

**Electricity
Transmission**

nationalgrid

September 2023

Our Annual Environmental Report



About this report

Welcome to our Annual Environmental Report, the second in our current regulatory period.

Our report provides a progress update in achieving our environmental commitments, as set out in our Environmental Action Plan, and the impacts on the environment from our network.

The scope of this report is focused on performance data for the financial year reporting period 1 April 2022 to 31 March 2023 (FY23); however, future activities are also described. The focus of this report is solely on National Grid Electricity Transmission's (NGET's) activities.

This report is supported by a Methodology Annex which details the scope and boundaries of our environmental commitments in addition to assumptions made around our calculation and measurement methods.

How to use this document



Home

This will take you to the home page.



Arrows

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Reveal/hide

Hover over the magnifying icons to reveal hidden content.

'Linked' content

Words that are underlined have links to other pages in this document, or are URLs.



Our business

We are National Grid Electricity Transmission plc (NGET)

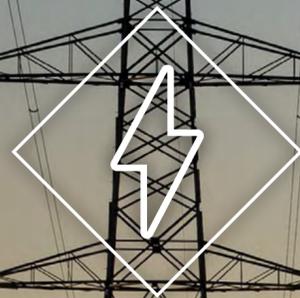
We own and maintain the high-voltage electricity transmission network in England and Wales.

What we do

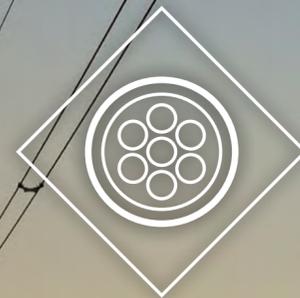
We move electricity from where it is generated to where it is needed. We are responsible for transporting the electricity generated from windfarms and power stations safely and efficiently through our network onto the distribution system, so that it reaches homes and businesses reliably.

Our environmental responsibilities

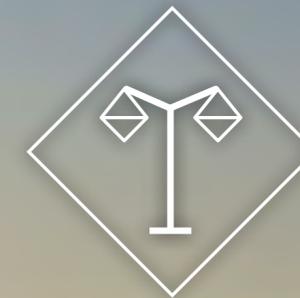
Our vision is to be at the heart of a clean, fair and affordable future. We will do this by connecting increasing amounts of renewable energy, managing the environmental impact of our network, and supporting long-term decarbonisation goals. Our view is that net zero is achievable, and with the right policy, we can make it affordable for all.



Over 300
substations



c. 440 miles of
underground cable



c. 4,400 miles
of overhead line

Welcome to our Annual Environmental Report 2023

Our Annual
Environmental
Report
2023



With the effects of climate change now upon us, we're absolutely committed to delivering a clean energy future while reducing our own emissions, protecting the environment, and investing in green infrastructure.”



Our electricity network continues to transition to a cleaner, greener future

I am delighted to welcome you to our Annual Environmental Report 2023.

Two years into this regulatory period, we remain steadfast in our commitments.

We remain committed to play our part in the climate crisis and make a meaningful contribution to lowering emissions, not just for National Grid as a company, but for the energy sector in the broadest sense. This means delivering the energy transition at pace.

We are responsible for building the networks that will support a net zero economy by 2050. This year, we had the go-ahead for 17 major new projects to connect low-carbon power to our network. These projects are a vital part of achieving the UK government's ambition of connecting 50 GW of offshore wind by 2030.

We want to lead the way in creating a better and more sustainable world. We remain focused on getting our own house in order. We are doing this by putting sustainability at the heart of our operations.

We have...



reduced our scope 1 and 2 emissions by 19.1%



and we are on track to reach our target of 50% by 2030

in line with limiting greenhouse gas emissions to a 1.5°C warming scenario. We are doing this by reducing the emissions from SF₆ and eliminating it from any new projects.

Innovation plays a key role in how we decarbonise our networks. I am incredibly proud of our ongoing focus in innovation this year. We are collaborating with our supply chain to be a leader in sustainability, particularly in our approach to sulphur hexafluoride (SF₆)-free technologies and low-carbon concrete in our construction projects.

We understand how vulnerable our natural environment is to climate change and I am pleased with our continued progress in this area. All our construction projects that have an impact on the natural environment have made commitments and developed plans that will deliver a measurable improvement to biodiversity by at least 10 per cent and we are targeting even greater gains as we develop our approach in partnership with other organisations.

We are proud of the progress we have made on our sustainability journey this far. But it's a long and ambitious path, and we know there is more work to be done on all fronts. We are firmly focused on achieving all our commitments and making the right long-term investments that support the sustainability of our business for decades to come.



Alice Delahunty

Alice Delahunty
President, Electricity Transmission

Our environmental vision – FY23 Update

Significant changes must be made in order to reduce harmful emissions and the deterioration of the natural world.

That's why we have set ourselves ambitious environmental commitments within our Environmental Action Plan that respond to this call to action.

Our **Environmental Action Plan** concentrates on four priority areas where we can make the greatest contribution to a more sustainable future, aligned to the United Nations' Sustainable Development Goals.

Since our first **Annual Environmental Report**, changes to the external environment have encouraged us to review and refine our strategy, including some of our environmental commitments. This year, we added four new commitments to our Environmental Action Plan. Roll over the icons to see our new commitments.





Net zero carbon emissions

Hover over for more information:



Our 2026 commitments

To enable effective monitoring of objectives and measures, the following RAG status definitions are used:

🔍 Roll over the panels below to find out how we performed over FY22 and FY23.

G

Progress against the implementation milestones is on track

A

Progress is delayed but it is likely to be achievable before the end of the regulatory period

Our contribution to a decarbonised energy system

In 2023, the UK hit a major milestone. One trillionth kilowatt hours (kWh) of electricity has been generated from renewable energy sources, the equivalent of everyone in the UK watching every James Bond movie 13 times a day, every day for a year.

It has taken 50 years to reach this milestone, and based on current projections, will take just over five years to reach the next trillionth kWh.

We expect demand for electricity to rise as the transport and heat sectors become increasingly electrified. To help meet this demand, we are connecting renewables as quickly and efficiently as possible and investing in grid modernisation.



FY23 low-carbon connection performance

Hover over the top three panels for more information.



1.5 GW
low-carbon and renewable energy capacity planned for FY24.



7.2
was our quality of connections score.



20.8 GW
of low-carbon and renewable energy capacity connected.



37.7%
of the generation connected to our network is low-carbon.



69 days
Number of days on average it took to develop and issue a customer offer.



734
connection offers made, this is almost triple the previous year.



17
Go ahead for 17 major new projects to connect low-carbon power to our network.

The Great Grid Upgrade

In FY23, we had the go-ahead for 17 major new projects to connect low-carbon power to our network. These projects are a vital part of achieving the government's ambition of connecting 50 GW of offshore wind by 2030.

This is the largest transmission growth the UK has seen for 50 years. We are calling this the Great Grid Upgrade. In order to achieve this, we have created a new business unit within National Grid Electricity Transmission (NGET), Strategic Infrastructure (SI), which is responsible for delivering these major new projects.

They will be delivered under the regulator's Accelerated Strategic Transmission Investment (ASTI) framework.

Strategic Infrastructure will work closely with the Electricity Transmission (ET) business unit to ensure efficient and effective delivery and will transfer the projects over to ET once they're complete and ready to be accepted onto the wider network.

ET will then be responsible for the ongoing operation and maintenance of the infrastructure when in service. Delivery of these projects will help cut emissions and deliver net zero, as well as lower consumer bills and underpin the UK's energy security by boosting homegrown renewable energy generation.

For more information, please [click here](#).



The government ambition of 50 GW of offshore wind by 2030 demands unprecedented scale and complexity of action. **It's essential that we unite as a sector and as an industry to rise to this challenge.**

Matt Staley, Director of Onshore Delivery at National Grid

Our climate commitment

To avert the worst effects of climate change, the world needs to transition to net zero by 2050*.

We have committed to this, with interim targets of:

34% reduction by 2026, and

50% reduction by 2030

These targets are from a FY19 baseline, and they exclude emissions from electricity transmission losses.

Understanding our scope 1 and 2 emissions

Our scope 1 emissions relate to fugitive emissions from the leakage of sulphur hexafluoride (SF₆) used as an insulating gas in high-voltage equipment (approximately 92 per cent of our emissions) and the fuel we use for business transport (approximately 2 per cent of our emissions).

Our scope 2 emissions relate to the energy used in our buildings (approximately 6 per cent of our emissions) and transmission losses, which we report but don't account for in our Environmental Action Plan (EAP) target.

FY23 performance

Our controllable scope 1 and 2 greenhouse gas (GHG) emissions were 241,723 tCO₂e, a 19.1 per cent decrease against our FY19 baseline set out in our EAP.

We have made every effort this year to achieve significant reductions in our business carbon footprint across our scope 1 and 2 emissions; our largest percentage reduction was in relation to the energy we use in our buildings. We have reduced our Insulating and Interruption Gas (IIG) emissions by almost 50,000 tCO₂e.



19.1% reduction in our scope 1 and 2 emissions

*The Intergovernmental Panel on Climate Change (IPCC) Special Report on 1.5°C concluded that reaching net zero emissions by the middle of the century would limit global warming close to 1.5°C if coupled with sufficiently ambitious emissions reductions over the coming decade.



It's great working for a company that has such a pivotal part to play in achieving our country's net zero targets but it's also important for us to have our own house in order and reduce the impact we have on global warming."

Paul de Jong, Environment and Sustainability Manager



Transmission losses

Most of our scope 1 and 2 emissions are the result of electricity transmission losses across our network.

