

Electricity
Transmission

Our Annual Environmental Report

September 2022

nationalgrid

About this report

This is our first Annual Environmental Report within the context of our regulatory framework for 2021-2026, RIIO-T2.

Our report provides a progress update on how we are achieving our environmental commitments as set out in our Environmental Action Plan.

The scope of this report is focused on performance data for the financial year reporting period from 1st April 2021 to 31 March 2022. The report focuses solely on National Grid Electricity Transmission's (NGET's) activities.

This report is supported by a Methodology Annex document which describes the scope and boundaries

of our environmental commitments, along with the assumptions made around our calculation and measurement methods.

We have engaged ERM CVS to provide limited assurance over selected information. Their assurance statement is available on our website and on page 48 of this document.

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

**Our Annual
Environmental
Report**
2022

Introduction

Net zero carbon
emissions

Sustainable use
of resources

Nature positive

Leadership
for change

Looking ahead

Performance
tables

Contact us



Our business

We are National Grid Electricity Transmission plc (NGET)

We own and maintain the high-voltage electricity transmission network in England and Wales. That includes c.4,500 miles of overhead line, about 900 miles of underground cable and more than 300 substations.

What we do

Serving England and Wales, we move electricity from where it is generated to where it is needed. We are responsible for transporting the electricity generated from wind farms 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.



**c.4,500
miles**
of overhead
line.



**900
miles**
of underground
cable.



**Over
300**
substations.

Introduction

Net zero carbon
emissions

Sustainable use
of resources

Nature positive

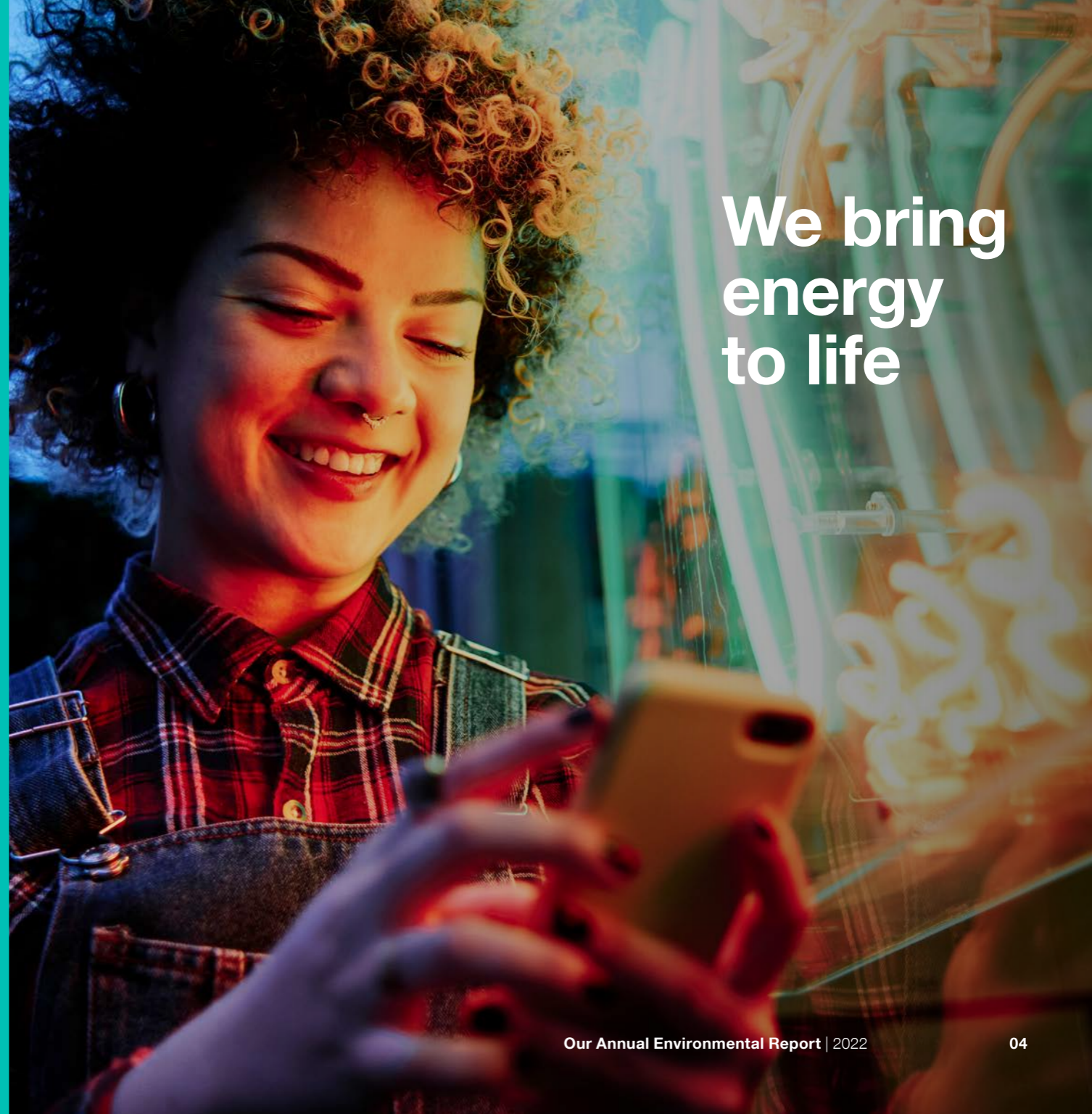
Leadership
for change

Looking ahead

Performance
tables

Contact us

We bring
energy
to life



Introduction

Net zero carbon
emissions

Sustainable use
of resources

Nature positive

Leadership
for change

Looking ahead

Performance
tables

Contact us

Welcome to our 2021/2022 Annual Environmental Report



It is critical that we continue to lead the way to achieve faster progress and meaningful change on our transition to a net zero carbon future.”



Our electricity network is transitioning to a cleaner, greener future.

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us



I am delighted to welcome you to our first Annual Environmental Report of RIIO-T2 for 2021/22. We have taken positive steps towards our net zero future during this year and achieved strong progress against our environmental commitments.

Our net zero targets have been validated by the Science Based Targets Institute in line with limiting greenhouse gas emissions to a 1.5°C warming scenario. We have made some great strides in our decarbonisation journey, achieving a 16.4 per cent reduction in our scope 1 and 2 emissions and delivering a 15.7 per cent reduction in SF₆ from a 2018/19 baseline.

The impacts of Covid-19 show that businesses need to be agile and flexible and we have seen our people adopt hybrid ways of working as they return to our offices. This has helped to reduce energy usage and business transport, leaving a positive legacy on our transition to a clean energy future.

In 2021, we were also reminded of how vulnerable our natural environment is to climate change. As a major landowner in the UK, we are in a unique position to create healthy ecosystems and support biodiversity across our landholding. We have delivered 1.4 per cent improvement in environmental value across our non-operational land.

I am pleased with the progress we are making towards enhancing the natural environment, where 100 per cent of our construction projects in scope have made commitments and developed plans that will deliver at least 10 per cent net gain, with some even exceeding that 10 per cent mark.

We are also showing leadership externally. It was an honour for National Grid to be a COP26 Principal Partner in November 2021. Our message following COP26 is clear – it is critical that we continue to lead the way to achieve faster progress and meaningful change on our transition to a net zero carbon future.

As we look ahead to next year, we will continue to collaborate with our partners and supply chain to find innovative solutions to lead the energy industry forward. We have some tough challenges ahead with the gas shortages and increased cost of energy caused by the current unrest in Eastern Europe. It is our role as a responsible business to ensure that the journey to reach net zero is fair, equitable and sustainable for all.

Alice Delahunty

Alice Delahunty
President, Electricity Transmission

Our environmental vision

The actions we take in the next decade will be critical to limiting the impact of global warming and biodiversity loss. Both impacts are related, they are two sides of the same coin, and a direct result of human activity on the planet.

We recognise that 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. This report focuses on the progress we have made in 2021/22 across our four environmental priority areas:



Net zero carbon emissions

We are reducing our direct emissions in line with science based targets and will deliver carbon neutral construction.



Sustainable use of resources

We are finding ways to achieve zero waste to landfill and using circular economy principles to make the most out of natural resources and our assets.



Nature positive

We are valuing nature. We are protecting and enhancing it, where possible, using natural capital and net gain principles.



Leadership for change

We are being leaders in our industry to advance environmental good practice.

FY22 performance at a glance

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

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us



Environmental Management System certified to ISO 14001



34% reduction by 2026

in scope 1 and 2 emissions targets verified by the Science Based Target Institute (SBTi).



10%

of vehicles in our light duty commercial fleet replaced with zero emissions vehicles.



-16.4%

in scope 1 and 2 emissions against 2018/19 baseline.



-15.7%

in emissions from SF₆ from a 2018/19 baseline.



**Our Annual
Environmental
Report
2022**

Introduction

**Net zero carbon
emissions**

Sustainable use
of resources

Nature positive

Leadership
for change

Looking ahead

Performance
tables

Contact us





Net zero carbon emissions



Overview

Helping society to decarbonise is the biggest contribution we can make to the environment. This means facilitating the connection of low-carbon and renewable energy sources across the UK.

