Annual Environmental Report 2022/23

A responsible company preparing for a net zero future

Contents

Welcome to our Annual Environmental Report 2022/23

We have prepared this report in accordance with the RIIO-GD2 Environmental Reporting Guidance provided by Ofgem. It includes data for the reporting period 1 April 2022 to 31 March 2023.

RIIO-GD2 is a five-year price control period, set by our regulator Ofgem. We are publishing this report as part of our licence obligations for the RIIO-GD2 price control, which runs from April 2021 to March 2026.

How to use this report

This is a smart pdf with navigation functionality built into the document. To use, click on the section navigation on the top right of each page to navigate to the section you require or click on the page forward/back arrows to move page by page.

All internal and external links are live and shown in orange. These will connect you with the information when clicked.

The production of the report is an Ofgem licence obligation and covers Southern Gas Networks and Scotland Gas Networks, collectively called SGN.

To stay up to date on our latest news please go to:

sgn.co.uk/news

linkedin.com/company/sgn

facebook.com/sgngas

Overview

We have a vision of giving our customers the best clean energy experience and we have a robust environmental strategy to help us deliver our vision.

SGN at a glance

The SGN Group owns one of the UK's largest and most innovative gas distribution networks, operating across Scotland, southern England and Northern Ireland.

24 hours a day, seven days a week, 365 days a year, our teams are working behind the scenes and out on the streets looking after our 74,000km of pipe network – keeping you safe and the gas flowing to six million homes and businesses in the south of England and across Scotland.

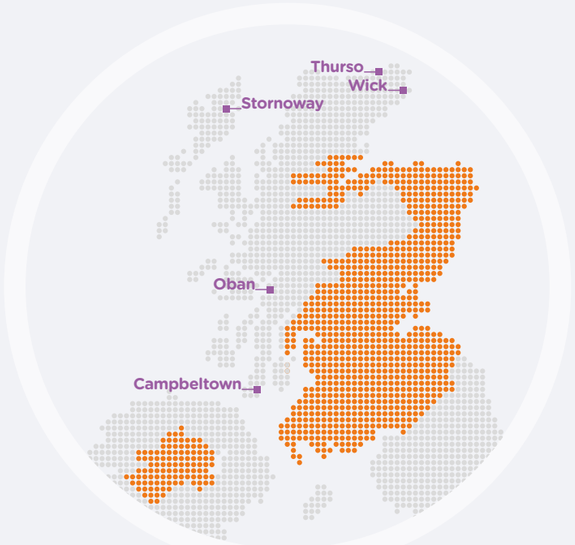
While the SGN Group owns gas networks across England, Scotland and Northern Ireland, this report relates to our regulated businesses operating in Scotland and the south of England.

Our purpose

Serving our communities by keeping everyone safe and warm.

Our vision

To give our customers the best clean energy experience.



Operations throughout the UK

Scotland

Our Scotland network distributes gas across all of Scotland to 75% of households, including remote areas through the Scottish Independent Undertakings (SIUs) at Stornoway, Wick, Thurso, Oban and Campbeltown.

Northern Ireland

In Northern Ireland we are now fully operational with our High Pressure (HP) and Intermediate Pressure (IP) pipelines built and connected. We have also connected a number of large industrial and commercial (I&C) customers and continue to build our domestic customer base. We are also contracted to maintain the gas transmission system and maintain the assets for the gas pipeline connection between Northern Ireland and Scotland.

Southern England

Our Southern network stretches from Milton Keynes in the north, to Dover in the east and Lyme Regis in the west, including London boroughs to the south of the River Thames, distributing gas to around 90% of households.

Key

- SGN head office
- SIUs

The SGN brand portfolio

As our business expands so does our portfolio of brand identifiers under both our regulated and non-regulated activities.

Regulated business

Our regulated businesses form the core of our activities in providing a safe and secure supply of gas to our customers throughout our three gas networks.

SGN Your gas. Our network.
SGN Natural Gas

Non-regulated businesses

Our non-regulated activities are closely aligned with our core business activities, ensuring management understanding and decision making comes from a position of knowledge and experience.

