower photo/ video footage			◆
Grassland restoration at Roundhill Woods to benefit species such as the brown hairstreak butterfly.	The Biodiversity and Forestry Teams and volunteers conducted the clearance of a wayleave at Roundhill Wood to rejuvenate the grassland, coupled with rotational coppicing of blackthorn scrub **to benefit insects particularly the brown hairstreak butterfly.**	Aug to Oct 2023	Photos/ongoing species survey results over the years			◆
Grassland restoration at Roundhill Woods to benefit species such as the brown hairstreak butterfly.	Brown Hairstreak Butterfly egg surveys took place in the winter of 2023/2024. 30 eggs were found. They also managed competing scrub and aggressive grass species to ensure the survival and spread of native wildflowers. **Benefit: This work benefits woodland insects particularly woodland butterflies such as wood white and brown hairstreak. It is anticipated this wayleave conservation management work should contribute to increasing the population of these butterflies in future years.**	Winter 2023/24	Photos/ongoing species survey results over the years			◆

Appendix B
Heart of England Report 2023-24 Project Report

Heart of England Forest activity	Report/Benefits	Timings/completed by	Evidence provided	R	A	G
Conservation grazing: Infrastructure enhancement at Naunton Beauchamp.	Installation of new stock fencing and gates for improved livestock movement as well as vehicular access, enhancing the functionality of the site. 521 metres of existing fence was removed and disposed of and 521 metres of strained high tensile stock netting with two top lines of high tensile barbed wire was installed. 1x12ft galvanised field gate hung on ditch boundary and 1 x customer supplied gate was rehung by pond.	Winter 2023/24	Photos			◆
Regular grazing and hay cuts at Naunton Beauchamp which are essential for nutrient management, conducive to wildflower meadow health. Using sheep as natural seed dispersers is expected to organically expand wildflower presence across the site.	Sheep grazing took place on 15.19 hectares (37.53 acres) at Naunton Beauchamp with the objective being to graze with sheep, make hay from SSSI fields and feed the hay from SSSI fields to sheep in non SSSI fields to transfer wildflower seeds and improve floristic diversity across the site. By year 3 we aim to have at least two high-value indicator species for BAP grassland habitats on our lowland meadows and pastures with at least 40% of wildflowers flowering between May-June. **Benefit: Bolstering floristic diversity within SSSI fields and propagating wildflowers.** **Issues: Weather and ground conditions delayed hay making and aftermath grazing.** **Successes: Grazing and hay making was successful on site. More yellow rattle has been observed in one field than previous years.**	Winter 2023/24	Photos before and after grazing			◆

Appendix B
Heart of England Report 2023-24 Project Report

Heart of England Forest activity	Report/Benefits	Timings/completed by	Evidence provided	R	A	G
Vegetation surveys at Naunton Beauchamp.	Naunton Beauchamp surveying during 2023-2024: Of the two SSSI meadows, Gravel Pit Meadow had ten positive indicators of lowland meadows recorded and Lower Sagmore had seven, with meadow vetchling, lady's bedstraw, common knapweed meadowsweet being the most frequently recorded of these across both meadows. Of the two non-SSSI grasslands, Long Meadow had two positive indicators (goat's-beard and yellow rattle, the latter frequent in eastern portion of the field) and very frequent meadow buttercup, while compartment 33 was much poorer with mainly grasses and occasional white clover (a negative indicator) and meadow buttercup, with some small patches of lady's bedstraw (a positive indicator).					◆
Monitor and record progress and milestones to provide an update and impact report on the project once complete.	See above.	Sept 2024			◆	

A total of 362 volunteer work hours took place across The Lenches in 2023-2024. These were organised and overseen by our Volunteer Team and included a variety of activities including tree guard removal and replacement, orchard planting and biodiversity surveys.

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