However, transmission losses are largely outside our control and are predominantly determined by where electricity is generated (for example, electricity generated closer to where it is needed would result in lower losses across the network).

The growth in large, remote windfarms of recent years has tended to increase transmission losses because, when the wind blows, the power generated needs to be brought to demand, most of which lies around large, heavily populated areas away from the windfarms. However, losses are impacted by the grid electricity carbon intensity (g/CO₂/kWh). We expect emissions from losses to reduce as the carbon intensity of electricity reduces.

Our GHG reduction strategy is therefore focused on the emissions that we can control. We exclude transmission losses from our scope 1 and 2 target but are committed to developing a transmission losses strategy targeted at reducing losses that are in our direct control.



Scope 2 emissions due to network energy losses increased this year

Our emissions from electricity losses increased by 13 per cent from last year, primarily due to increased renewable generation (wind) in the north and higher energy demand in the south.

Our transmission losses strategy

In FY23, we updated our transmission losses strategy which has been signed off at executive level. Our strategy outlines how we account for transmission losses in equipment specifications and procurement processes, as well as when making investment decisions. Furthermore, it details our planned asset replacement programmes and new technologies, allowing us to plan for and mitigate the associated impacts on transmission losses in the future.

Transmission losses are one of several factors considered when selecting the most economic and efficient transmission solutions. The increase in transmission loss (cost) resulting from increased transmission capacity must be considered alongside the capital saving of avoiding new lines built to meet system requirements.

Table 2. Transmission losses



Insulating and interruption gas (IIG) emissions

SF₆ has been used within high-voltage electricity equipment for decades due to its excellent electrical insulating and current interruption properties.

SF₆ is the most potent greenhouse gas with a Global Warming Potential (GWP) of 23,500 times that of carbon dioxide (CO₂). Although equipment containing SF₆ is designed to be effectively sealed, small leaks to the atmosphere do occur, particularly as assets age.

It is the most significant contributor to our business carbon footprint, meaning our transition to net zero is heavily reliant on our SF₆ strategy and performance.

It is our ambition to eliminate SF₆ from our network – and therefore reduce SF₆ emissions to zero – by 2050. We are focusing on leak identification and repair, and investment in SF₆ alternatives.

FY23 performance

Our Insulating and Interruption Gas (IIG) emissions were 223,003 tCO₂e. We achieved a 20.5 per cent decrease from a FY19 baseline and a decrease of 6,774 tCO₂e from FY22. This is 4.5 per cent ahead of our Science-Based Targets (SBT) flightpath for SF₆ emissions reduction representing good progress towards our target.

Our planned leak repair programme has continued to contribute to significant improvements to overall leak rate, and therefore lower emissions.


-20.5% in IIG emissions from FY19 baseline

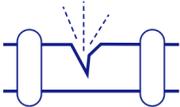

1.01% is our leakage rate

Figure 4. IIG emissions



Case study

Sealing our leaks

A novel anti-leak technology is helping us keep our substations in service during SF₆ repairs. We worked with engineering technology company **Rawwater** to deploy its M3 Molten Metal Manipulation technology, which can be used to seal flowing leaks – a fix that has previously required a planned outage.

Following an initial pilot trial at National Grid’s Deeside Centre for Innovation, and further studies at Cardiff University, Rawwater’s technology has been successfully rolled out in the field at Dinorwig and Sizewell substations – meaning that while leak repairs took place, power could continue flowing to the grid from two of the country’s largest hydroelectric and nuclear plants.

We have a programme of work underway to reduce our dependency on SF₆ technology in England and Wales, but initiatives like this are critical in mitigating its impact in the meantime. See more information [here](#).



Energy usage

We own and maintain over 300 substations across England and Wales. Ensuring our offices and substation buildings are sustainable and energy efficient is critical to our efforts in tackling climate change.

Decreasing carbon emissions from our office energy use

Emissions from the energy used in our buildings saw a reduction of 22.7 per cent from a FY20 baseline, compared with 19.3 per cent last year.



-22.7% reduction

In FY23, we reviewed occupation levels in our offices. As a result, we have taken steps to optimise occupancy in our corporate offices and adapt to the changing uses of our work spaces, optimising heating, ventilation, air conditioning and lighting systems to better meet the evolving needs of our colleagues. Investment in energy efficiency measures, such as an LED external lighting upgrade and ongoing focus on controls and behavioural improvement (“off-peak” floor plate closures) has contributed to this reduction in office energy use.

Purchasing 100% renewable energy

The need for sustainable, affordable renewable energy continues to be identified as a key priority for achieving a just, 1.5-degree future. However, in FY23 as a result of the war in Ukraine, the energy market was extremely volatile. This caused us to push back on our Power Purchase Agreement (PPA) target for FY24.



We are on track to purchase 100% renewable energy

Saving energy at our substations

We have partnered with **AECOM** to complete energy efficiency surveys at over 30 substation sites to explore our energy consumption and carbon emissions, including: operational usage, site lighting, and domestic use in site accommodation. We are now in the process of generating reports and commencing virtual site audits.

The recommendations of each survey will guide us in planning the optimal carbon saving and return on each site. We have identified 4 sites to carry out technical and operational studies that will help plan pilot schemes aimed at reducing our emissions and associated costs.



4 sites identified

to implement pilot technologies which will help us to reduce our emissions.

Case study

Trialling zero-emission generators

Powering substations and construction sites with backup diesel generators contributes to the emission of greenhouse and toxic gases. These generators, if replaced by alternatives with a low-carbon footprint, can avoid these harmful emissions, helping us to achieve net zero. In FY23, we made a new commitment to phase out the use of diesel generators where commercially and technically viable.

This year, we investigated the feasibility of using a Hydrogen Power Unit (HPU) as a zero-emission alternative. The HPU was tested with varying loads and durations in a 10-week trial at our Centre for Innovation at Deeside.

Results showed that the HPU responds well to large changes in demand, demonstrating that the HPU can be a viable alternative

zero-emission backup generator. In order to monitor progress, from FY24 we will require our contractors to report on the volume of diesel used per month as well as the use of other fuels that may be used as alternatives. Some of our construction projects: North Wessex Downs, SER3 and Heysham will undertake diesel free trials. See more information [here](#).



Operational travel

Transport makes up 23 per cent of energy-related carbon emissions globally.

Although it only accounts for approximately 2 per cent of our business carbon footprint, it is important that we lead the way in the shift to zero emission vehicles (ZEVs).

That is why we set ourselves two new targets in FY23 to install electric vehicle (EV) chargers at our substation sites and increase our use of ZEVs in the workplace.

Reducing emissions from operational travel

In FY23, emissions from our operational transport decreased by 24.2 per cent from our FY19 baseline due to reduced travel, but also due to a slight increase in our electric fleet.

Putting the brakes on our fleet's carbon emissions

In line with our commitment to replace 60 per cent of our commercial fleet to zero emission vehicles by 2026, 97 (11 per cent) of our light duty fleet vehicles were replaced in FY23 by ZEVs, compared with 92 in FY22. Due to market options, we delayed the purchase of fleet vehicles until we could trial a new model that is better suited to our operational needs.

The first trial vehicle went into operation in 2022 and proved to be successful. Following this, we placed an order of 114 vans in January 2023 for delivery later in 2023. This will make up our deficit in FY23.

We have not found suitable ZEV alternatives to cars such as 4x4s and vehicles fitted with auxiliary power units. These will be replaced with diesel vehicles until market options increase.



447 EV chargers installed at 79 ET sites



71% of managers' company cars are ZEVs

21.5% reduction in carbon emissions from business travel

Reducing emissions from business travel

This year, emissions from business travel saw a reduction of 21.5 per cent on 2013-2020 averages, compared with 39 per cent in FY22. Although our business travel has slightly increased, we are still significantly under our pre-COVID-19 pandemic baseline with employees using digital tools like Teams, to communicate as opposed to driving for short meetings.

Charging our fleet

In support of our ambitious commitments around net zero, we have also now installed 434 AC charging bays and 13 DC charging bays at 79 of our sites which is 30 per cent of our committed total. This is enough EV chargers to save 1,000 tonnes of CO₂ and enable two million EV miles – equivalent to driving around the circumference of the earth at its equator more than 80 times.

Our EV charger programme is enabling more field-based, customer teams to 'go electric' and drive their vehicles sustainably as well as making more chargers available across our office estate.



Birmingham 2022 Commonwealth Games

National Grid was the Official EV Charger Provider for the Birmingham 2022 Commonwealth Games. We loaned 125 dual electric vehicle chargers for this event, supporting the ambition of making this event the most sustainable Commonwealth Games in history.

We arranged for the chargers to be installed to provide 250 charging bays for the vehicles used to transport athletes and VIPs around the games. Following the games, every single charger was decommissioned and relocated to their permanent homes on NGET operational sites.



We are part of the
CLIMATE GROUP
EV100

Scope 3 emissions

As we build the new electricity networks of the future, we have a huge responsibility to cut carbon emissions, innovate and set new standards for the infrastructure industry.

Quantify and reducing Scope 3 Emissions

In 2020, we worked with The Carbon Trust to develop a baseline, and to understand our most material area. These are: purchased goods and services, capital goods, and fuel and energy related activities. We are now working to set up annual reporting of scope 3 over the remainder of our regulatory period, and improving data quality over time. Our baseline assessment, data quality improvement plan and our commitments on scope 3 are included in page 15 of the [Methodology Annex](#).