However, our own carbon footprint is also significant. We must consider our direct impact, from the harmful emissions we emit ourselves to the indirect impact of our supply chain emissions.



External context

Climate change is the defining challenge of the 21st century. The science is clear – we must act now to limit global warming to 1.5 degrees and avoid the worst effects of climate change on people and the planet.

Our 2026 commitments

Roll over the panels to find out how we performed in FY22

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

Our contribution to a decarbonised energy system

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

We have a dual role to play in delivering direct environmental value through our day-to-day activities, and supporting wider societal aims, particularly decarbonisation.

While continuing to manage our environmental performance responsibly, we have emphasised the need to facilitate the transition to a clean energy system.



FY22 connections performance

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

In 2021/22, we connected 1,869MW of low-carbon and renewable energy, following additional offshore wind capacity at Triton Knoll (540MW), Hornsea 2 (1,320MW) and Lincs Offshore Wind Farm (9MW). Overall, 20.9GW of low-carbon generation is supported by our network.



20.9 GW

of low-carbon generation is supported by our network.



1,869 MW

low-carbon and renewable energy capacity connected.



36.9%

of the generation connected to our network is low carbon.



74 days

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



294

connection offers made.



7.8

was our quality of connections score.

Our climate commitment

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

To avert the worst effects of climate change, the world needs to transition to net zero by 2050*. We have committed to achieve net zero by 2050, with interim targets of:

34% reduction by 2026, and

50% reduction by 2030.

These targets are from a 2018/19 baseline and they exclude emissions from transmission losses.

FY22 GHG performance

In 2021/22, our scope 1 and 2 greenhouse gas (GHG) emissions were 249,921 tCO₂e, a 16.4 per cent decrease against our 2018/19 baseline. We achieved reductions in all aspects of our carbon footprint.

This year, our emissions reduction targets were validated by the Science Based Target Initiative (SBTi), in line with limiting global temperature rise to 1.5°C above pre-industrial levels.



-34%

scope 1 and 2 emissions target was validated by the SBTi.



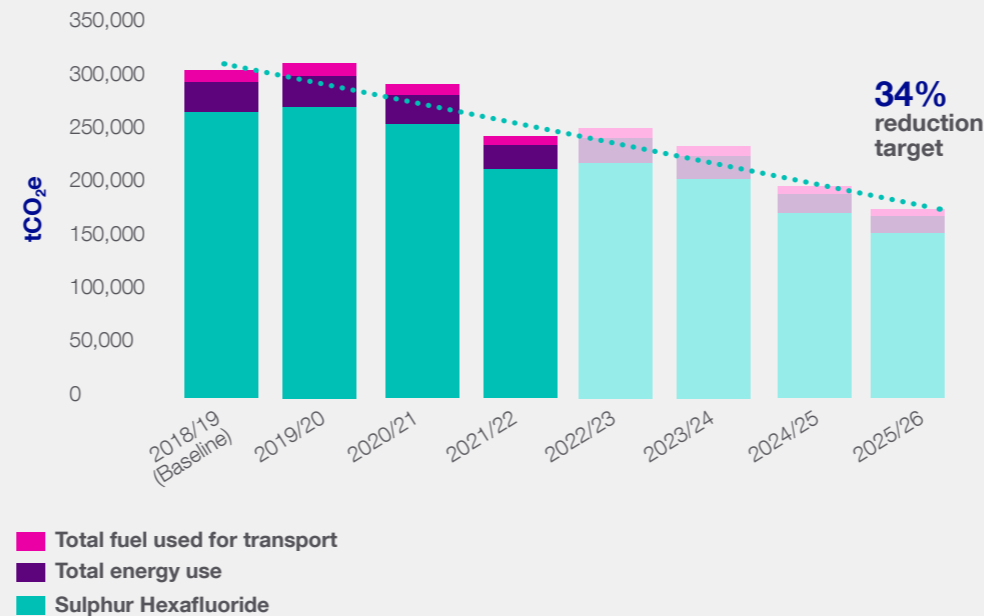
-16.4%

in business carbon footprint against 2018/19 baseline.

What are science-based targets?

A science-based target is a target for greenhouse gas emissions reductions that is based on the level of reduction that science says is required to prevent the effects of climate change. Basing these targets on 1.5°C climate change scenarios means that they are based on the Paris Agreement's most ambitious goal.

Figure 1. ET's business carbon footprint (excluding electricity losses)



*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.

“National Grid’s unique role means it’s important that our contribution to net zero is credible and transparent.”

Paul de Jong, Environment & Sustainability Manager

Understanding our scope 1 and 2 GHG emissions

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

Most of our emissions are the result of electricity transmission losses from our network. These occur because of electricity lost through heat when transmitting power. Emissions from these losses fall as the carbon of electricity falls, and this is largely out of our control.

Our carbon reduction strategy is focused on the emissions we can control. Our scope 1 emissions relate to fugitive emissions and leakage of sulphur hexafluoride (SF₆) used as an insulating gas in high-voltage equipment (approx. 92 per cent of our emissions) and the fuel we use for business transport (approx. 2 per cent of our emissions).

Our scope 2 emissions relate to the energy used in our buildings (approx. 6 per cent of our emissions) and transmissions losses, which we report but don't account for in our target. Our transition to net zero is heavily reliant on our SF₆ strategy and performance.

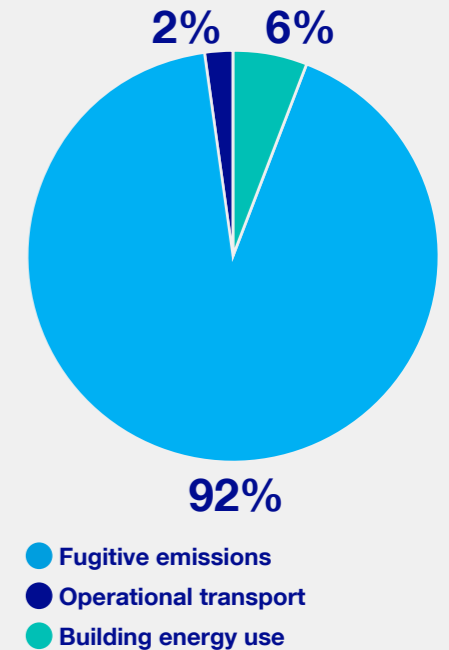
Emissions from electricity transmission losses

In FY22, emissions from electricity losses were down by 8.2 per cent from last year. This is the result of a reduction in grid electricity carbon intensity. We are committed to creating a transmission losses strategy to focus our efforts in the areas where we do have control, such as how we factor losses into our investment decisions. The strategy will commence and be completed in FY23.

Table 1. Scope 1 and 2 emissions

Table 2. Transmission losses

Figure 2. NGET's scope 1 and 2 emissions (excluding losses)



IIG emissions – SF₆ leakages

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

For decades, SF₆ has been used within high-voltage electricity equipment due to its excellent electrical insulating and current interrupting properties. SF₆ is a potent greenhouse gas with Global Warming Potential (GWP) of 23,500 times that of carbon dioxide (CO₂) and although equipment containing it 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. We are committed to reducing emissions of SF₆ using a combination of leak prevention, leak repair, asset refurbishment, retro-fill (deploying alternative gases to SF₆ within existing equipment) and asset replacement.

FY22 performance

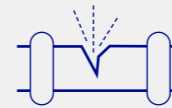
In 2021/22, our Insulation and Interruption Gas (IIG) emissions were 229,525tCO₂e. Total emissions are made up of two parts, firstly the pure SF₆ emissions (9,703kg) and secondly the SF₆ content of SF₆/N₂ emissions (175kg). This year we achieved a 15.7 per cent decrease from a 2018/19 baseline. Improved performance was the result of a new focused SF₆ team that was formed to deliver SF₆ intervention development and delivery. Interventions across 29 SF₆ leaking gas zones were delivered in FY22, avoiding approximately 10,000tCO₂e.

In January 2022, we put forward a submission to our regulator to obtain further funding for SF₆ intervention. We are pleased that Ofgem have considered there is sufficient evidence to justify further funding to reduce approximately

500,000tCO₂e needed to meet our net zero targets. Alternatives to SF₆ are starting to be used on the high voltage (HV) network and usage of these will significantly increase over the RII0-T2 period. A range of solutions now exist for our 132KV network but a full portfolio of 400KV options is still in development, and we work closely with suppliers to accelerate development. For more information on the bold steps we are taking on SF₆, please see pages 37–38 of the report.



-15.7%
reduction in emissions from SF₆ from a 2018/19 baseline.



1.06%
is our SF₆ leakage rate.

Table 3. IIG emissions



We have set ourselves ambitious targets to reduce our dependency on SF₆ technology and to reduce the impact of any leaks to the atmosphere.”

Mark Waldron,
Net Zero Asset Strategy
Technical Leader

Energy usage

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

Energy use in our buildings accounts for around six per cent of our greenhouse gas emissions.