SGN Commercial Services
SGN Connections
SGN Heat Networks
SGN H100 Fife
SGN Metering
SGN Place
SGN Futures

Introducing our report

Climate change requires everyone, everywhere, to act. As a gas distribution network, SGN has a critical role to play in many ways.

Firstly, we can make a vital contribution to the decarbonisation of the energy network. We believe in a 'whole systems' approach to achieving net zero, including the development of the UK's hydrogen economy.

The H100 Fife project, due to go live in 2024, will be the first 100% green hydrogen-to-homes zero carbon network anywhere in the world, providing important evidence to help the UK decarbonise home heating. We are also assessing the viability of repurposing the local transmission system from natural gas to 100% hydrogen through our LTS Futures project. These are just two significant projects which could change the way we use energy in the UK.

Secondly, we take responsibility for our environmental impacts and the effects these have on our climate and the communities in which we operate. I am pleased with the progress we are making through our Environment Strategy to reduce greenhouse gas emissions from our operations and our assets. Our biggest environmental impact is leakage of natural gas to the atmosphere from our networks. Our established programme of replacing old metal pipes with new polyethylene pipes not only reduces this leakage, it also sets up the networks for a potential future of using hydrogen for heat.

As a sector, we still have a long way to go but we are working with the regulator and our partners to accelerate the reduction of leakage.

This report shares our environment successes from 2022/23, including our fantastic biodiversity improvement programme on our disused non-operational land. It also explains some of the challenges we are facing not least accessing appropriate electric vehicles. Despite these issues, we need to continue to make progress and really put an effort into meeting our short-term targets for the current price control.

Finally, we have to take a proactive approach where possible to tackle the risks that come with climate change. Over the last few years, we have seen real impacts on our networks, such as pipeline washouts which endanger security of supply of gas to our customers. Adapting to climate change is becoming ever more important, and the framework of Taskforce for Climate-Related Financial Disclosures (TCFD) helps us to disclose to shareholders and investors how we are doing this. Our first TCFD report was published earlier this year in our Annual Report 2023.

Whether you are reading this report as a customer or an investor, I hope you will find it enlightening and encouraging to see how we are making progress when it comes to protecting the environment and reducing the impacts of climate change.

We really welcome the input from our Environmental Advisory Group and look to work with them on the key areas for progress in 2024.

Laura Sandys
Non-Executive Director

We can make a vital contribution to the decarbonisation of the energy network, achieving net zero through a 'whole systems' approach.

2022 was the hottest year on record in the UK. The impacts of climate change can be felt across the globe, across the country and in our networks. Achieving a net zero economy is the defining challenge of our age, and it makes it an inspiring and challenging time to work in the energy sector.

Our Environment Strategy, aligned with the United Nations Sustainable Development Goals, sees us contributing to the decarbonisation of the energy network, reducing the carbon footprint of our business, improving our environmental impacts and ensuring our networks are resilient to an ever-changing climate. The work we are doing now will help keep our customers safe and warm while making SGN a more sustainable, inclusive business for many years to come.

Mark Wild OBE
Chief Executive Officer

Industry sustainability experts

Our Environment Advisory Panel provides challenge, insight into best practice and acts as a critical friend to support the delivery of our Environment Strategy.

September 2023

A letter from the SGN Environment Advisory Panel

The SGN Environment Advisory Panel was established in February 2021 and comprises five external environment and sustainability experts, supported by key SGN staff. The purpose of the Panel is to provide robust and constructive challenge as a critical friend and to bring external perspectives. The panel holds 4 meetings per year and reviews a draft of the Annual Environment Report.

SGN has asked the panel to provide a statement for inclusion in this, the second Annual Environmental Report, reflecting observations of the panel members.

Over the last two years, SGN has established better quality environmental baseline data and metrics, has delivered initiatives to improve the understanding of material environmental issues, and has renewed focus on significant topics beyond scope 1 and 2 carbon emissions, such as waste management, circularity, embodied carbon in purchased goods and biodiversity. The innovations noted in the report will support decarbonisation and we look forward to seeing them continue to impact carbon reductions across the SGN network. These actions have created a solid basis from which SGN can progress towards environmental goals.