Capital goods is our largest areas of our scope 3 emissions, and that's why we have set an explicit target to deliver carbon neutral construction by 2026.



153 tCO₂/£m was the carbon intensity of our construction projects

Carbon neutral construction

We report on our capital carbon performance for construction projects that have been contracted from 21 April and have completed in this reporting year.

In FY23, our carbon intensity was 153tCO₂e/£m. Please see page 5 of the [Methodology Annex](#) for more information on our capital carbon methodology. We've looked at where the carbon from these schemes has come from to identify our carbon hotspots and help inform how we target carbon reduction in future projects.

To help drive carbon reductions in our capital projects, we have recruited a new carbon manager with specialist experience and have also launched a new carbon training module to engage our project teams as well as external contractors.

Continual improvement in our carbon reporting tools

In September 2022, we re-engineered our Carbon Interface Tool (CIT). The changes we have made will speed up completion of the tool and provide a better understanding of carbon reductions achieved from a baseline.

Over 50 representatives from contracting organisations attended our engagement sessions, which provided our supply chain with more guidance on our tools, our requirements and our targets.



Working with our supply chain

As part of National Grid Group, we have set a target for 80 per cent of our suppliers by emissions to have or be working towards having a Science Based Target by 2030. We understand members of our supply chain are in different stages on their journey



73% of our UK-allocated suppliers who have submitted their data through CDP have carbon reduction targets

to net zero and we help educate them on areas to focus to reduce their own emissions. We continue to embed sustainability criteria into all elements of our strategic sourcing process.

Carbon reduction in action

Case study

Using ultra-low carbon concrete

In 2021, we set up working groups to review how we could reduce the use of our most carbon-intensive materials, including concrete, steel, aluminium and cables.

Last year we began an ongoing trial of an ultra-low-carbon concrete, Cemfree – which contains no portland cement, and can reduce the CO₂e of concrete by up to 80 per cent. Cemfree slabs were used as a foundation in the construction of the permanent test area at our Centre for Innovation in Deeside. The trial was designed to assess the short-, medium- and long-term performance of the concrete, to give us confidence to roll out more widespread use.

With promising results on the short-to-medium-term testing, further trials on low-risk elements at substation sites are currently in flight. Our results are being shared with the wider construction industry to inform the discussion on these novel materials. More information [here](#).

Using Cemfree for one foundation slab at Deeside has saved approximately 258kg of CO₂ per cubic metre poured in comparison to 100 per cent Portland cement binder. This is the equivalent to saving 15 tonnes of CO₂e emissions.



We have used the lessons learnt from this trial to update our supplier requirements and change our technical specifications to ensure our suppliers use low-carbon concrete when working for National Grid.

Case study

London Power Tunnels 2 – paving the way to net zero

London Power Tunnels 2 is a £1 billion project, to rewire South London via deep underground tunnels.

Starting in 2020 and still in construction, LPT2 has embedded carbon management from the start. By optimising the design, switching to lower-carbon material, and improving the way we deliver, we've achieved an 18 per cent reduction on emissions from our baseline, a saving of 18,867 tCO₂e across our tunnel and shafts works.

In April 2023, the world's largest ever pour of sustainable, cement-free concrete (736m³) was used to fill the base of a 55m-deep tunnel drive shaft at National Grid's Hurst Substation in South London. This is enough to fill around two 25m swimming pools. This concrete reduces carbon by around 64 per cent, saving an estimated 111kg of CO₂ per cubic metre poured in comparison to concrete that would have traditionally been used. More information [here](#).



Cement free

The earth-friendly concrete pour at Hurst Substation was the largest continuous cement-free concrete pour in the world.

Low-carbon innovation

Decarbonising our electricity network provides us with exciting opportunities to invest in new technologies and form strong partnerships with other companies and organisations.

Our innovation and Research & Development (R&D) portfolio enables us to identify and target carbon savings for our operations. We are focusing on areas where we can make the biggest difference, such as our fugitive emissions, diesel usage, and carbon content of our construction materials.



38 NGET innovation projects supporting decarbonisation commenced since 2021

Click [here](#) to see our innovation strategy.



Gold Award for Best Innovation in net zero and sustainability at the annual IET E&T Innovation Awards

The award recognised our work with the University of Manchester to explore SF₆ alternatives.



Innovating to support the low-carbon transition

As part of our regulatory innovation portfolio funded by Ofgem's Network Innovation Allowance (NIA), we invested £6.6m in FY23 on a range of projects aimed at decarbonisation and transitioning the energy system to a net zero future. Over the last 3 years we have spent £15.6m. £1.4m of this was spent on SF₆-related projects which have been looking at reduction, repair and alternatives to SF₆.

We also spent £2.4m on resilience projects, including those that look at the impact of the weather on our assets and the network.

We've been factoring optimal construction practices in relevant innovation projects over the previous price control. In line with net zero construction targets, we've now designed a specific innovation portfolio/programme to explore projects in this area. If successful they can be used on construction schemes and within the business. These projects will also include the impact of natural habitats around our assets.



Climate change resilience

Climate change continues to impact our network and will continue to do so until the environmental impacts it causes can be prevented.

We saw this firsthand last year with the UK's first ever 40°C day. At National Grid we are aiming to increase the resilience of our business by adapting to the impact of a changing climate.



Flooding and erosion dashboard created and rolled out



55 sensor installations to monitor weather and forecast flood/erosion risk underway to approximately 30 targeted pilot sites



Case study

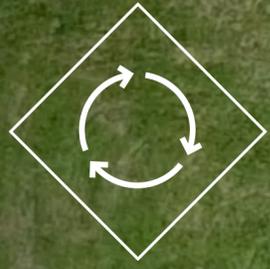
Mitigating the risk for extreme weather events

Vulnerable assets on our network such as substations and towers face an increasing threat from extreme weather-related events, including flooding, severe storms and erosion. To ensure uninterrupted supplies to millions of consumers, we need to find a more effective way to understand and assess environmental risk.

In order to increase our climate resilience, we developed a proof of concept automated weather alert tool. Strategically placed sensors on assets around the network, long term erosion data layer and other relevant open source weather data (API) will feed into the model to improve hazard resilience. The tool will generate real-time alerts alongside a dashboard that provides an instant RAG snapshot of the weather risk picture.

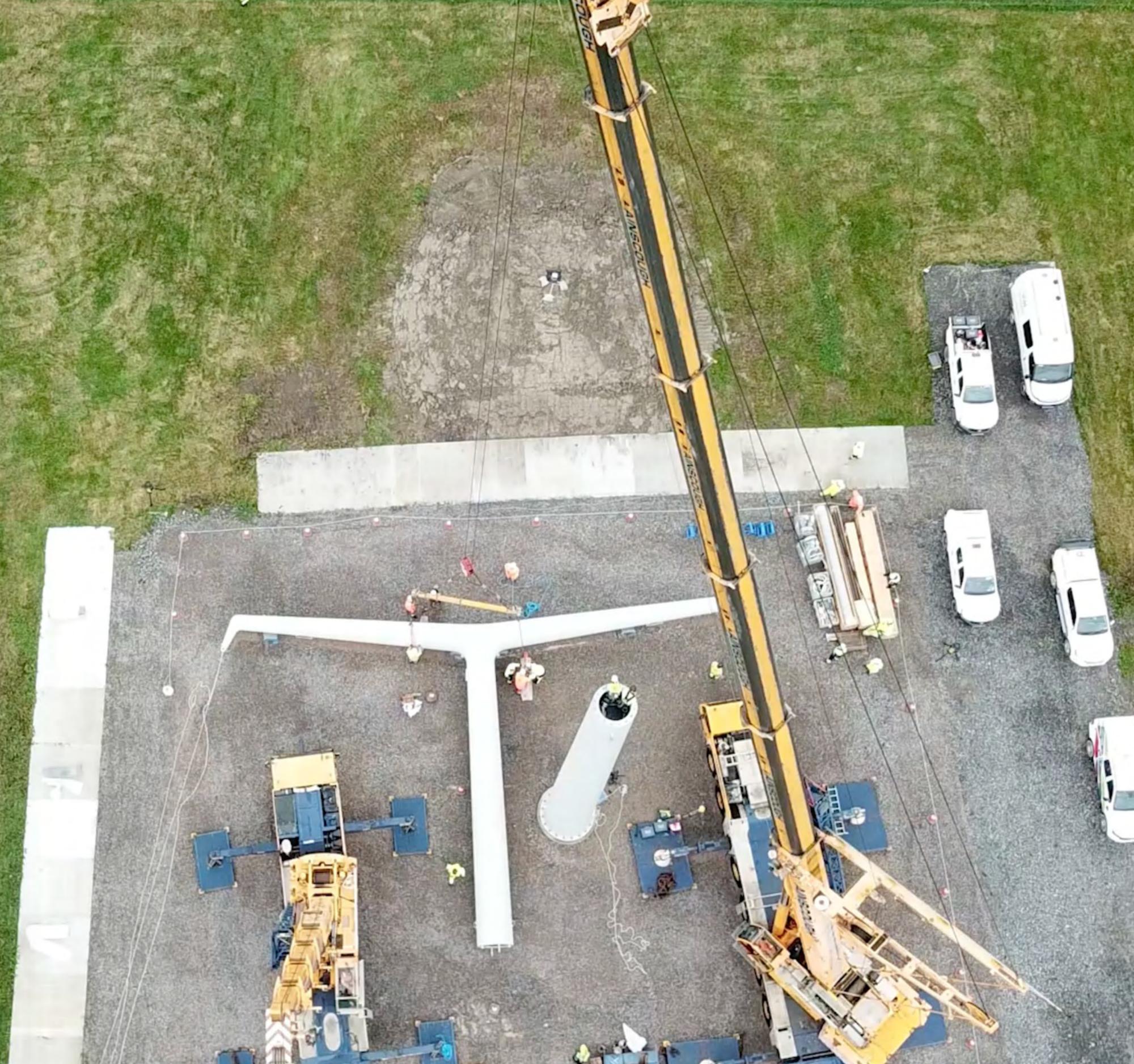
By the end of 2023, we'll see sensors installed on vulnerable assets at around 30 sites as a pilot phase before fully deploying the tool to incorporate more hazards/interfaces and greater part of the network.