We own and maintain more than 300 substations across England and Wales. As part of our ambition to achieve net zero carbon emissions, we are committed to reduce our carbon emissions through improving energy efficiency across our operational substations. 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 19.3 per cent from a 2019/20 baseline. Lower occupancy in our buildings and hybrid ways of working following Covid-19 have positively supported emissions reductions. Although increased ventilation requirements due to Covid-19 have limited opportunities for conservation measures, control improvements and technology have delivered performance improvements this year.

Substation energy efficiency programme

In FY22, an Energy Efficiency Working Group was established. The working group produced a programme of works that identified a sample of trial sites across National Grid’s estate of high-voltage electricity substations for energy efficiency surveys.

We have targeted 50 substation surveys to be held between October 2022 and March 2023. The surveys will explore energy use across the entire site including operational usage, site lighting, and domestic use in site accommodation. The recommendations of each survey will guide us in planning the optimal carbon saving and return on investment at each site.

Purchasing 100% renewable energy

With the UK aiming to reach net zero by 2050, a crucial part of the strategy is to transition to an electricity system with 100 per cent zero-carbon generation. Much of this is expected to come from renewable energy. We are on track to achieve our target of purchasing 100 per cent renewable energy by 2023. We will achieve this by putting a Power Purchase Agreement in place next year.



-19.3%
reduction in carbon emissions from our office energy use from a 2019/20 baseline.



Substation energy efficiency
programme strategy established.



Operational and business travel

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

Transport makes up 23 per cent of energy-related carbon emissions globally. Businesses have a critical role to play in leading by example and encouraging an uptake of electric vehicles within their own fleets.

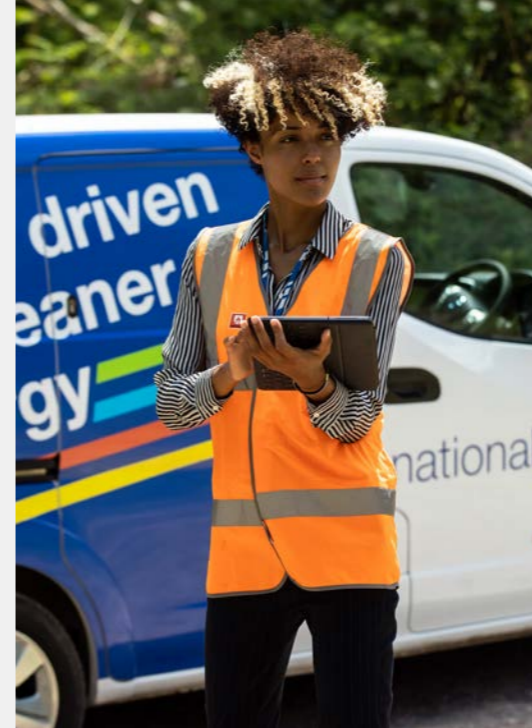
Although it only accounts for approximately 2 per cent of our business carbon footprint, we feel it is critical to lead the way in the shift to zero emissions vehicles.

Putting the brakes on our fleet's carbon emissions

In line with our commitment to replace 60 per cent of our commercial fleet by 2026, 83 (10 per cent) of our light duty fleet vehicles were replaced in FY22 by zero emission vehicles (ZEVs).

Reducing emissions from business travel

In 2021/22, emissions from business travel saw a reduction of 39.8 per cent on 2013-2020 averages. Travel has reduced over the last couple of years due to Covid-19 restrictions and the introduction of more hybrid ways of working. We will continue to encourage the use of technology, as well as more sustainable ways of travelling, such as taking public transport or car sharing when travelling to meetings, to maintain emissions reduction from business travel.



The EV100 initiative

In June 2021, we joined the EV100 initiative, a global initiative launched by the Climate Group that brings together companies committed to the transition to electric vehicles. The initiative provides an opportunity for global leaders to share ideas, demonstrate the growing case for going electric, and engage with governments and stakeholders on how we can collaboratively remove remaining barriers.



-39.8%
reduction in carbon emissions from business travel on 2013-2020 averages.



0.197 kgCO₂/mile
was our CO₂e intensity of an operational mile.



87 of 836
vehicles on our light duty fleet are zero emissions vehicles.

Our scope 3 emissions

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

There are a number of benefits associated with measuring scope 3 emissions. For many companies, the majority of their greenhouse gas (GHG) emissions and cost reduction opportunities lie outside their own operations.

In FY22, we worked with the Carbon Trust to complete a screening exercise and identify the most relevant scope 3 emissions of our network. We used the financial year of FY21 to complete the assessment.

The scope 3 emissions relevant to our network included all the upstream categories, with the exception of category 8 Upstream Leased Assets, and none of the downstream categories. The results of this screening exercise are presented in Table 4.

Our scope 3 emissions in FY21 were 462,221 tCO₂e, making up 23 per cent of our total value chain emissions (including losses). Capital goods (42 per cent), fuel and energy-related activities (38 per cent) and purchased goods and services (18 per cent) make up 98 per cent of our scope 3 emissions.

The results of this screening exercise confirm the significance of our approach to reducing capital carbon from our construction projects. We will also work closely with our supply chain to reduce the carbon impact from the products and services that we buy.

We already have targets in place in those two categories.

We will be reporting our scope 3 emissions for the relevant categories from FY23. Financial spend data was primarily used for the screening exercise. To improve accuracy, we will aim to replace spend-based emissions calculations with volumetric data where we can.

Figure 3. Upstream and downstream scope 3 emissions

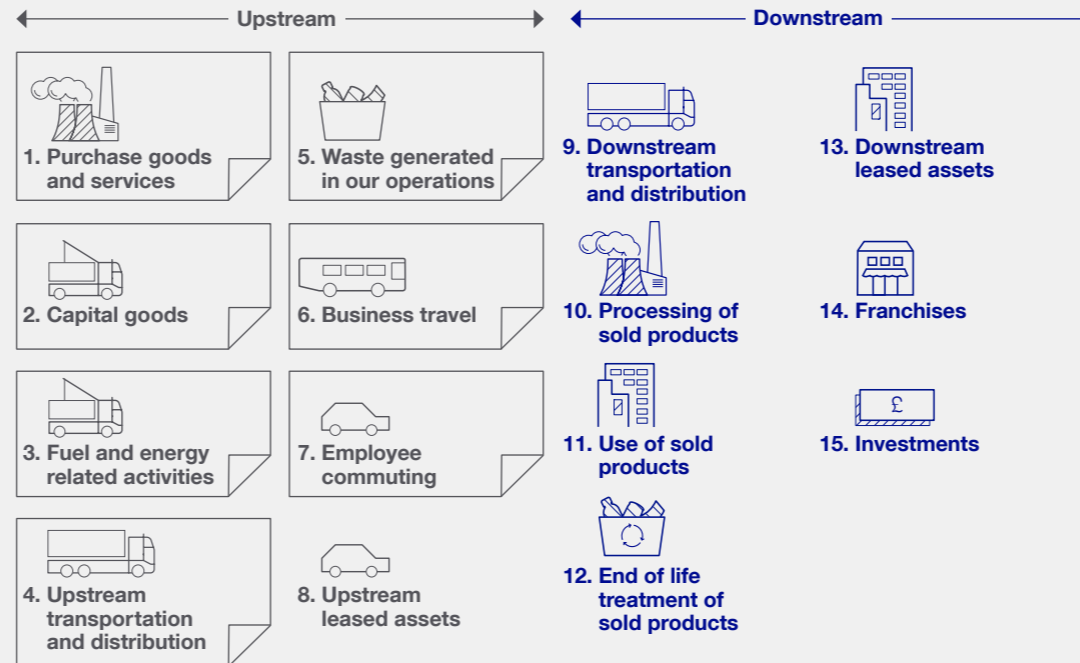


Table 4. FY21 ET scope 3 emissions

	Category	Total emissions (tCO ₂ e)	% of scope 3	scope 3 materiality
Upstream categories	1 Purchase goods and services	82,004	17.7	High
	2 Capital goods	195,076	42.2	High
	3 Fuel and energy related activities	177,324	38.3	High
	4 Upstream transportation and distribution	1,827	0.4	Low
	5 Waste generated in our operations	3,830	0.8	Low
	6 Business travel	73	0.0	Low
	7 Employee commuting	2,088	0.5	Low
	Total scope 3 emissions (tCO₂e)	462,221	100	

RAG status

High materiality (Green)
Low materiality (Orange)



Carbon neutral construction

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

Construction plays a huge part in what we do. The infrastructure we provide and services that we deliver to support a lower carbon future are critical to the delivery of national and regional climate change targets. To reduce our environmental impact and encourage low-carbon and renewable energy sources, we are committed to deliver carbon neutral construction by 2025/26.

Whilst net zero national infrastructure cannot guarantee a net zero economy, inaction will guarantee that aspirations for a net zero economy will not be achieved.

FY22 progress

In RIIO-T1, we focused our efforts on embedding carbon into our decision-making. This approach helped us achieve a 34 per cent reduction in carbon intensity at design from a 2015/16 baseline. In the first year of RIIO-T2, we have focused our efforts in reviewing our processes and carbon tools, particularly at the delivery phase of construction to help achieve further reductions in the future. We concentrated on five priorities:

Roll over the following priorities to discover more



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



+4.5% is the carbon intensity of our construction projects from FY21.