Looking towards the coming year, the panel would like to make 3 observations:

- Given the contribution of shrinkage to SGN's overall carbon footprint, we were pleased to see reductions in leakage from previous years. We would welcome the introduction of interim targets for shrinkage alongside the continuing focus on leakage reduction, an important element of SGN's decarbonisation journey.
- Decarbonisation of the gas network through replacing natural gas with biomethane and hydrogen has the potential to play a key role in the UK achieving net zero. Testing and expanding these networks entails delivery of complex multistakeholder initiatives. We note that both programmes have experienced challenges and delays which could impact achievement of SGN's longer term net zero aspirations.
- There have been significant improvements in the data captured within SGN to measure and monitor environmental performance. Achieving SGN's environmental goals will be supported by visibility of and accountability for environmental metrics and performance being embedded across the business.

The members of the Panel are grateful for the openness and cooperation of the SGN team in responding to our questions and challenges. With a change in Panel membership from the latter half of 2023 we look forward to continuing to be a part of SGN's environmental improvement journey.

Yours sincerely,

Olivia Bertham

Olivia Bertham
SGN Environment Advisory Panel Chair

Olivia Bertham
Director at ORB Sustainability Consulting Ltd and SGN Environment Advisory Panel Chair

Anna Graham
Head of Environment, Science & Innovation at The Scottish Whisky Association

Alan Hendry
Sustainability Director, Mott Macdonald

Maxine Frerk
Chair of SGN's Customer and Stakeholder Engagement Group

Stephen Farrant
Independent Director, Advisor and Sustainable Business Consultant

Environmental responsibilities

Our Environment Strategy is our all-encompassing action plan for becoming a net zero business.

We have an ambition of achieving net zero emissions by 2045. This means we want to get as close to zero greenhouse gas emissions from our network, our operations and our supply chain, and we'll offset residual emissions with Certified Greenhouse Gas Removals (GGRs).

Our Environment Strategy sets out how we'll cut our greenhouse gas emissions across both our networks to net zero by 2045, in line with the Scottish Government's target date for a net zero economy.

It's based on five pillars that demonstrate our long-term environmental ambitions:

- Net zero business carbon emissions
- Engaging with our supply chain
- Boosting biodiversity
- Transitioning towards a circular economy
- Supporting the transition to a hydrogen economy

We've aligned our strategy with the UN Sustainable Development Goals (SDGs).

Designed to be a blueprint for a more sustainable future, the 17 SDGs were set and agreed by world leaders in 2015. They address global challenges around inequality, poverty and climate change, and comprise of 169 targets for governments, businesses and organisations to strive towards.

The SDGs provide an excellent way of describing what we do and what drives us as a business.

We've adopted six of the SDGs as priority goals within our Environment Strategy that we've identified as being material to our organisation and stakeholders.

You'll see us refer to these six goals as we report on our environmental impact this year, starting with our contribution to energy system decarbonisation and continuing through to the local environment.

SGN focus: Contribution to energy system decarbonisation

Why this is material to SGN
Central heating is responsible for up to a third of the UK's greenhouse gas emissions. We need to solve this challenge if we are to meet net zero targets.

Switching natural gas for biomethane and hydrogen, which produce much less or even no carbon when they burn, is one of the ways that we continue to heat homes safely while tackling the climate emergency.

SGN focus: Innovating for decarbonisation and to protect the environment

Why this is material to SGN
The decarbonisation challenge involves the development of new energy carriers, improving energy efficiency, achieving net-zero emissions and creating new markets for carbon and other by-products as part of an increasingly circular economy.

To meet this challenge, we require innovation.

SGN focus: Climate change mitigation

Why this is material to SGN
We have set an ambitious target of reaching net zero emissions across both our networks by 2045, in line with the more ambitious Scottish Government target.

This target encompasses our direct emissions including leakage from our network (scope 1), energy that we purchase from others (scope 2) and indirect emissions from our value chain (scope 3).

SGN focus: Sustainable procurement

Why this is material to SGN
Approximately 45% of our carbon footprint (excluding shrinkage) is attributed to our suppliers. As part of our overall net zero journey, it is vital to engage with our supply chain to implement sustainable practices that will help reduce our carbon footprint.