Sustainable use of resources

Hover over for more information:



Our 2026 commitments

To enable effective monitoring of objectives and measures, the following RAG status definitions are used:

🔍 Roll over the panels below to find out how we performed over FY22 and FY23.

G

Progress against the implementation milestones is on track

A

Progress is delayed but it is likely to be achievable before the end of the regulatory period

Managing construction waste

Our construction projects produce the largest proportion of waste across our business.

We are prioritising ways to improve our recycling rates, reduce our waste intensity and ensure as much of our waste is diverted from landfill as possible. This is essential to preserving the Earth's natural resources.



99.82% construction waste diverted from landfill



1,419 tonnes/£m construction waste intensity



71.64% of construction waste recycled



Case study

Waste Avoidance Opportunity

This year we introduced the Waste Avoidance Opportunity in our Construction Waste Working Group.

We are unable to set a specific target to reduce our waste intensity due to the nature and diversity of our projects.

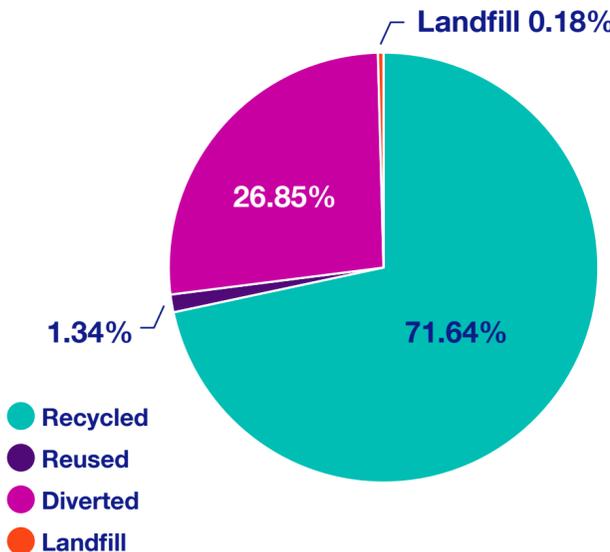
Instead, we introduced the Waste Avoidance Opportunity, which requires all construction projects to identify any changes in process, procedure, or methodology at project design or delivery stage that will prevent the generation of waste and encourage the use of surplus materials.



FY23 performance

We achieved 99.82 per cent landfill diversion across our construction projects. Waste intensity was calculated as 1,419 tonnes per million pounds spent, and 71.64 per cent of construction waste was recycled. Our waste intensity has increased this year and our construction recycling rate has declined in comparison to last year. We believe this is due to improvements in data quality as well as an increase in waste production from one of our cable replacement projects. This year has seen a lot of material excavation in preparation for laying cables.

Figure 7. Construction waste destinations



What's next?

We will continue to work collaboratively with our supply chain to improve the accuracy of the data and work on a joint solution to improve recycling, reduce the waste we create and deliver improved resource efficiency in our construction schemes.

New construction recycling targets

Last year, we committed to define specific construction recycling targets once we improved our understanding of the data and benchmarked against other companies and industries. We have set our ET recycling construction target at 80 per cent. We have also created waste stream-specific targets as set out in table 5.

Table 5. New waste streams recycling targets

Waste stream	Recycling target
Concrete	100%
Wood	100%
Soils and stones	85%
Mixed construction & demolition wastes	95%

Please see pages 7–8 of our [Methodology Annex](#) to read more on our construction waste methodology.

Resource efficiency

We are continuing to prioritise resource use within our operations and our offices, increasing our recycling rates, reducing the amount of waste created, and reducing our water use.

We are doing this by influencing a change in employee behaviour, and across our supply chain and contractors.



43.4% office recycling rate



52.6% operational recycling rate



-35.3% in office water use

Office waste reduction and recycling

We achieved a recycling rate of 43.4 per cent at our offices and a waste reduction of 37.2 per cent compared to a FY20 baseline.

In FY23, we reviewed occupation levels at our offices. As a result, we have taken steps to optimise occupancy in our corporate offices leading to the closure of two offices. The office clearance process, although seeing high levels of redeployment and reuse, has resulted in increased volumes of office waste types unsuitable for recycling. This reduction in recycling is not representative of business as usual, and our performance for FY24 is expected to increase.

Operational recycling

Recycling generated from our operational sites saw an increase to 52.6 per cent compared to a FY20 baseline. This is a slight decrease from last year, as we have been working closely with our contractors and service providers to improve the quality and completeness of our data.

Water use

Water use in our offices saw a reduction in volume of 35.3 per cent from a FY20 baseline. Our water use increased from a 53 per cent reduction in FY22 due to higher office occupation levels. As our workforce returns to the office post-Covid on a more regular basis, we are taking measures to reduce our water use. We are taking measures to reduce our water use including the winter shut down of National Grid House cooling towers.



Case study

NGET Resource Marketplace

We will be relaunching our live resource marketplace in FY24 to encourage the reuse of any spare or surplus items and materials a site or project may have. This will help teams to reuse materials that may otherwise be wasted, encouraging an approach higher up the waste hierarchy. Items can be advertised through our internal social media channel and can include:

- Mechanical and electrical assets
- Overhead line (OHL) cables
- Materials (e.g. steel)
- Excavated materials (e.g. soils and stones)
- Personal protective equipment (PPE).

We are keen to have a positive impact within the communities we work and surplus items such as these may also be suitable for donation to local charities or third parties such as community groups and educational establishments.



Alignment to internationally recognised standards

Circular economy principles

Further adoption of the principles of circular economy contained within the BS:8001 standard will help us to ensure we are following best practice across the industry to deliver value to stakeholders and consumers.

In 2022 we did our first gap analysis to the standard. This determined that the business is currently at 'Level 1 – Basic'.

We need copper, steel, aluminium and many other raw materials to expand our grid. Adopting the principles of the circular economy will help us ensure we design a future network that is sustainable and resource efficient.

In FY24, we will be reviewing our gap analysis again and look for opportunities where circularity can be further embedded in our business.



Recycling with ReFactory

Resource use is a key focus within our business, and this is no different within our offices. To eliminate waste at its source and increase recycling where waste cannot be fully eliminated, we have mapped out all waste streams within our offices and identified those that can be removed. One of the waste streams identified is plastics.

We have been working with **ReFactory**, an environmental organisation dedicated to creating circular solutions for recycling waste.

ReFactory specialise in washing and shredding hard-to-recycle plastics into storm board which can then be moulded into products such as children's furniture.

In future projects, we will endeavour to purchase goods created from our recycled products for donation to local schools or charities. With our office closures this year, these services have been vital in avoiding as much waste to be sent to landfill as possible.



Alignment to ISO20400

Since 2017, we have been undertaking a bi-annual self-assessment against ISO20400 guidance for Sustainable Procurement to assess our approach to embedding sustainability into our procurement function. Our last gap analysis was carried out in 2021.

We have continually improved our performance, from enhancing procurement policies and strategies to embedding sustainability into the procurement process.

This includes but is not limited to developing a sustainability tool to assist our Category Managers and Leads when designing new frameworks. We have also strengthened our relationships with key vendors and partnered with organisations that support our ambitions to drive sustainable procurement across our value chain.

Maintaining our high standards of environmental management

Our aim is to maintain our high standards of oil containment and pollution management.

We are actively working to prevent pollution that may result from our activities and continually improve our environmental management system to protect the environment and reduce risks of environmental incidents.

FY23 performance

We regularly visit our operational sites to ensure that we continually maintain our high standards of oil containment and pollution management. In FY23, our Environment & Sustainability Team conducted a total of 59 site visits across the UK. These visits are an opportunity to share environmental good practices, provide an update on our performance against our EAP commitments and encourage engagement across ET to drive improvements on site.



59 environmental engagement visits conducted

Environmental incidents

We have an internal environmental incident classification which enables us to classify any environmental incidents from the least severe (near misses) to most significant (category 1). These are more stringent than external classifications. In FY23, 16 environmental incidents were reported compared with 14 in FY22 (excluding SF₆ top-ups)*. In FY23, we had four category 1 incidents, two were relating to fluid-filled cable oil releases, and the other two being SF₆ leaks. They are described in more detail in table 6. We understand the importance of investigating environmental incidents and near misses to ensure we can identify lessons learnt to prevent incidents occurring again in the future.

Certification of standalone ISO140001

During the year, we achieved certification of our environmental management system to ISO14001 for the Electricity Transmission business alone. In the spirit of continual improvement and to unlock efficiencies in our approach, we are developing an integrated management system that will combine this system with our ISO9001 quality management system and ISO45001 safety management system.

Table 6. Category 1 environmental incidents

Hover over for more information:

Incident type	Number of incidents	Incident description
Fluid-filled cable oil (FFC) releases	2	Fault on New Cross Wimbledon 275kV cable causing fall in cable pressure and loss of cable oil.
		Small leak on Bramley-Didcot cable causing loss of approximately 100l cable oil.
SF ₆ Leak	2	Bramford 400kV substation – estimated 111kg SF ₆ lost in cold weather conditions.
		New Cross substation – 146kg SF ₆ lost from circuit.