What is the Carbon Interface Tool (CIT)?

The CIT is our Excel-based, in-house tool that allows us to understand and quantify the capital carbon of projects at development and in delivery in detail.

Capital carbon performance

We report on our capital carbon performance for construction projects that have started in April 2021 and have completed in the reporting year. In 2021/2022 our carbon intensity measure was **163tCO₂/£m**. This is a 4.5 per cent increase from last year's 156tCO₂e/£m performance.

Carbon intensity performance is heavily impacted by the type of projects in our workbook. During this first year of RIIO-T2, we only had six construction projects that started and completed within the timeframe. This is a very low sample from which to report an average carbon intensity. There is a low degree of confidence in the overall intensity and we are likely to see the number change as more projects are completed. The types of projects in the first year were mainly substation equipment replacements, including LVAC supplies upgrades, alongside one flood protection scheme. Please see pages 4–5 of the [annex](#) for more information on our capital carbon methodology.

What's next?

We will increase carbon capability within our delivery units, by offering a dedicated carbon training module and further guidance on how to account for carbon from development to delivery. We will be engaging more with our contractors on carbon performance as we are heavily reliant on them to deliver carbon emissions reductions. We will also be updating our Carbon Interface Tool and other reporting tools in line with best practice.

Carbon neutral construction (continued)

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

How are we going to deliver carbon neutrality in the long term?

We will achieve carbon neutrality by reducing emissions as much as we can using the principles of PAS2080 (Carbon Management in Infrastructure). However, due to the high carbon intensity of some of the materials, we will need to offset residual emissions in 2025/26.

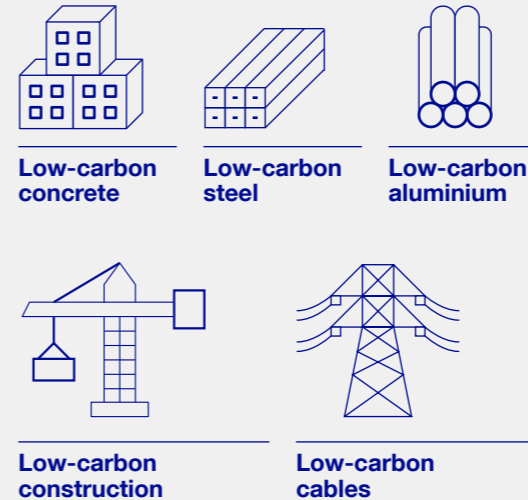
There are many offsetting options available, of varying quality, and it is important National Grid invests in projects that align to its values as a responsible business. Offset credits need to ensure they are permanent, verifiable, enforceable and real, and that they deliver co-benefits such as ecosystem enhancement. We will also prioritise a partnership approach or invest in local or regional projects. We will offset in accordance to PAS2060 – the internationally recognised specification for carbon neutrality.

Suppliers with carbon reduction targets

Environmental sustainability is a collective responsibility and our supply chain is critical to help us turn our visions for a sustainable future into reality. That is why we made a commitment for 75 per cent of our top 250 suppliers (by category/spend) to have carbon reduction targets by 2026.

In FY22, 74 per cent of UK allocated suppliers (within top 250 by category/spend) engaged through CDP have carbon reduction targets. To support our commitment to net zero by 2050, we are promoting the adoption of Science Based Targets by suppliers that have a significant contribution to our scope 3 emissions. We understand our supply chain is in different stages on their journey to net zero and we help by suggesting areas for them to focus on in order to reduce their own emissions.

Figure 4. National Grid's low-carbon working groups



edie

Case study: EDIE Sustainability Finalist

In FY22 we were shortlisted for the EDIE Net Zero Carbon Strategy of the Year Award for our Littlebrook 400kV Substation project. The application of the carbon hierarchy principles of PAS2080 – 'Build Nothing', 'Build Less', 'Build Clever' and 'Build Efficiently' was demonstrated, resulting in a 72 per cent carbon reduction, and equating to a £6 million cost saving.



Our low-carbon working groups are helping us develop a roadmap to deliver on our commitment to deliver carbon neutral construction by 2026 and beyond.”

Zac Richardson,
Director of New Infrastructure

Climate change resilience and innovation

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

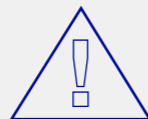
We are aware of the impact that climate change will have, and is having, on our network. In order to deliver the continuous service our customers expect, we are ensuring that our business is designed to cope with disruptive events, especially those associated with increasingly common severe weather conditions.

Our commitment to net zero continues to shape our innovation strategy, with our key aim being to deliver cleaner and cheaper energy. We can't decarbonise our electricity network without investing in new technologies.

Climate change resilience and adaptation

In FY22, we significantly increased the robustness of our climate adaptation assessment to ensure our assets are designed to cope with the most severe weather events, such as drought and flooding.

We now have a full review of our potential climate risks over a period of nearly 35 years. A total of **86 potential risks were identified**, and after a full gap analysis (looking at relevance and significance), **50 were carried forward for detailed assessment**. We previously concentrated on eight core risks.



86
potential risks were identified.



50
were carried forward for detailed assessment.

Innovating to support the low-carbon transition

Our innovation and Research and Development (R&D) portfolio enables us to identify and target carbon savings for our own operations and we are also developing innovation projects to ensure we are prepared for, and play a pivotal role in, the decarbonisation of energy for power, heat, transport and industry.

In FY22, Ofgem's strategic innovation fund awarded us £400,000 for three projects that will help develop a net zero electric transmission network, including replacing SF₆ with a low-carbon alternative and utilising satellite data analytics to future-proof against the impacts of climate change.



For more information on our Climate Change Risk Tool, please visit: <https://www.nationalgrid.com/document/146731/download> (page 76-77)



Case study: Deeside Centre for Innovation

National Grid's Deeside Centre for Innovation in North Wales has facilities set up ready for industry participants to trial and assess new technological developments before they go into service on the network.

We are currently trialling two new innovative projects to cut harmful environmental emissions. Working with UK-based Rawwater, we have started work on delivering a novel method of sealing harmful environmental SF₆ leaks by reducing emissions from small-bore pipework.

Another key innovation project currently underway is the testing of a new patented concrete mixture called Cemfree (owned by DB Group), which potentially has a carbon footprint of 80 per cent less than conventional types. Typical barriers to adoption of innovative concrete products include how they will behave on site and long-term durability. To address this, we are currently testing two large-scale slabs (c.50 cubic metres) to identify the differences in performance between Cemfree and a conventional concrete.

**Our Annual
Environmental
Report
2022**

Introduction

Net zero carbon
emissions

**Sustainable use
of resources**

Nature positive

Leadership
for change

Looking ahead

Performance
tables

Contact us





Sustainable use of resources



Overview

We will achieve zero waste to landfill and use circular economy principles to make the most out of natural resources and our assets.



Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us



External context

The world collects 11 billion tonnes of waste every year, according to the United Nations Environment Programme. Waste is congesting our oceans, spoiling our landscapes, as well as contributing to harmful landfill and greenhouse gas emissions.

We urgently need to use resources more efficiently, to reduce the strain we are putting on our planet as the global population grows. By taking a circular approach to materials management, which reduces waste and keeps products and materials in use, we can bring out significant economic and environmental benefits.

Our 2026 commitments

Roll over the panels to find out how we performed in FY22

Managing construction waste

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

Our construction projects produce the largest proportion of waste from across our business. It is a priority for us to find ways to improve our recycling rates, reduce our waste intensity and ensure our waste is diverted from landfill as much as is feasibly possible.

FY22 performance

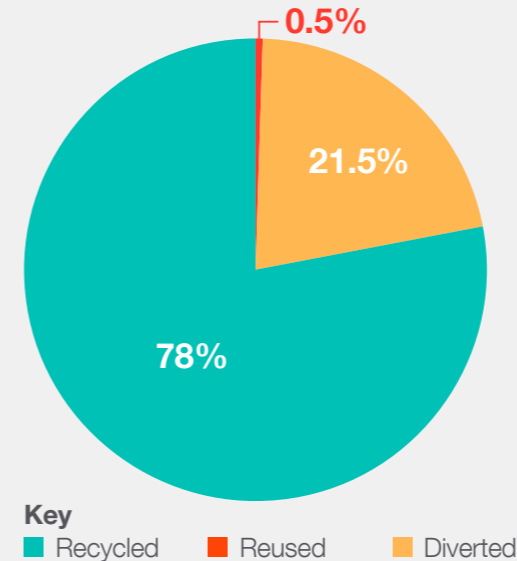
In 2021/22, we achieved 100 per cent landfill diversion across our construction projects.

This year we also obtained baseline data for waste intensity and recycling. Waste intensity was calculated as 871 tonnes per million pounds spent, and 77.9 per cent of construction waste was recycled in FY22. We will use these baselines to set targets for waste intensity and recycling in FY23 once we improve our understanding of the data and have benchmarked against other companies and industries*.

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.