We've committed to ensuring that at least 80% of our supply chain (by spend) meet our new Sustainable Procurement Code by 2026.

SGN focus: Efficient resource use and circular economy

Why this is material to SGN
The objective of the circular economy is to do more with less. This is achieved through preventing waste or unnecessary resource use in the first place, using sustainable resources, such as secondary raw materials, and prolonging the life of products through reuse, repair, refurbishment and remanufacturing.

When all these options are exhausted, and products or materials reach their end of life then the materials should be recycled.

SGN focus: Local environment

Why this is material to SGN
By improving or restoring the environmental quality and/or biodiversity of sites we own and manage, as well as other locations within our network areas, we can have a profound positive impact on the quality of life and wellbeing of our colleagues and our communities.

We are also committed to making our network more resilient to climate change and maintaining our track record of no reportable environmental incidents.

Environmental responsibilities continued

Environment Policy

From our Environment Strategy comes our Environment Policy. As part of our company-wide Safety Management Framework, we operate an Environment Management System (EMS) to ensure we properly identify and manage environmental risk.

Our EMS has been externally certified to the international ISO 14001:2015 standard since we were formed in 2005. In 2023, we passed the annual audit for the 18th year running with no major non-conformances identified.

We're extremely proud of this long-standing achievement. A key element of the ISO standard is continuous improvement, which is something that we've fully embraced over the years. We view the minor weaknesses identified in the most recent ISO audit as an opportunity for further improvement.

Measuring our carbon emissions

We use the Greenhouse Gas Protocol for measuring emissions, which is the world's most widely used greenhouse gas accounting standards. The protocol classifies a company's emissions into three groups and you'll see us reference these terms throughout our report:

- Scope 1 – emissions from sources owned or controlled by us, including shrinkage and those associated with fuel combustion in boilers and vehicles
- Scope 2 – indirect emissions from the generation of energy we purchase
- Scope 3 – all indirect emissions not produced by us or our assets, but by the products and services we buy and use through our supply chain.

Environmental, Social and Governance reporting

For the second year, we've committed to following the World Economic Forum (WEF) Stakeholder Capitalism Metrics framework for our Environmental, Social and Governance (ESG) reporting. This framework simplifies the plethora of ESG reporting frameworks by breaking down metrics into four comprehensive pillars, making it easy to understand and apply.

Reporting in accordance with WEF's framework, we consider ESG factors in how we operate now and how we plan to operate in the future. We report annually on our ESG performance in our SGN Annual Report.

We're increasingly seeing the impact of climate change on our network and our business. For example, river erosion can lead to pipelines being displaced. This would not only present a safety risk from the compromised pipeline, but it would also impact on the continuity of supply.

It's important we have an appropriate mechanism to track and manage these risks. For the first time this year, we've also reported on how we identify, assess and manage our climate-related risks and opportunities within our SGN Annual Report, using the Taskforce for Climate-related Financial Disclosures (TCFD) framework.

Benchmarking our business performance

For the past six years, we've reported to the not-for-profit global disclosure system CDP, which enables companies, cities, states and regions to manage their environmental impacts. While it's not a regulatory requirement for us to do so, we do this to meet the expectations of our shareholders and investors.

Based on our 2022 CDP disclosure, we're among the top 8% assessed for supplier engagement on climate change globally.

This gives us a rating of A in CDP's leadership band on supplier engagement, which means we're viewed as implementing best practice in engaging with our suppliers on climate change. This rating is higher than the European regional average and higher than the oil and gas storage and transportation sector average, both grade C.

On our CDP climate change benchmark, we scored a B, which is in the management band. This is higher than the oil and gas storage and transportation sector average of C.

Key 2022/23 highlights

We're proud of the progress we've made on our journey towards achieving net zero by 2045 this year.

Achieving the route to Net Zero Standard

We're thrilled to have achieved the Taking Action tier of the Carbon Trust Route to Net Zero Standard this year.

The standard is the only certification helping organisations around the world to measure and manage their emissions, inform carbon reduction strategies, and align targets for the future with tailored advice from trusted experts.