We are always looking for opportunities to improve our approach to environmental management, and working towards an integrated management system will allow us to optimise efficiency including integrated documentation and covering more locations during assurance activities.”

Lisa Baines, Environmental Technical Lead



*Last year, we reported incidents including near misses, please see our [Methodology Annex](#) to read more information on our environmental incidents.

Our oil leakage reduction strategy

Oil is used to insulate many of our electrical assets. At our substations, electricity voltage is stepped up or down through pieces of equipment called transformers.

They contain highly refined mineral oil used to insulate internal live parts of the transformer. However, this insulating oil can be lost from transformers for a number of reasons depending on age, design, load and temperature. If allowed to escape to the environment, transformer oil can be harmful to flora and fauna.



Reducing the risks associated with leakage from oil-filled cables

Older styles of electricity cables also contain oil to improve their insulation properties and to enhance cooling.

We are part of the Energy Networks Association (ENA) Fluid-Filled Cables Liaison Group which was established to provide a forum within the electricity networks sector to assist ENA Member Companies to meet their legal duties with respect to the management and environmental impact of fluid-filled cable assets.

Reducing the risks associated with leakage from oil-filled transformers

Bunds and interceptors are installed on all of our sites with oil-filled equipment to capture and contain any oil leaks. In the event of failure, penstock valves are used to isolate the flow of water to remain on site and stop a pollution release.

Berkswell 275kV substation has three Supergrid Transformers (SGTs) containing insulating oil. Last year, heavy rainfall caused a category 1 incident; transformer oil that had collected in the drainage system was flushed through a broken interceptor and damaged penstock valve into a small stream.

The findings from this incident helped to shape a new strategy, agreed with our Executive Committee, that will reduce the risks associated with leakage from oil-filled transformers.

It focuses on dealing with the challenges associated with managing ageing infrastructure that is more prone to leaks so we contain oil before it enters the environment. Using oil top-up information and records from site, together with an environmental risk assessment for each location, a new dashboard has been created to show where intervention can be planned and prioritised.

Case study

Berkswell – Our response

We are currently trialling the use of Automatic Closure Devices (ACDs) within the drainage system at Berkswell Substation to improve our pollution management and containment.

ACDs provide a quicker and more efficient solution to manually operated penstock valves to contain pollutants, preventing their release to the environment.

These are designed to operate automatically on detection of high oil levels to instantly shut off the surface water pathway. This will reduce the time taken to isolate the flow of water and ensure pollutants are contained on site.





Nature positive

Hover over for more information:



UK BUSINESS &
BIODIVERSITY FORUM

Our 2026 commitments

To enable effective monitoring of objectives and measures, the following RAG status definitions are used:

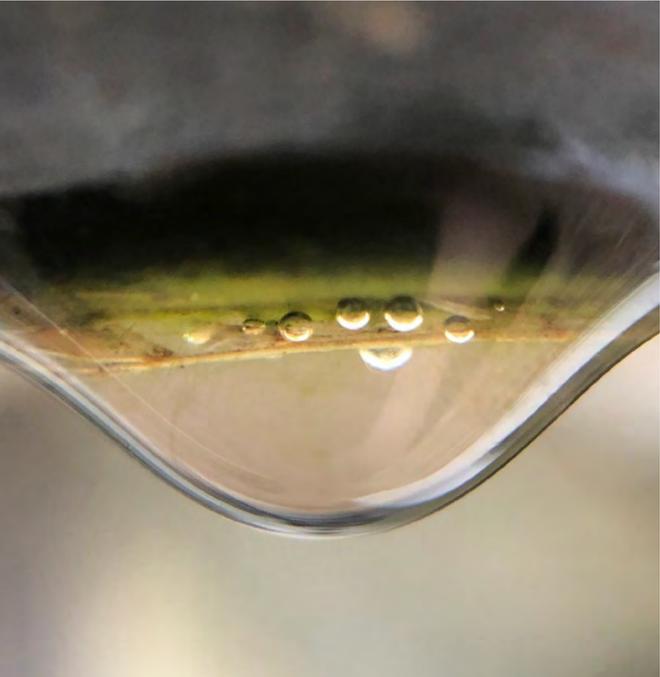
G

Progress against the implementation milestones is on track

A

Progress is delayed but it is likely to be achievable before the end of the regulatory period

Roll over the panels below to find out how we performed over FY22 and FY23.



Enhancing the environmental value of our non-operational land

We can continue to respond to the global biodiversity crisis by maintaining a proactive approach to the way we manage our land.

We have committed to improve the environmental value of our UK non-operational land by at least 10 per cent by 2026. Initiatives include:



Enhanced woodland

restoration and management, including tree/hedgerow planting and pond management.



Creation of a wild flower meadow

and delivery of beehives to increase pollination.



Environmental education

developing opportunities for young people to engage and connect with nature through volunteering events, family days, and forest school activities.

FY23 performance

We achieved a 3.2 per cent improvement in environmental value of non-operational land. This is an enhancement of 4.6 per cent over the last two years.

We have built on our approach from FY22 and focused on opportunities for connecting people to the natural environment and achieving habitat enhancement through strategic partnerships.

We have introduced 10-year partnership agreements at our Fleet substation site and two of our Environmental Education Centres that sit alongside substation sites at West Boldon and Skelton Grange.

These partnerships focus on restoring ancient woodlands through planting trees and hedgerows, as well as wildflower meadow creation to increase pollination.

These partnerships will enable at least 8,700 people per year from local communities to access nature via our sites throughout the duration of the 10-year agreements. This will allow us to provide opportunities for young people to engage and connect with nature through volunteering events, family days, and forest school activities.

Measuring environmental value

We have continued to use the 'natural capital' tool that we developed in 2015 to value ecosystem service change and track performance against our baseline and annual commitments. For more information, please see pages 11–12 of our [Methodology Annex](#).

In parallel, we have been working with a third party (**AIDash**) to improve our approach by supporting the development of an information system platform that utilises satellite data to quantify our natural assets, paired with updated Natural Capital valuation methodologies. We are currently undergoing testing and validation of this approach to enable us to transition to the new tool.

What's next?

We will continue to find new opportunities, in partnership with local environmental organisations, to make the best of our natural assets and efficiently manage them in ways that benefit local communities and nature.



Our work at Bishops Wood

Progress has been made at sites where partnerships were introduced in FY22.

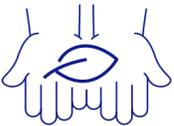
At Bishops Wood Environmental Education Centre, the **Field Studies Council** have coppiced two large sections of trees via volunteer groups and a Forest School Training programme.

Vegetation clearing has also been carried out to open out the pond surface area and make the dipping platforms accessible. Areas of younger woodland have been thinned to maintain the health of selected trees and the leftover wood has been used on site to make mallets, chopping blocks and insect areas.



Delivering environmental net gain

Environmental net gain, which incorporates biodiversity net gain (BNG), is a strategy to develop land and contribute to the recovery of nature, making sure the habitat for wildlife is in a better state than it was before development.



100% construction projects committed to deliver net gain of at least 10%



>15% net gain commitment in seven construction projects

How do we measure net gain?

Our approach to net gain starts with designing projects to avoid as much environmental harm as possible. After this, we calculate our impacts using the Department for Environment, Food and Rural Affairs (Defra) Biodiversity Metric calculator. This industry standard tool allows us to understand the impact and then design ecological mitigation and enhancement plans for each project.

For more information, please see pages 12–13 of our [Methodology Annex](#).

FY23 performance

Fourteen of our construction projects that were sanctioned had an impact on the natural environment and therefore were considered in-scope to deliver BNG. All these projects committed to achieving at least a 10 per cent improvement in BNG with seven committed to 15 per cent or greater.

Within this period, we have developed further training and guidance materials to support the business in delivering this commitment. We are also working closely with our ecological contractors and a wide range of external stakeholders to identify opportunities to deliver off-site gains that align with wider strategies and landscape scale initiatives.



Replenishing our carbon sinks

The environmental impacts of our work at Fiddler’s Ferry power station in Cheshire meant that we couldn’t deliver our net gain commitments on site, and so we partnered with **The Lancashire Wildlife Trust** to conserve and enhance a local wetland environment. Wetlands cover at least 6 per cent of the Earth and are a critical aspect of our conservation work due to the ecosystem services they provide.

This project is focused on increasing the water table to revert Highfield Moss back to its wetter state and encourage the growth of sphagnum mosses via a series of bunds and hydrology interventions within this Site of Specific Scientific Interest (SSSI).



It is these mosses that decay and compress to form peat, creating peatland ecosystems that are some of the most efficient natural carbon sinks on the planet. This conservation work will also encourage the movement of key species back to the site, such as the common lizard and bog bush crickets.



Our actions will deliver 26.8% BNG at Fiddler’s Ferry.



Delivering environmental net gain (continued)

What's next?

Business participation and the momentum for action was unprecedented at COP15 in 2022.

Target 15 of the Global Biodiversity Framework (GBF) requires businesses to identify, assess, monitor and transparently disclose impacts, dependencies and risks to biodiversity.

As such, we will continue to improve and review our approach to net gain each year, learning from previous projects and building on our successes.

We must ensure that appropriate management actions are built into long-term management plans, and we must monitor the impact of continued global environmental change on habitat and species resilience.