Figure 5. Construction waste destinations



*Please see pages 7-8 of our annex to read more on our construction waste methodology



Case study: Construction Waste Working Group

In FY22 we created a Construction Waste Working Group with members from our key delivery units. Our aim is to:

- improve the accuracy and quality of waste data being reported
- agree meaningful targets for waste intensity and recycling
- agree an Engagement Strategy with our contractors on future collaboration and to share best practice.

This will enable us to manage and deliver strategic improvements in our construction waste performance.



100%
construction waste diverted from landfill.



78%
of construction waste recycled.



871
tonnes/£m construction waste intensity.

Resource efficiency

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

We are focusing on improving resource use within our operations and our offices.

Our aim is to increase recycling rates in our substations and reduce the amount of waste we create and water we use in our offices. We are doing this by influencing a change in employee behaviour, and across our supply chain and contractors.

Operational recycling

Recycling generated from our operational sites saw an increase to 52.8 per cent compared to a 2019/2020 baseline. We will be looking to improve on this performance by continuing to focus on the correct segregation and ensure that we recycle as much as we can to minimise landfill waste.

Office waste reduction and recycling

We achieved a recycling rate of 53 per cent at our offices and achieved a waste reduction of 55 per cent compared to a 2019/2020 baseline. This is primarily attributed to low occupancy levels as our workforce adopt a hybrid model of working to follow Covid-19 procedures. We expect the waste tonnage to increase in 2022/23 as our workforce returns to the office on a more regular basis.

As we move into FY23, further initiatives are to be deployed throughout the core estate to ensure that these are kept at this level or higher.



53%
office and operational recycling rate.



-53%
in office water use.



Water use

Water use in our offices saw a reduction in volume of 53 per cent from a 2019/2020 baseline. We installed water meters in our Head Office, National Grid House, and also implemented water conservation measures which we will continue to adopt to yield savings as more of our workforce returns to the office. In FY23 we will undertake site water efficiency audits at high intensity sites to identify further water use reduction measures and implement water saving measures such as rainwater harvesting at our sites.



Case study: Replacing single-use plastic

We have worked hard to remove single-use plastics from our offices. Our aim is to eliminate single-use plastics from sale at our offices by engaging with staff to set them aside for more sustainable alternatives. We have avoided millions of pieces of single-use plastic since we started this programme, and there are only a few plastic waste streams left in our offices to replace.

Alignment to internationally recognised standards

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

We are aligning our business to internationally recognised standards such as BS:8001 – Circular Economy Standard and ISO 20400 Sustainable Sourcing to ensure we are following best practice across the industry to deliver value to stakeholders and consumers.

Circular economy principles

There is an ever-increasing demand on the earth's resources so it is essential that we make the most of all the materials we use. In FY22 we completed a gap analysis in relation to the BS:8001 circular economy principles. We determined that the business is currently at 'Level 1 – Basic'.

Although there are many things we already do, such as our refurbishment and oil management strategies, there is plenty of room for improvement. Our next step is to obtain clear direction from the business on where we aim to be in our circular economy maturity levels to fully embed these principles within our business.



Alignment to ISO 20400

Adopting the principles of ISO 20400, the international standard for sustainable procurement, we continually assess our approach to embedding sustainability into the procurement function in the UK. In FY22 we used the ISO 20400 online gap analysis/self-assessment tool to identify and make improvements through:

- better integration of sustainability into Procurement Policy and strategy
- embedding sustainability in the core procurement processes and sourcing decisions.



Refurbishing our way to lower CO₂

We have dedicated refurbishment centres in Doncaster and Leicester. Where possible, we refurbish -> replace -> dispose of our assets. Our refurbishment programme covers circuit breakers, disconnectors and earth switches.

Electricity Transmission's (ET's) refurbishment centres are saving millions of tonnes of carbon dioxide each year.



Recycling is oil in a day's work

Our Oil Management Units in Doncaster and Dartford allow us to remove dirty oil from assets during maintenance. Reconditioned oil is then used to refill circuit breakers – reusing 100 per cent of the oil.

We will recycle 700,000 litres of oil at our Oil Management Units between 2021–2026.

Maintaining our high standards of environmental management

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

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 (accredited to ISO 14001:2015) to protect the environment and reduce risks of environmental incidents.

Maintaining ISO 14001 certification

Our Environmental Management System – externally verified by a third-party auditor – promotes continued improvement of environmental management. Following a successful ISO 14001 audit in 2020/21, we have retained our certification to the 2015 environmental management standard until January 2023.

Table 5. 2021/22 Category 1 environmental incidents

Incident type	Number of incidents	Incident description
Fluid filled cable oil release	Two	+
Transformer oil loss	One	+
Wildlife	One	+

Our definition of a Category 1 incident is an incident which results in significant environmental harm or damage, or is significant to us as a business. These incidents are reportable to the regulatory authority.

Our most recent FY22 certification audit in August 2022, identified a major non-conformance in relation to management of oil loss requiring a further assessment to be undertaken ahead of NGET recertification to ISO 14001 in FY23.

Environmental incidents

In FY22, 123 environmental incidents were reported, this is a reduction from 158 incidents reported last year. We have an internal environmental incident classification to drive the right behaviours and learning into our organisation. This enables us to classify any environmental incidents from the least severe (near misses) to most significant (Category 1). In FY22, we had four Category 1 incidents. This is a reduction from eight last year.

Maintaining our high standards of environmental management

We regularly visit our operational sites to ensure that we continually maintain our high standards of oil containment and pollution management. In FY22 we conducted a total of 64 site visits across the UK.

What's next?

Oil leaks from transformers are increasing, partly due to their age. This presents a risk to the environment if released to ground or surface waters. We have started preparing a plan to reduce the risk of transformer oil leaks in FY23. This will support us in managing and reducing the risk of environmental incidents, particularly from oil containing plants.



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

**Mike Bailey,
Environment Technical Lead**

**Our Annual
Environmental
Report
2022**

Introduction

Net zero carbon
emissions

Sustainable use
of resources

Nature positive

Leadership
for change

Looking ahead

Performance
tables

Contact us





Nature positive



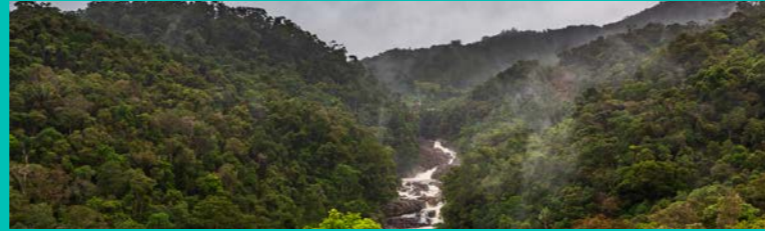
Overview

We are a major landowner in the UK. We own around 1,800 hectares of non-operational land, which includes a rich variety of natural habitats from ancient woodland to peat bogs. It's important to us that we manage the land we own in ways that create the most value for us and our stakeholders, and for the wider environment in which we operate.

As we upgrade the electricity transmission network and develop proposals to connect new electricity generation sources, we also want to minimise our impacts on the natural environment as far as possible.

We will value nature, and will protect and enhance it where possible using natural capital and net gain principles.

Primary UN Sustainable Development Goal



External context

The global biodiversity crisis is one of the most important challenges facing humanity, alongside the climate emergency. Biodiversity loss is currently being experienced at a faster rate than ever before. This matters to us because biodiversity is fundamental to our human life, from regulating our climate to providing us with raw materials. Biodiversity loss also limits our ability to adapt to the impacts of climate change.

Alarming statistics forecast the number of species at risk of extinction within the near future, and without appropriate action to prevent further loss and fragmentation of habitats across the globe, the negative impacts will be felt across current and future generations.

The UK government's primary goal for environmental policy over the last few years has been the overarching ambition to "leave the environment in a better state for the next generation", rightly emphasising the need to deliver environmental net gain.

Nations are also committing to halt biodiversity loss and take actions to protect the world's priceless assets both on land and within our oceans and seas.

Our 2026 commitments

Roll over the panels to find out how we performed in FY22

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

Enhancing the environmental value of our non-operational land

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

Due to the size and nature of our landholding, we can have a significant impact on the natural environment at our sites. We can respond to the depletion of the natural environment and the biodiversity crisis by taking a different approach to the way we manage our sites. We have committed to improve the environmental value of our UK non-operational land by at least 10 per cent by 2026, and we have a five-year delivery strategy to achieve this.

FY22 performance

In 2021/22, we achieved a 1.4 per cent improvement in environmental value of non-operational land, outperforming our 1 per cent enhancement target. This is a projected increase based on the implementation of the actions of our 10-year partnership agreements with environmental organisations at three of our electricity substation sites – **Bainton Heath** (Langdyke Countryside Trust), **Bishop’s Wood Environmental Education Centre** (Field Studies Council) and **Ninfield** (The Conservation Volunteers).

We also introduced a 10-year habitat management plan to protect and enhance the precious ancient woodland at our **Bramley** substation and have begun working with the local Basingstoke Beekeepers to increase local pollination levels.