Achieving this certification demonstrates our ongoing commitment to reducing our carbon emissions.

We're leading the way in the energy industry as an early adopter of the new standard and have been named as a Pathfinder.

Reducing our business carbon footprint

We're currently on track to reduce our business carbon footprint in line with our reduction target for RIIO-GD2.

Our business carbon footprint encompasses our scope 1 and 2 emissions, excluding shrinkage. We have a target to reduce this by 25% by 2026.

Since our baseline year in 2019, we've reduced our business carbon footprint by almost 17% already.

Powering our sites with renewable energy

We're proudly providing 100% certified renewable electricity to 98.7% of our depots and offices. This is reducing our greenhouse gas emissions, calculated as market-based emissions (see page 22).

In addition, we'll install more direct-feed solar panels at our sites during RIIO-GD2 to provide renewable electricity directly to our occupied buildings.

Dashboard indicators

A quick look at our environmental performance through some key facts and figures.

Our performance at a glance

Environmental impact and KPI	2022/23 performance
Contribution to energy system decarbonisation	
Biomethane Annual addition of low carbon and renewable energy connected to the network	0 scm/h
Innovating for decarbonisation and to protect the environment	
Innovation investment Annual investment in ongoing innovation activities that are primarily supporting decarbonisation and/or protecting the environment	£2.6m
Climate change mitigation	
Carbon footprint excl. shrinkage Annual reduction in business carbon footprint excluding shrinkage	19,844 tCO_2e 7% reduction on last year
Carbon footprint excl. shrinkage Annual change in business carbon footprint excluding shrinkage in comparison to the end of RIIO-GD2 target	12% higher than our end of RIIO-GD2 target of 17,395 tCO_2e
Shrinkage emissions reduction Annual reduction in total shrinkage	696,634 tCO_2e 3% reduction on last year
Sustainable procurement	
Suppliers meeting sustainable procurement code Proportion of suppliers meeting the environmental supplier code or equivalent	85%

Environmental impact and KPI	2022/23 performance
Efficient resource use and circular economy	
Total waste produced Annual total waste (office, network, depots, construction)	242,241 tonnes
Waste Office and depot waste – recycled Office and depot waste – landfill	94% 1,304 tonnes 6% 80 tonnes
Waste Spoil waste – recycled Spoil waste – landfill	97% 221,520 tonnes 3% 6,851 tonnes
Local environment	
Investment in local environment Annual investment in schemes to enhance or restore local environmental quality	£230,172
Area with biodiversity improvement Land area being treated in schemes to enhance or restore local environmental quality	18,785m^2 1.9 hectares
Biodiversity studies Number of biodiversity baseline studies carried out at our sites	54
Biodiversity improvement Number of biodiversity projects carried out across our network areas	7
Biodiversity improvement Net change in biodiversity units from network development projects granted planning consent in the year that impacted the local environment	Figures not yet available
Environmental incidents Number of reportable environmental incidents with a risk of land or water pollution	Zero

Environmental commitments and impacts

We're committed to improving our environmental impacts and making our business more sustainable. We have a variety of initiatives already underway to make this a reality.