The GBF also highlighted the importance of introducing marine net gain solutions to reverse degradation resulting from increased development at sea to facilitate low-carbon energy generation (offshore wind). Marine net gain will be an important tool in helping us to achieve net zero and recover our oceans.

We will continue to work closely with stakeholders, partner organisations, and our delivery teams to ensure we achieve environmental net gain (including biodiversity) across all our construction projects for FY24, as well as identify opportunities and potential areas where we can achieve marine net gain.



Through our net gain commitments we have a great opportunity to make a valuable contribution to nature's recovery through partnership and targeted actions."

Chris Plester, Net Gain Technical Lead

Table 8. Non-operational sites enhanced with environmental value

Project name	Baseline units	Post intervention units	Total net unit change	Percentage net change
Biggleswade	44	127	83	189.6%
INDQ4 Grid Park Customer Connection	1	2	1	50.8%
Necton Vanguard 3 x 1320MW Vattenfall windfarms	1	2	1	20.0%
Demand Connection for UKPN at Little Horsted	107	124	17	16.3%
Amersham 100MVA Demand Connection Resanction	39	45	6	15.1%
Demand Connection for Sunderland City Council – Hylton Bridge 275/66V	62	72	10	15.0%
WISD2: Demand Connection for 120.5MW for Microsoft MCIO Ltd at Willesden and Kensal Green	5	6	1	15.0%
Various – Sundon	65	74	9	13.4%
Bramley – Melksham 400kV O/HL Uprating	50	55	5	10.0%
4VK COTT-EASO-WYMO OHL Refurb Year 2	15	17	2	10.0%
Melksham 132kV Substation PWS	*	*	*	*
ELST1: 208MVA Demand Connection Mod App	*	*	*	*
ZZA HATL2-WBOL2 Turn-In HAWP2	*	*	*	*
Reconductor remainder of A68B Coryton So	*	*	*	*

*We are awaiting habitat data and associated calculations for these schemes which have already committed to 10 per cent BNG.

Visual amenity

As the electricity transmission owner in England and Wales, we consider the visual amenity of our existing infrastructure in National Parks and Areas of Outstanding Natural Beauty (AONBs) through the 'Visual Impact Provision' (VIP) Project.

This project makes use of a £500m provision by Ofgem to carry out work that reduces the impact of existing transmission lines in English and Welsh Areas of Outstanding Natural Beauty (AONBs) and National Parks.

Progress made in FY23

Over the past year, we have continued to make good progress on the projects, building on work undertaken previously in FY22. This has been informed by technical and engineering design work as well as discussions with stakeholders, landowners, and local communities.

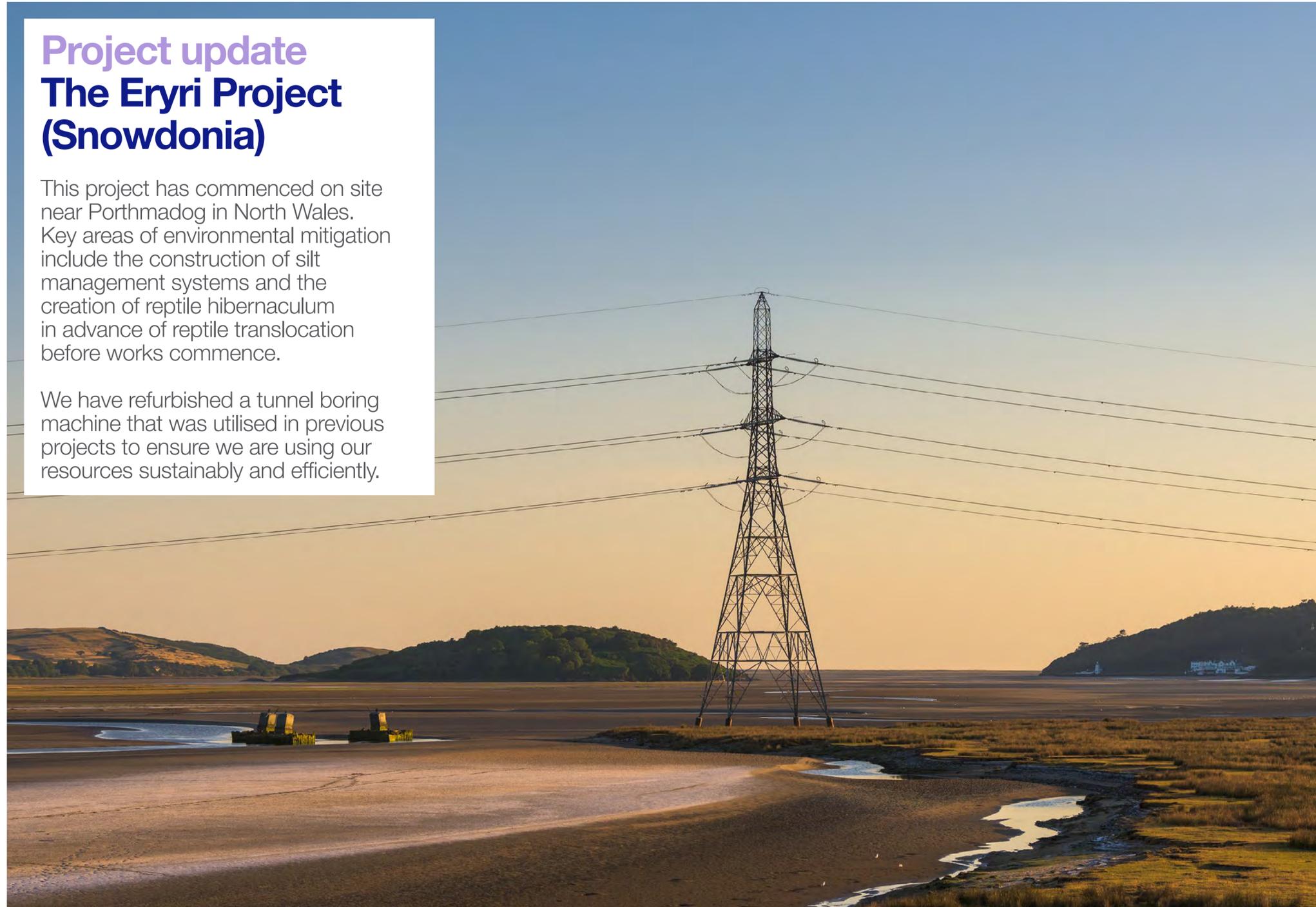


Hover over to see the Eryri Project progress

Project update The Eryri Project (Snowdonia)

This project has commenced on site near Porthmadog in North Wales. Key areas of environmental mitigation include the construction of silt management systems and the creation of reptile hibernaculum in advance of reptile translocation before works commence.

We have refurbished a tunnel boring machine that was utilised in previous projects to ensure we are using our resources sustainably and efficiently.



Visual amenity

Project update The Pentir – Dinorwig Project

Over the past 12 months the Pentir–Dinorwig circuit replacement project team have taken significant steps to reduce the environmental impact on natural habitats in North Wales. Environmental DNA (eDNA) testing has revealed sections of this site to be home to 7 internationally endangered fungi species. The site also provides a rich grazing pasture for sheep and has archaeological significance dating back to the 1200s.

To help mitigate the impact of climate change, while rebuilding biodiversity within local ecosystems, our team have built a strong working relationship with **Plantlife**, a local volunteer group. Collectively with **Plantlife** and our principal contractor, we have carried out our works sensitively to minimise our impact on this rare habitat, putting in additional controls and methods of working to restore any disturbance back to its natural state.

Project update Dorset AONB

We have successfully removed 8.25km of overhead line (OHL) including 22 pylons with underground cable. We have also restored native woodland and hedgerows by removing invasive non-native species.

Local stakeholders were consulted and updated from inception through to completion of this project and excellent feedback was received from numerous local events.

North West Downs AONB

Hover over to see our progress.

Project update The Peak East Project

We have successfully removed the last of seven towers and 1.5km of overhead line from skyline in Dunford Bridge in the Peak District National Park.

We are also planting 6,000 locally sourced, indigenous trees and hedge plants in the local area as part of our targeted biodiversity net gain activities. The team has successfully delivered a net gain of 18 per cent, and latest figures indicate that 99.96 per cent of construction-related waste has been diverted from landfill.



Hover over to see our the visual amenity data.



Leadership for change

Hover over for more information:



Our 2026 commitments

To enable effective monitoring of objectives and measures, the following RAG status definitions are used:

🔍 Roll over the panels below to find out how we performed over FY22 and FY23.

G

Progress against the implementation milestones is on track

A

Progress is delayed but it is likely to be achievable before the end of the regulatory period

Internal leadership and engagement

For us, leading the way means, firstly, having our senior leadership take accountability for our environmental performance.

It also means having a workforce that is engaged on environmental issues that lead by example.



Director remuneration linked to ESG



74% employee Engagement score on Responsible Business

Engaged workforce on environmental issues

Through our independently managed annual colleague listening process, Grid:voice, we asked our colleagues if they thought we behaved in a responsible way. The results of this survey showed that we have a 74 per cent engagement score on responsible business, an improvement from 72 per cent last year but below our target of 75 per cent.

Sustainability training

In FY23, we've launched an array of new training modules to help colleagues build on their knowledge of the global environmental crises and our role in delivering a sustainable future.

These training courses were developed to ensure we have a capable organisation, with the right knowledge and right skills to deliver net zero. This is the start of a revised suite of refreshed training modules to help to further embed sustainability into the way ET works.

Sustainability training modules/courses:



Delivering our environmental future.