Environmental value opportunities that we will be implementing include:

-  Wildflower meadow creation (an important food source for local pollinators)
-  Woodland restoration and management (one of Britain’s richest and most diverse habitats)
-  Hedgerow and tree planting (to increase habitat connectivity)

Measuring environmental value

In 2015 we developed a tool to measure the environmental and societal value of our land. This tool uses a ‘natural capital’ evaluation approach that monetises the ‘ecosystem services’ that are provided by our land. Working in partnership with local, regional and national stakeholders, we use this natural capital tool to identify better ways of managing our non-operational land and increase environmental value. For more information, please see pages 12–13 of our [methodology annex](#).

[Click here for data on our non-operational sites enhanced with environmental value.](#)

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 to meet and exceed our 10 per cent enhancement commitment by 2026.



What is natural capital?

Nature provides us with services that are essential for businesses to function, like regulating our climate, giving us clean air, and providing us with food or water sources. The assets that deliver these services are known as natural capital. By placing a monetary value on our natural assets, we can translate environmental benefits into a language that everyone understands.

Figure 6. Ecosystem services evaluated by our Natural Capital Tool



Delivering biodiversity net gain

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

As we build and maintain our electricity assets, we have an impact on the land and local habitats. It is essential that we do so in ways that seek to reduce the fragmentation of our habitats and species, prevent permanent habitat loss, and ensure that we can deliver positive enhancements.

We will minimise the impact of our construction projects and deliver at least 10 per cent 'environmental net gain' as a result of our works. We are going further than 'no net loss'.

FY22 performance

All ten of our construction projects sanctioned this year in scope of our net gain commitment have committed and forecasted to provide a minimum 10 per cent biodiversity net gain. Six schemes have committed to 15 per cent or more.

We have achieved this commitment by giving careful consideration to avoiding impacts to biodiversity features and doing whatever possible to minimise the loss of biodiversity. Where our impacts cannot be fully mitigated and net gain cannot be achieved within the footprint of our development, we have identified strategic partners to deliver biodiversity gains elsewhere that contribute to wider biodiversity strategies.



100%

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



>15%

net gain commitment in six construction projects.

How do we record net gain?

We calculate our impacts on the natural environment using the Department for Environment, Food and Rural Affairs (Defra) Biodiversity Metric calculator Version 3. The Defra metric is the industry standard tool and allows us to quantify the impacts of our construction activities against baseline habitat. For more information, please see pages 12–13 of our [methodology annex](#).

[Click here for data on our construction schemes delivering biodiversity net gain.](#)

What's next?

We will continue to work with external partners to deliver meaningful contributions to wider strategic priorities such as Nature Recovery Networks. We will also implement measurement of natural capital value to complement our biodiversity net gain processes.



What is net gain?

It is development that leaves the biodiversity of the natural environment in a measurably better state than it was found. Where our impacts cannot be totally avoided, we work with partners to develop mitigation measures and enhancements that contribute towards local, regional and national objectives for nature conservation. By doing this, we ensure the environment is improved as a result of our works.



Delivering biodiversity net gain (continued)

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

Net gain in partnership

We are working with stakeholders and partner organisations to share the benefits of biodiversity net gain when it is not possible to mitigate our impacts on site.



Case study: Fiddlers Ferry 275kV Substation pipeline

At our Fiddlers Ferry 275kV Substation site in Warrington, we are undertaking construction activities to separate the utility services from the power station that has been decommissioned. The impact from this work cannot be mitigated on site and therefore we are working in partnership with the Lancashire and South Manchester Wildlife Trust to deliver offsite net gain focusing on an enhancement project to re-wet a peat bog via a series of bunds and hydrology interventions within a Site of Specific Scientific Interest (SSSI). By doing this the condition of the peat bog will improve and is forecasted to achieve **27 per cent net gain.**



The benefits

Re-wetting a peat bog has many environmental benefits around carbon and biodiversity:

- A healthy peat bog prevents the release of this to atmosphere as well as absorbing more year-on-year.
- Supports regrowth of bog species such as sphagnums and round leaf sundews and other key species such as Marsh Gentium. There are other biodiversity benefits for birds, butterflies and bees.

As part of this project, we are supporting the Wildlife Trusts' wider strategic objectives to encourage people to engage with nature. The bog is accessible to the public and improvements to its condition will enhance the experience for visitors.



We are committed to leaving nature in a better state than when we found it by adopting net gain principles. We are going above and beyond what is required by law by delivering a 10 per cent net gain minimum in all our projects, and trying to exceed that where we can."

Roisin Quinn, Director of Customer Connections

Visual amenity

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

As the electricity transmission owner in England and Wales, we intend to reduce the visual impact of existing electricity transmission lines in National Parks and Areas of Outstanding Natural Beauty (AONBs).

National Parks and AONBs are nationally important landscapes with statutory protection. At National Grid we are playing our part in conserving and enhancing the natural beauty, wildlife and cultural heritage of these landscapes. By making use of the £500m provision by Ofgem, we will do as much as we possibly can to conserve and enhance England and Wales's most valued landscapes.

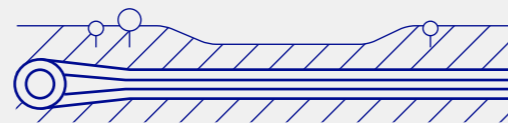
Progress made in FY22

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

- **Dorset AONB project:** In 2018, Ofgem approved funding. Construction work has been progressing to deliver the first Visual Impact Provision (VIP) project with an output delivery date of 2022, at which time 22 pylons will be removed from the landscape and enhance the Dorset AONB back to its former glory..

Table 8. Visual amenity

Unit	2021/22
Removal of overhead lines (km)	0
Non-technical mitigation projects started (number)	8
Non-technical mitigation project (£m)	circa £1m



51 pylons

to be replaced by underground cable

- **The Peak East project:** We will remove 1.8km of overhead line and 8 pylons from the landscape by the end of 2023. Planning approvals were obtained in September 2020 and funding was approved by Ofgem in February 2021. Main construction work began on site in May 2021.
- **Snowdonia project:** We are seeking to remove 3km of overhead line and 10 pylons from the landscape. Planning consent was granted in December 2020 and the funding submission made in March 2021; Ofgem's determination is expected in summer 2022.
- **North Wessex Downs AONB:** This project is in development for potential planning and funding submissions in the summer of 2022. The project is seeking to remove 4.4km of overhead line and 13 pylons, replacing these with an underground cable system.



What next?

We have begun work on the next candidate for undergrounding in the Cotswolds AONB, as requested by the VIP Stakeholder Advisory Group. This project is still in early development and would be funded as a RIIO-2 project. The project is looking at a section of line for potential undergrounding and other visual mitigation measures where appropriate.



For more information on VIP, please visit: <https://www.nationalgrid.com/electricity-transmission/network-and-infrastructure/visual-impact-provision>



The VIP project represents a major opportunity to conserve and enhance the natural beauty, wildlife, and environmental heritage within our most protected landscapes.”

Ben Smith, VIP Project Manager

**Our Annual
Environmental
Report
2022**

Introduction

Net zero carbon
emissions

Sustainable use
of resources

Nature positive

**Leadership
for change**

Looking ahead

Performance
tables

Contact us



**Leadership
for
change**



Leadership for change



Overview

We are responsible for building the networks that will support a net zero economy by 2050, but we need to ensure that we deliver this in the most sustainable way.

We aim to be an environmental leader in our industry. To do this we need to instill the right culture, which has sustainability at the centre of decision making. With the right leadership, engagement and collaboration, we will make our environmental commitments happen.



External context

Our global society faces environmental, social, economic and political crises. The role that businesses play in supporting the changes needed to overcome these challenges is more important than ever before.

We share the belief that businesses need to stand for something more than profitability. Now, more than ever, we have a responsibility to demonstrate our contribution to society in tackling a wide range of environmental issues, and lead by example.

Our 2026 commitments

Roll over the panels to find out how we performed in FY22

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

Internal leadership and engagement

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

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 and lead by example.

This means we have a director that leads or champions a specific commitment. If a commitment goes off track, we have a champion in the senior leadership team to resolve issues and help guide us back in the right direction.

We've appointed a new leadership team. They are leading us on our transition to a clean energy future.



Alice Delahunty
President



Matt Staley
Director of Asset Operations



Zac Richardson
Director of New Infrastructure



Roisin Quinn
Director of Customer Connections



Lydia Ogilvie
Director of Network Strategy and Operations



Noha Wagdy
Director of Safety, Risk and Compliance



Chris Bennett
Director of Regulation

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 72 per cent engagement score on responsible business, an improvement from 71 per cent last year but below our target of 75 per cent.

We will continue to engage with our employees through additional training, environmental working groups, newsletters, and environmental engagement site visits to make further improvements to our score.



100%
senior leadership accountability.



72%
employee engagement.



It's vitally important that all of our employees are engaged with the environmental commitments we have made so that they are empowered to play their part in enabling the energy transition for all."

Noha Wagdy, Director of Safety, Risk and Compliance

Working collaboratively with Transmission Owners

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

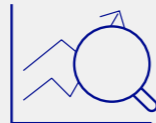
Contact us

We are working collaboratively with the other Transmission Owners to develop an industry-wide, consistent approach to capital carbon management and natural capital assessment. We want to share best practice and hold a common approach throughout our industry.