Environmental commitments

Initiative	Description	Target year	Implementation milestones	Progress	Status update
Climate change mitigation – reducing business carbon footprint					
Reduce emissions from company car business travel to reduce scope 1 emissions	Encourage the uptake of hybrid and zero emissions company cars, and reduce the allowance of gCO_2e/km for eligible company cars	2025/26	Maximum allowance of $95gCO_2/km$ average across company car fleet by 2026	🟢	We've reduced our current average to $58.6gCO_2/km$, down from $73gCO_2/km$ last year.
Transition to a zero emissions operational fleet to reduce scope 1 emissions	Transition our commercial fleet to 50% zero-emissions vehicles, where possible	2025/26	New EV vans planned to be added to our fleet: 2021/22: 25 2024/25: 579 2022/23: 0 2025/26: 753 2023/24: 0	🔴	We're experiencing global supply chain issues, as well as challenges around certain operational vehicles not being readily available on the EV market. We have 25 small electric vans in our fleet so far and hope to test some larger electric vans next year.
Install charging infrastructure to support a zero-emissions operational fleet to reduce scope 1 emissions	Install 355 EV charging points at our depots and offices	2025/26	New EV charging points planned to be installed: 2021/22: 59 2024/25: 50 2022/23: 72 2025/26: 80 2023/24: 94	🟡	Our installation programme has been delayed slightly this year while we engage a new installation partner, but we still anticipate we'll be able to meet our 2025/26 target.
Energy efficiency improvements to reduce scope 2 location-based emissions	1. Install building management systems at our large and medium-sized sites	2025/26	1. Produce tender specification 2. Tender and award install contract 3. Installation and delivery programme		Our programme was delayed this year due to supply and procurement issues. However, we still plan to equip 14 of our sites with building management systems by 2025/26.
	2. Install LED lighting	2025/26	1. Produce tender specification 2. Tender and award install contract 3. Installation and delivery programme	🟢	We currently have LED lighting installed at three sites within our Southern network. Despite delays to our delivery programme this year, we expect to complete the rollout in Q4 2023/24.
	3. Net zero mapping of our property portfolio	2023/24	1. Baseline 2. Determine actions for next-stage improvements in 2026-2031 to achieve net zero by 2045		Phase 1 is complete. This work is additional to the original commitments in our 2021-2026 business plan.
Procure 'green' electricity to reduce scope 2 market-based emissions	Purchase 100% certified renewable electricity	2021/22	Switch the remaining non-renewable tariffs to renewable contracts by 2026	🟡	We now purchase 100% certified renewable electricity for 98.7% of our consumption.

Progress indicator key:
- 🔴 Progress against milestones is at significant risk and highly likely to be missed
- 🟡 Progress is delayed but likely to be achievable before the end of the price control period
- 🟢 Progress against the implementation milestones is on track

Environmental commitments continued

Initiative	Description	Target year	Implementation milestones	Progress	Status update
Climate change mitigation – reducing business carbon footprint (continued)					
Renewable energy on selected occupied sites to reduce scope 2 location-based emissions	1. Install direct-feed solar PV	2023/24	1. Produce tender specification 2. Tender and award install contract 3. Installation and delivery programme	🟡	Our first direct-feed solar PV was installed at our Epsom depot in October 2022. We hope to install solar PV at five more sites in 2023/24.
	2. Install wind turbine at our Thurso Scottish Independent Undertaking (SIU) site	2023/24	1. Electrical/mechanical design appraisal and approval process 2. Build, install and connect the turbine		We aim to begin construction of the wind turbine in autumn 2023, subject to weather conditions.
Climate change mitigation – reducing carbon of products, projects and services					
Identify tools and methodology for measuring embodied carbon to reduce scope 3 emissions	Measure and eventually manage the embodied carbon of key projects (with a value of >£20m), products and materials	2025/26	Gather embodied carbon data from our H100 Fife project and new Horley head office	🟢	We prepared a first draft of an embodied carbon tool in 2022/23. We'll begin gathering embodied carbon data from our H100 Fife project in summer 2023 and from our new Horley head office during construction. We are finalising our embodied carbon tool in 2023/24.
		2025/26	Measure embodied carbon of key products and materials by spend	🟢	We are already capturing data relating to our PE pipe and reinstatement materials and aim to expand this to other key products and materials over RIIO-GD2.
		2025/26	Work collaboratively with industry and stakeholders to develop tools for measuring embodied carbon and share best practice	🟢	We're part of the Energy Networks Association (ENA) Gas Environment Group, currently fulfilling the role of Chair. We're participating in the TfL and HAUC(UK) Road to Net Zero project, developing a carbon tool for streetworks emissions.