Delivering net zero – carbon management.



Delivering our net gain commitments.



Waste management.



Substation oil loss.

Our climate champions

Our National Grid Champions network was set up last year to help grow understanding among colleagues of our role as a principal partner of the COP26 climate change summit. With the Glasgow summit having taken place, the network's focus this year has shifted to one linked to sustainability, our clean energy strategy and the wider climate change agenda.

The network:

- Educates, informs and raises awareness about climate change and the role we can all play in the fight against it.
- Amplifies, engages and builds understanding and pride around our sustainability commitments.
- Shares, uncovers and tells real stories of our sustainability journey coming to life across the business.
- Gets involved in activities, shares feedback and is a sounding board for our sustainability plans.
- Supports, enables and encourages involvement from colleagues with our sustainability plans.

Internal leadership and engagement (continued)

Case study
Linking executive pay to ESG goals

In July 2022, our Remuneration Committee conducted a review of the Directors' Remuneration Policy and made refinements to reflect the importance of our responsible business strategy and Environmental, Social and Governance (ESG) goals.

The committee considered and approved how ESG targets are incorporated in our long-term and short-term incentive arrangements and plans for Executive Directors and the Senior Leadership Group.

Performance is now linked to our strategic priorities, and our vision to be at the heart of a clean, fair and affordable energy future.



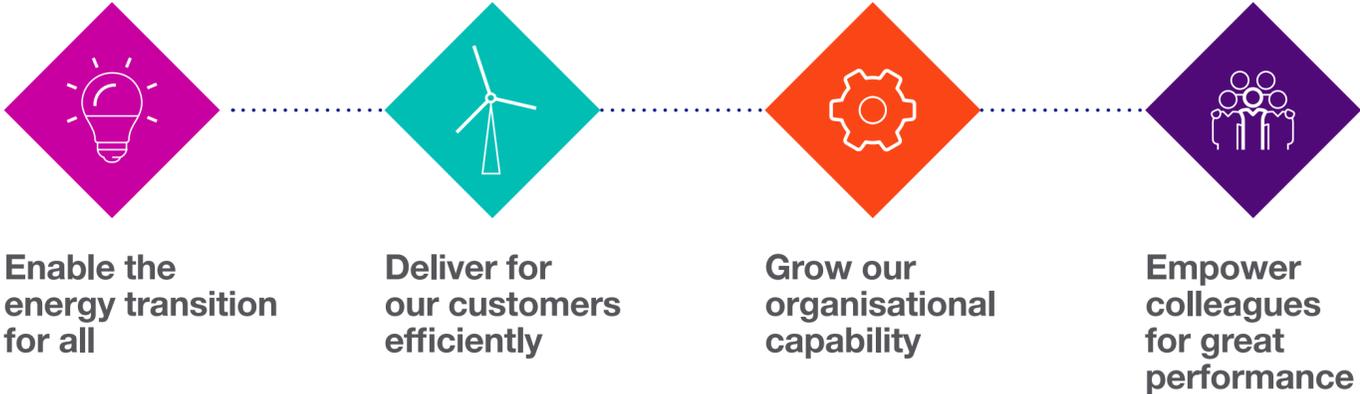
Our vision and values
Our vision is to be at the heart of a clean, fair and affordable energy future. Every day we do the right thing, find a better way and make it happen.



By embedding sustainability in our business strategy and using it as a lens to guide the way we do business, we are driving more efficient performance and future-proofing our organisation. Sustainability KPIs are now routinely acknowledged in our performance contract alongside traditional key performance indicators (KPIs)."

Alice Delahunty,
 President of Electricity Transmission

Our strategy



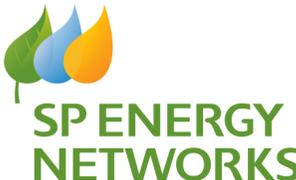
Working collaboratively with Transmission Owners

We have joint challenges and opportunities with the other Transmission Networks across all areas of sustainability.

We work closely with our colleagues in **Scottish & Southern Electricity Networks (SSEN)** and **Scottish Power Electricity Networks (SPEN)** to share best practice and learnings, helping to drive performance and further sustainability across the sector.



17 stakeholders targeted for Natural Capital Tool engagement, review and feedback



Transmission Owner Sustainability Forum

We have in-person workshops every four months to share best practice and identify areas in which to collaborate.

ROCCIT
Reduction of Capital Carbon in Transmission group looks at having a consistent approach to capital carbon accounting and driving performance.

Reporting Methodology
Helps drive consistency in how we report our impacts.

Waste & Resources
Works to set consistent waste reporting across and promote responsible resource use.

Natural Capital Working Group
Develops and implements a consistent sector-wide approach to natural capital assessment and valuation.

Sustainable Substation Innovation Group
Works in partnership with **Energy Industries Council (EIC)** to identify innovation opportunities for more sustainable substations.



Our new Natural Capital Tool – EcoUplift

We have continued to work in partnership with SSEN and SPEN to agree a consistent methodology for assessing Natural Capital Value and the provision of ecosystem services associated with our developments and land use change.

Following our pilot studies in FY22, we evaluated the results and outcomes against our requirements, building upon the **Natural Capital Laboratory (NCL)**;

a tool that requires very detailed ecological information to inform the Natural Capital outputs. Together with **AECOM**, we developed an approach that utilises the same valuation methodologies but can interact with other Natural Capital Tools and data such as publicly available data sources and location-specific information. Our tool is called EcoUplift.

Following creation of our new Natural Capital Tool, we launched a stakeholder consultation in December 2022 to help gather support and direct future development. The consultation was launched to a wide range of environmental stakeholders, including Natural England. Feedback was used to update the platform and address key aspects. Looking ahead,

we are committed as transmission owners to piloting the use of EcoUplift within our organisations across a range of construction projects, and we will continue to work with AECOM to improve the tool's functionality.



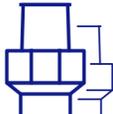
Taking bold steps to tackle our SF₆ emissions

Alternative technology to SF₆ is rapidly evolving, and every SF₆ alternative is at least 100 times better than SF₆.

We have led the way in Great Britain, collaborating with several manufacturers to find commercially viable alternatives with a lower global warming potential. As part of our new ambition, competing SF₆ technologies are now excluded from procurement activities when two or more technically and commercially viable solutions are available and offered.

~~SF₆~~

No procurement of SF₆ where commercial alternatives exists



Closure of Neaps End and Littlebrook substations has reduced our SF₆ usage

Sustainable and SF₆-free substations

We remain committed to reducing SF₆ emissions from our existing asset base through a combination of innovative leak repair, asset refurbishment and the use of SF₆-free replacement assets. We will refine our longer term plans for SF₆ inventory reduction to 2050 and work closely with our regulator to embed these plans in our

future price control periods. For new assets we will continue to progress towards being fully SF₆-free as swiftly as technology and full commercial availability allow. In particular, we will work with our suppliers to establish fully SF₆-free 420kV Gas Insulated Switchgear, including the construction of our Bengeworth Road and Harker projects. We will continue to deliver an innovation programme that supports both the management of existing SF₆ assets and the safe and reliable introduction of SF₆-free designs.



We're delighted that Bengeworth Road substation, at the heart of London Power Tunnels, will be SF₆-free. This project is part of National Grid's ambition to have no SF₆ in electrical assets by 2050."

Onur Aydemir, Project Director for London Power Tunnels

Case study

London Power Substation to be SF₆-free

To achieve net zero we have to reduce and remove this gas from our network. In FY22, we teamed up with **Hitachi** to successfully replace SF₆ in an existing asset at Richborough in Kent and this is the first time it will be used in a new build.

In FY23, we continued our partnership with Hitachi. To support the London Power Tunnels 2 (LPT2) project, we are building a new substation which will be free of sulphur hexafluoride (SF₆). The substation will be built to connect our LPT2 project to the distribution network in London. The seven-bay facility will be built at Bengeworth Road using Hitachi's EconiQ 420 kV gas-insulated switchgear and EconiQ 420 kV gas-insulated lines instead. EconiQ, cuts SF₆-related CO₂ equivalent emissions by 99 per cent.



Being an environmental leader

We are leading the way

In FY23, we contributed to a number of initiatives on environment and sustainability issues because we understand the urgent need to help shape our industry on the low-carbon transition. This included regional, national and worldwide collaboration.

Our memberships

We appreciate the importance of collaboration and partnerships for delivering our environmental sustainability agenda. That is why we are long-term members of a number of organisations:

- Business in the Community: BITC
- Contaminated Land Applications in Real Environment (CL:AIRE)
- Natural Capital Taskforce
- Net Zero Infrastructure Coalition
- Institute of Environmental Management and Assessment (IEMA)
- Infrastructure Client Group (ICG)
- The Major Infrastructure Resource Optimisation Group (Mi-Rog)
- Supply Chain Sustainability School
- Valuing Nature Network
- UK Business Biodiversity Forum
- Energy Networks Association
- Roundtable for Europe’s Energy Future.



Birmingham 2022 Commonwealth Games

National Grid was the Official EV Charger Provider for the Birmingham 2022 Commonwealth Games. We loaned 125 dual electric vehicle chargers for the Birmingham 2022 Commonwealth Games, supporting the ambition of making this event the most sustainable Commonwealth Games in history.



27th session of the Conference of the Parties of the UNFCCC

COP27 took place from 6 to 18 November 2023 in Sharm El Sheikh, Egypt. A small number of National Grid delegates attended the summit to participate in events and demonstrate our continued commitment to, and global leadership of, the clean energy transition globally.