Consistent approach to reducing whole life carbon

We worked with Scottish Power Energy Networks (SPEN) and Scottish and Southern Energy Networks (SSEN) to form the UK Reduction of Capital Carbon in Infrastructure: Transmission (ROCCIT) group. ROCCIT promotes an industry-wide, consistent approach to reducing whole life carbon for infrastructure projects we design and build across transmission. This also provides an efficient and transparent methodology to share with contractors and supply chain partners.

Jointly, we published a common methodology and dataset for capital carbon management; the Carbon Asset Database (CA_t). This holds common carbon data used to calculate the carbon footprint of construction projects. The UK ROCCIT group will continue to work collaboratively to share best practice across RIIO-T2.



Published

Common methodology and dataset for capital carbon management.

Assessing natural capital impacts consistently across the UK

To ensure that the ecosystem services from our natural assets are considered as part of the decision-making processes, we have committed to working collaboratively to develop and pilot a common and robust methodology for assessing natural capital impacts.

In FY22, we worked with the other Transmission Owners (SPEN and SSEN) to review the range of tools available, explore the development of a new approach with various Ecosystem Service Valuation providers and identified two tools to pilot: Natural Capital Research (NCR) and AECOM Natural Capital Lab (NCL). The outcome of the pilots will enable us to develop a robust natural capital methodology across transmission in 2022/23.



2

Ecosystem Service Valuation providers shortlisted.



Taking bold steps to tackle our SF₆ emissions

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

A new alternative, more sustainable gas is needed to replace SF₆ entirely. Leading the way means being bold and stimulating the market for cleaner and greener alternatives in order to address our SF₆ emissions. It means driving forward industry in areas where we are leading by example.

Alternative technology to SF₆ is rapidly evolving

We have led the way in Great Britain, collaborating with several manufacturers to find commercially viable alternatives with a lower global warming potential. In 2018 we achieved an industry milestone with the energisation of the first SF₆-free 420 kV gas-insulated line in the South East. A world first, using GE's G3 with a global warming potential (GWP) of 328.

In 2019, we introduced a new SF₆ policy that positions us as not putting any more SF₆ into the network when there is an alternative. SF₆ technologies are no longer proactively pursued, progressively adopted and installed as they become technically and commercially viable.

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.

FY22 progress

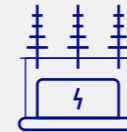
In FY22, we continued to make good progress:

~~SF₆~~

- We did not procure any SF₆ when a commercial alternative was available.

Hitachi Energy

- We partnered with Hitachi Energy in a pilot project at Richborough Substation in Kent to develop and deploy a new solution to replace the greenhouse gas Sulphur Hexafluoride (SF₆) with a greener alternative (EconIQ™ – GWP of 912).



- We are building a new modern substation at our Littlebrook 400kV Substation using G3.

Next steps

Volumes and cost to a zero SF₆ inventory position will include additional challenges to our business. The areas most likely to be affected are future customer connections, network design changes of the transmission system and wider asset portfolio health and plans. This may have an impact on both delivery time and cost.

We need to do further work to understand how we can continue to reduce our SF₆ inventory while navigating the additional challenges to our business.



Taking bold steps to tackle our SF₆ emissions (continued)

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

Case study:

Project highlight – Richborough

A large proportion of SF₆ in the UK is used in gas insulated busbars and we are working with equipment manufacturers and researchers to explore the possibility of retro-filling these assets with alternative gases.

This is technically challenging, but we have recently commissioned a world-first pilot project at our Richborough 400 kV substation that has removed 755kg of SF₆ from existing GIB. Hitachi Energy's EconIQ™ is the world's first SF₆ replacement product for installed gas-insulated switchgear. Using this new solution means that we can avoid the environmental impact and cost of replacing equipment, which is otherwise fit for many more years' service.

Our SF₆ alternatives project at Richborough 400 kV substation delivers around a 99 per cent reduction in carbon dioxide equivalent, while keeping reliability high.

We have identified circa 28 more tonnes of SF₆ within assets of the same design across our UK network and we will be working with all of our key Original Equipment Manufacturers to explore further extension of this approach.



From 2026, every year, five sites will need the SF₆ removing from Gas Insulated Switchgear (GIS) assets to achieve zero SF₆ inventory by 2050. We must not underestimate the scale of the challenge ahead of us.”

**Chris Bennett,
Director of Regulation**

Leadership for change

Being an environmental leader

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

We are leading the way

In FY22 we contributed to a number of initiatives and environment and sustainability issues because we understand the urgent need to help shape our industry on the low-carbon transition. Our leadership highlights this year include:

For more information, please click on each of the dates below.

June 2021
Joining EV100



October 2021
Joining Get Nature Positive



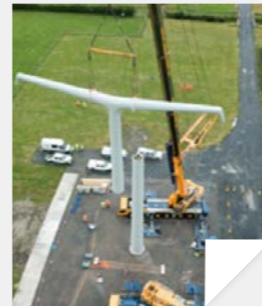
December 2021
Partnering with Hitachi Energy to develop an SF₆ alternative



March 2022
Becoming an EDIE Sustainability finalist



September 2021
Building the world's first T-pylon



November 2021
Principal Partner for COP26



January 2022
Obtaining scope 1 & 2 SBTi verification



Being an environmental leader

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

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:

Our memberships

- 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)
- The Major Infrastructure Resource Optimisation Group (Mi-Rog)
- Supply Chain Sustainability School
- Valuing Nature Network
- UK Business Biodiversity Forum
- Energy Networks Association

National Grid is proud to share reporting data and have its sustainable efforts analysed, collaborating with global organisations and participating in sustainable initiatives. National Grid is confident it can deliver its responsible business commitments.

 **For more information on awards and recognition, please visit: nationalgrid.com/investors/environmental-social-and-governance**



Case study: COP26 principal partner

In 2021/22, we became a Principal Partner of COP26, the world's most significant summit on climate change, which was hosted in the UK in November 2021. Being a COP26 Principal Partner enables us to call for more ambitious action towards a clean, fair and affordable energy future and to demonstrate the actions businesses like ours are taking.

In the run-up to COP26, we ran a major campaign to help people learn more about the clean energy transition and how they could get involved. We called it the *Power of All* and it involved a range of exciting initiatives, such as our *Green Light Signal* and *WhenToPlugIn* app which tell you when the electricity in your home is coming from clean and green energy sources.

The COP26 summit was attended by 87 of our colleagues, including our Chief Executive, other Executive Committee members and 18 colleagues who volunteered to help it run smoothly. We hosted 30 events and colleagues spoke at, or participated in, more than 130 others. Meetings involving many of our stakeholders were held to discuss how collaboration could be improved to accelerate the energy transition.

We took action for colleagues and stakeholders who couldn't be there, livestreaming our events, speaking to media and sharing great content on Twitter, Instagram, Facebook and our internal channels.

**Our Annual
Environmental
Report
2022**

Introduction

Net zero carbon
emissions

Sustainable use
of resources

Nature positive

Leadership
for change

Looking ahead

Performance
tables

Contact us



**Looking
ahead**

Responding to a changing world

Our success depends on understanding and responding to the changing world in which we operate. In December 2021, we did an internal and external review of our EAP. This involved looking at our business and external context.

External landscape

IPPC Sixth Assessment Report: highlighted the importance of limiting global warming to 1.5 degrees. Every fraction of a degree of warming leads to more dangerous and costly impacts.

COP26: The 2021 United Nations Climate Change Conference (COP26) succeeded in getting 197 countries to align on the Glasgow Climate Pact and other landmark pledges including: phasing out coal use in the 2030s, accelerating the transition to zero emission vehicles globally and signing a pledge to end world deforestation by 2030.

Environment Act 2021: Once in force, all new developments will be legally required to demonstrate a 10 per cent biodiversity net gain, extending to nationally significant infrastructure projects or every new planning permission.

Nature Positive 2030 report: recommends businesses, organisations, cities and governments adopt targets to become Nature Positive – putting the crises of biodiversity loss and climate change on an equal footing.

RIIO-ED2: In December 2021, Distribution Network Owners (DNOs) submitted their draft Environmental Action Plans (EAPs). We benchmarked their commitments against ours.

Covid-19: Due to the on-going impacts of the Covid-19 pandemic and a big proportion of our staff being asked to work from home, we saw increased levels of environmental performance particularly around resource use and travel.

COP15: Convention of Biological Diversity – Expectations for post-2020 Biodiversity Framework and impacts on business in terms of dependencies on nature, inclusion of nature’s value in decision making and nature-based disclosures.

Changes for FY23

We will be making the following changes to our EAP in FY23:

- Some changes relate to language and terminology: we want our sustainability outcomes to be aligned to the terminology used by our stakeholders. We will be using zero emissions vehicles (ZEVs) rather than Alternative Fuel Vehicles (AFVs) and using Nature Positive, instead of Caring for the natural environment. Some of these changes are already incorporated into this year’s report.
- We will be including new commitments in our EAP: we want to show our willingness to do more in relation to the decarbonisation of transport, fossil fuels and oil management.

By 2026, we will:

- install 252 charging sites
- ensure 100 per cent of Band A–C company cars will be EVs
- develop an oil leakage reduction strategy
- develop the phasing out of diesel generators.

We will be reporting on new commitments from FY23. Our net zero commitments already align to a 1.5 degree trajectory in line with the IPPC and COP26 goals. We also have a business commitment to deliver 10 per cent net gain on all our construction projects. We have not made any changes to these commitments.



Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

Introduction

Net zero carbon
emissions

Sustainable use
of resources

Nature positive

Leadership
for change

Looking ahead

**Performance
tables**

Contact us



**Performance
tables**

FY22 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 price control 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

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

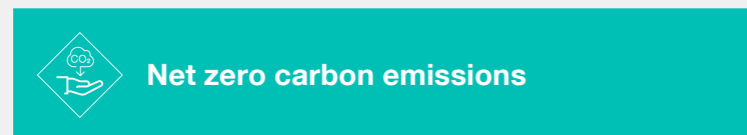
Performance tables

Contact us

EAP commitment	Metric	Description and expected benefit	Implementation milestones					RAG	Status update
			FY22	FY23	FY24	FY25	FY26		
Achieve net zero for our scope 1 and 2 emissions by 2050, with interim targets of: 34% by 2026 and 50% by 2030.	% 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	-16.4% reduction in scope 1 and 2 emissions achieved in FY22. This was greatly due to reductions in SF ₆ leakage.
Purchase 100% of electricity we use from renewables.	% of renewable energy supplied.	No greenhouse gas emissions from fossil fuels.	Prepare for the Powered purchase agreement (PPA) to be in place.	Powered purchase agreement (PPA) in place.	100% of renewable energy supplied.	100% of renewable energy supplied.	100% of renewable energy supplied.	G	Power Purchase Agreement to be in place in FY22/23.
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 50 nominated sites and utilise the recommendations to provide a plan.	TBC	TBC	TBC	G	Programme strategy and annual milestones set up.
Focus on an efficiency-first approach to decrease the carbon emissions from our office energy use by 20% from a 2019/20 baseline.	% reduction in CO ₂ from energy use.	Reduction in carbon emissions from energy use in our offices.	-4%	-8%	-12%	-16%	-20%	G	-19.3% in carbon from energy use achieved in FY22.
Replace 60% of our fleet with Zero Emissions Vehicles (ZEVs).	% of vehicles replaced with ZEVs.	Reduction in carbon emissions from operational travel.	+10%	+19%	+27%	+43%	+60%	G	10% target achieved in FY22 with 87 electric fleet vehicles.
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	-39.8% in carbon emissions from business travel achieved in FY22.
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.			A	Recruitment is underway to ensure resources in place to deliver the Tx Losses Strategy update in FY23, following on from RIIO-T1 published position.
Deliver carbon neutral construction.	Net zero 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.	10% year-on-year reduction.	10% year-on-year reduction.	Carbon neutral construction.	A	4.5% increase in capital carbon intensity from FY21.
75% of National Grid's top 250 suppliers (by category/spend) will have carbon reduction targets.	% of suppliers with carbon reduction targets.	Reductions in carbon emissions from our supply chain.	+70%	+72%	+73%	+74%	+75%	G	74% of UK allocated suppliers within the top 250 have carbon reduction targets in FY22.

Data tables

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



Net zero carbon emissions headlines		FY 2021/22
Annual change in Insulation and Interruption Gas emissions (%)		13.8%
Low-carbon and renewable energy capacity connected to the network (MW)		1,869MW
Investment into innovation activities primarily supporting decarbonisation and/or protecting the environment (£)		£0.4m

Scope 1 & 2 emissions		FY 2021/22
Scope 1 – Fugitive emissions	IIGs (tCO ₂ e)	229,528
Scope 1 – Operational transport	Direct commercial vehicles (tCO ₂ e)	5,255
Scope 2 – Building energy use	Buildings – office depots electricity (tCO ₂ e)	1,849
	Buildings – other fuels (tCO ₂ e)	308
	Substation electricity (tCO ₂ e)	12,984
Scope 2 – Electricity losses (tCO ₂ e)		1,152,795
Total including losses (tCO₂e)		1,402,716
Total excluding losses (tCO₂e)		249,924

IIG type	FY 2021/22
Total IIG emissions (tCO ₂ e)	229,528
SF ₆ emissions (tCO ₂ e)	227,198
SF ₆ /N ₂ (tCO ₂ e)	2,327.15
Leakage rate (%)	1.06
Interventions per annum (number)	29
Estimated impact of interventions (tCO ₂ e avoided or abated)	9,905.5

Transmission losses	FY 2021/22
Annual losses (TWh)	5.42926
Share of total electricity (%)	2.08%
CO ₂ emissions (tCO ₂)	1,152,995

Capital carbon	FY 21/22
Capital carbon intensity (tCO ₂ /£m)	163

Supply chain	FY 2021/22
Percentage of suppliers meeting our supplier code	74%
Percentage of suppliers that have their own sustainability metrics or KPIs	74%

Introduction

Net zero carbon
emissions

Sustainable use
of resources

Nature positive

Leadership
for change

Looking ahead

Performance
tables

Contact us

**Our Annual
Environmental
Report
2022**

Introduction

Net zero carbon
emissions

Sustainable use
of resources

Nature positive

Leadership
for change

Looking ahead

Performance
tables

Contact us



**Contact
us**

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: nationalgrid.com/uk/electricity-transmission/our-environmental-future

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

For more information on our approach to responsible business, please visit: nationalgrid.com/responsibility

For more information on our Just Transition strategy, please visit: nationalgrid.com/document/146721/download

National Grid
National Grid House
Warwick Technology Park
Gallows Hill
Warwick
CV34 6DA
nationalgrid.com

Introduction

Net zero carbon
emissions

Sustainable use
of resources

Nature positive

Leadership
for change

Looking ahead

Performance
tables

Contact us



Independent Assurance Statement to National Grid Electricity Transmission PLC

ERM Certification and Verification Services Limited ('ERM CVS') was engaged by National Grid Electricity Transmission PLC ('National Grid') to provide limited assurance in relation to the information set out below and presented in its 2022 Annual Environmental Report (the 'Report') for the reporting year 1 April 2021 to 31 March 2022.

Engagement summary	
Scope of our assurance engagement	Whether FY22 progress against EAP commitments in the Performance tables on page 44 are fairly presented in the Report, in all material respects, in accordance with the reporting criteria:
Reporting period	1 April 2021 to 31 March 2022
Reporting criteria	Reporting criteria and basis of preparation: Annual Environmental Report 2022.
Assurance standard	International Standard on Assurance Engagements ISAE 3000 (Revised).
Assurance level	Limited Assurance.
Respective responsibilities	National Grid is responsible for preparing the Report and for the collection and presentation of the information within it. ERM CVS' responsibility is to provide a conclusion on the agreed scope based on the assurance activities performed and exercising our professional judgement.

Our conclusion

Based on our activities, as described below, nothing has come to our attention to indicate that FY22 progress against EAP commitments in the Performance tables on page 44 are not fairly presented in the Report, in all material respects, with the reporting criteria.

Our assurance activities

A multi-disciplinary team of sustainability and assurance specialists performed a range of assurance procedures which varied across the disclosures covered by our assurance engagement, as follows:

- A visit to National Grid Headquarters (Warwick, UK) to interview relevant staff to understand and evaluate the data management systems and processes (including systems and internal review processes) used for collecting and reporting the selected information.

- An analytical review of quantitative information and an assessment of the completeness and accuracy of the corporate data consolidation.
- A review at corporate level of a sample of qualitative and quantitative evidence supporting the reported information including, but not limited to:
 - A review of the results of ISO 140001 certification audits undertaken by ERM CVS in relation to EAP commitments for pollution management, leadership accountability and workforce engagement
 - A review of the outcomes provided to National Grid by other third party assurance providers in relation to EAP commitments for carbon emission reductions
- Review of the presentation of information relevant to the scope of our work in the Report to assess consistency with our findings.

The limitations of our engagement

The reliability of the assured information is subject to inherent uncertainties, given the available methods for determining, calculating or estimating the underlying information. It is important to understand our assurance conclusion in this context.

For EAP commitments relating to reduction of carbon emissions against a baseline, we placed reliance on data subject to third party assurance by other providers and did not undertake any further substantive testing of this information.

Our independence

ERM CVS is a member of the ERM Group. The work that ERM CVS conducts for clients is solely related to independent assurance activities and auditor training. Our processes are designed and implemented to ensure that the work we undertake with clients is free from bias and conflict of interest. ERM CVS and the staff that have undertaken work on this assurance exercise provide no consultancy related services to National Grid in any respect.

Gareth Manning

Partner, Corporate Assurance, London

30 September 2022

ERM Certification and Verification Services Ltd.

www.ermcvs.com

Email: post@ermcvs.com

Introduction

Net zero carbon emissions

Sustainable use of resources

Nature positive

Leadership for change

Looking ahead

Performance tables

Contact us

National Grid plc
National Grid House
Warwick Technology Park
Gallows Hill
Warwick CV34 6DA
United Kingdom

nationalgrid.com