Roundtable for Europe’s Energy Future (REEF)

Since the Ukraine war began, we’ve been looking at ways we can help through donations, advisory and other support. Over 40 per cent of Ukraine’s energy network has reportedly been targeted and destroyed by the Russian military. We are helping the Ukrainian energy industry to recover and decarbonise, through operation support, advice, training, sharing of knowledge and upfront engineering analysis.



Peak East VIP project

In FY23 **Sir David Attenborough** commended the good work of the Stakeholder Advisory Group in driving positive environmental benefits and practical conservation outcomes on the Peak East VIP project.

Our accreditations:

Looking
ahead

Our Annual
Environmental
Report
2023



Responding to a changing world

Changes to our EAP commitments

We are proud of the progress we have achieved in FY23. Looking ahead to next year, we have retired several of our commitments that we have already successfully achieved:

- Obtain ISO14001 Environmental Management System Standard for ET alone
- Have senior leadership accountability which reflects our corporate focus on the environment
- Work collaboratively with the other Transmission Owners to develop a consistent approach to capital carbon management.

We recognise that our success depends on understanding and responding to the changing world in which we operate. In December 2022, we carried out a second review of our EAP. We looked at feedback from internal/external stakeholders including our Independent User Group (IUG), the outcomes of COP27 – UN Climate Change Conference and COP15 – UN Biodiversity Conference, as well as our maturity and FY22 performance.

Following this review, we feel there is more we can do as a company to look at the impact we have on nature through our supply chain:

We will work collaboratively with the other transmission owners to agree a consistent approach to measure biodiversity impacts and dependencies in the supply chain (including water).

Looking ahead to FY24 and beyond

As we build the new electricity networks of the future, we have a huge responsibility to cut carbon emissions, innovate and set new standards for the infrastructure industry.

By pioneering new alternatives and collaborating with stakeholders, we are committed to delivering solutions that meet these demands and continue to raise the bar across our business and beyond. Particularly around SF₆ and construction carbon.

Based on our learnings and the changing external context, we also see an opportunity to evolve our environmental sustainability strategy and action plan towards 2031, and we will be engaging with a range of stakeholders to help us develop our thinking on our plans.

Performance tables

In FY23, NGET undertook an internal assurance process to provide limited assurance over selected data. More information can be found in our [Methodology Annex](#).



FY23 performance tables

To enable effective monitoring of objectives and measures, the following RAG status definitions are used:

- G Progress against the implementation milestones is on track
- A Progress is delayed but likely to be achievable before the end of the regulatory period
- R Progress against milestones is at significant risk and highly likely to be missed

Roll over the panels below to find out how we are doing

EAP commitment	Metric	Description and expected benefit	Implementation milestones					RAG	FY23 status update
			FY22	FY23	FY24	FY25	FY26		
Achieve 34% reduction in controllable scope 1 and 2 emissions from a FY19 baseline, with additional targets of: 50% reduction by 2030 and net zero by 2050.	% reduction in tCO ₂ e.	Reduction in scope 1 and 2 emissions (excluding losses) in line with a 1.5 trajectory.	-6.8%	-13.60%	-20.40%	-27.20%	-34%	G	-19% reduction in scope 1 and 2 emissions achieved. This was largely due to reductions in SF ₆ leakage.
Reduce SF ₆ emissions from our operations by 50% by 2030; from a FY19 baseline.	SF ₆ leakage (kg).	Reduction in SF ₆ leakage from our operations.	10,900kg	9,759kg	9,108kg	8,458kg	7,997kg	G	-20.5% reduction from baseline in SF ₆ leakage achieved (9,489.5kg).
Purchase 100% of electricity we use from renewables.	% of renewable energy supplied.	No greenhouse gas emissions from fossil fuels.	Prepare for the Power Purchase Agreement (PPA) to be in place.	Power Purchase Agreement (PPA) in place.	100% of renewable energy supplied.			A	Tender still in development, Power Purchase Agreement on track for FY24.
Create a substation energy-efficiency programme.	Programme with annual milestones established.	Achievement of optimal carbon savings and return on investment.	Set up programme strategy.	Obtain Energy Performance Certificates for 30 nominated sites and utilise the recommendations to provide a plan.	TBC	TBC	TBC	G	Energy Performance Certificates obtained for 30 sites.
Focus on an efficiency-first approach to decrease the carbon emissions from our office energy use by 20% from a FY20 baseline.	% reduction in CO ₂ from energy use.	Reduction in carbon emissions from energy use in our offices.	-4%	-8%	-12%	-16%	-20%	G	-22.7% reduction in carbon from energy use achieved.
Replace 60% of our fleet with Zero Emission Vehicles (ZEVs).	% of vehicles replaced with ZEVs.	Reduction in carbon emissions from operational travel.	+10%	+19%	+27%	+43%	+60%	A	11% or 97 fleet vehicles replaced with zero emission vehicles (ZEVs).
Reduce carbon emissions for our business transport by 10% on 2013-2020 averages.	% reduction in tCO ₂ e.	Reduction in carbon emissions from business travel.	-2%	-4%	-6%	-8%	-10%	G	-21.5% in carbon emissions from business travel.
Create a transmission losses strategy.	Strategy established and annually reviewed.	Reduction in carbon emissions from transmission losses that are in our control.	Create transmission losses strategy.	Create transmission losses strategy as not delivered in FY22.	Review and update strategy.			G	Transmission losses strategy updated and signed off at executive level.
Deliver carbon neutral construction.	Carbon neutral construction is achieved by emissions reductions and offsetting.	Reduction in capital carbon from construction projects.	10% year-on-year reduction.	10% year-on-year reduction.	Internal gap analysis against PAS2080 standard.	Implement recommendations from gap analysis.	Carbon neutral construction.	A	153 tCO ₂ e/£m was our capital carbon intensity.
75% of National Grid's top 250 suppliers engaged through CDP (by category/spend) will have carbon reduction targets.	% of suppliers with carbon reduction targets.	Reduction in carbon emissions from our supply chain.	+70%	+72%	+73%	+74%	+75%	G	73% of UK allocated suppliers (within the top 250 by category/spend) have carbon reduction targets.
Install 1,430 ac EV charging bays and 40 dc EV chargers on ET operational state in support of the commercial fleet electrification programme.	Number of ET sites with EV chargers.	Reduction in carbon emissions from operational travel.	35	70	70	70	Target achieved.	G	447 EV chargers installed at 79 ET sites.
All Band A-C company cars to be zero emission vehicles (ZEVs).	% of Band A-C company cars that are ZEVs.	Reduction in carbon emissions from operational travel.	35%	58%	73%	93%	100%	G	71% of Band A-C manager company cars are ZEVs.
Phase out the use of diesel generators where commercially and technically viable.	% reduction in diesel use.	Reduction in carbon emissions from diesel generators.	N/A	Alternative fuels to diesel trials.	Diesel free sites trials and diesel usage data collection.	Update internal policy to remove the use of diesel when there is a commercial alternative.		A	Trials commenced for zero-emission alternatives.

Charts and graphs

Roll over the panels below to find out how we are doing



Net zero carbon emissions headlines		FY22	FY23
Annual change in Insulation and Interruption Gas emissions (%)		13.8	2.9
Low-carbon and renewable energy capacity connected to the network (MW)		1,869	0
Investment into innovation activities primarily supporting decarbonisation and/or protecting the environment (£)		0.4	6.6

Scope 1 & 2 emissions		FY22	FY23
Scope 1 – Fugitive emissions	IIGs (tCO ₂ e)	229,777	223,003
Scope 1 – Operational transport	Direct commercial vehicles (tCO ₂ e)	5,255	5,155
Scope 2 – Building energy use	Buildings – office depots electricity (tCO ₂ e)	308	242
	Buildings – other fuels (tCO ₂ e)	1,849	1,505
	Substation electricity (tCO ₂ e)	12,984	11,817
Scope 2 – Electricity losses (tCO ₂ e)		1,152,795	1,299,340
Total including losses (tCO₂e)		1,402,968	1,541,062
Total excluding losses (tCO₂e)		250,173	241,723

IIG type	FY22	FY23
Total IIG emissions (tCO ₂ e)	229,777	223,003
SF ₆ emissions (tCO ₂ e)	227,312	217,992
SF ₆ /N ₂ (tCO ₂ e)	2,468	5,020
Leakage rate (%)	1.06	1.01
Interventions per annum (number)	29	44
Estimated impact of interventions (tCO ₂ e avoided or abated)	9,995.5	3,608.9

Transmission losses	FY22	FY23
Annual losses (TWh)	5.42926	6.7191
Share of total electricity (%)	2.08	2.51
CO ₂ emissions (tCO ₂)	1,152,795	1,229,340

Capital carbon	FY22	FY23
Capital carbon intensity (tCO ₂ /£m)	163	153

Supply chain	FY22	FY23
Percentage of suppliers meeting our supplier code (%)	74	73
Percentage of suppliers that have their own sustainability metrics or KPIs (%)	74	73

Let us know what you think

The future of energy affects all of us. So, we would like to hear from you – our communities, customers, employees, investors and suppliers.

Our **Environmental Action Plan** is a collaborative programme, so we need your feedback to make sure we continue to focus on the right areas and deliver the results that matter the most.

We share updates, our successes and insights along the way on our [website](#).

If you would like to contact us about any aspect of our Annual Environmental Report, please email: .box.ET.Environmental@nationalgrid.com

For more information on our approach to responsible business, click [here](#).

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Click the link to download a pdf of this [Environment Report](#).