Progress indicator key:
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Environmental commitments continued

Initiative	Description	Target year	Implementation milestones	Progress	Status update
Sustainable procurement					
Target 80% of suppliers (by spend) to meet the Sustainable Procurement Code	Engage with our supply chain to improve and apply best practice	2025/26	1. Baseline supplier performance from March until October 2022 2. Inclusion of some targets and KPIs, with reporting and monitoring in line with our roadmap from October 2022 until March 2026 3. Continuous improvement from April 2026	🟢	After issuing our Sustainable Procurement Code to all our suppliers, we're benchmarking the performance of our top 85% of suppliers by spend.
Set KPIs and improvement targets to improve supply chain performance	Establish relevant KPIs to improve environmental impacts in collaboration with our supply chain	2022/23		🟢	Reflecting our benchmarking exercise, we've developed initial targets and KPIs for supplier performance. With these in place, we're on track to gather increasingly more data from our suppliers over the coming years.
Efficient resource use and circular economy					
Embed principles of circular economy and measure the outcomes	Better understand what a circular economy means to our business in practice	2025/26	1. Circular economy review to be carried out in March 2022 2. Develop roadmap and action plans to improve during 2022/23 3. Establish relevant working groups in autumn 2023	🟡	We've completed the circular economy review. We'll develop a roadmap and action plan in 2023/24 to embed circular economy principles into our procurement practices.
Zero office and depot waste to landfill	Practice of waste hierarchy – to avoid waste, improve reuse and recycle	2025/26	2022/23: Identify key waste streams and regions for improvement Collaboration between key stakeholders to identify improvement opportunities	🟡	Our waste to landfill has increased over the last year, from 4% to 5.7%, due to several depot clear outs where due attention was not placed on our procedures. Although we're behind target we have developed an action plan to meet our target by the end of the price control. This includes collaborating with our waste management supplier to improve reuse and recycling, and engaging our people to change behaviours.
Zero avoidable waste to landfill across the business	Practice of waste hierarchy – to avoid waste, improve reuse and recycle	2025/26	Amended priority to focus on spoil, but we'll keep gathering data from across the business	🟢	We've improved our data gathering across the business. It showed that spoil is the most significant waste stream to consider when looking at zero waste to landfill. Our focus is now on spoil, while we are continuing to gather data from other areas.

Progress indicator key:
- 🔴 Progress against milestones is at significant risk and highly likely to be missed
- 🟡 Progress is delayed but likely to be achievable before the end of the price control period
- 🟢 Progress against the implementation milestones is on track

Environmental commitments continued

Initiative	Description	Target year	Implementation milestones	Progress	Status update
Efficient resource use and circular economy (continued)					
Reduce the use of virgin aggregate	Reduce the use of finite resources	2025/26	Establish a working group for improving reinstatement		The working group is improving data collection to ensure we're focusing on the right improvement actions eg industry collaboration and local authority engagement on the benefits of using recycled materials and innovative solutions to provide recycled materials.
Install solar PV on governor sites	Replace single-use battery packs with solar power systems to reduce hazardous waste as appropriate	2025/26	First 20 pilot projects in the Scotland network to be deployed in 2022/23		The project is delayed, but we're still aiming to install up to 50 units on a trial during RIIO-GD2.
Maintain ISO 14001 accreditation	Maintain our Environmental Management System to an accredited standard	Ongoing	Annual surveillance audits and three-yearly recertification		Four minor weaknesses were identified at June 2023 surveillance audit. Next recertification is due in summer 2024.
Local environment					
No net biodiversity loss	Perform biodiversity surveys and implement improvement activities to target biodiversity net gain	2025/26	Spring to autumn 2022: Pilot projects Spring to autumn 2022: Phase 1 biodiversity surveys Spring to autumn 2023: Phase 2 biodiversity surveys 2022 to 2026: Improvement works		We're on track with our phase 2 biodiversity surveys, having carried out 54 studies this year. We've also completed improvement works at seven sites.
Climate change adaptation	Identify and procure climate change mapping datasets to assess sites and identify action	2025/26	1. Procure and implement data sets 2. Assess sites		We've procured climate change mapping data sets this year and begun assessments of climate risk at our offices and on our network.

Progress indicator key:
- Progress against milestones is at significant risk and highly likely to be missed
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Contribution to energy system decarbonisation

Decarbonising the energy system means reducing the reliance on natural gas, which is a fossil fuel, and supporting the transition to low and zero-carbon green gases such as biomethane and hydrogen.

Central heating is responsible for up to a third of the UK's greenhouse gas emissions. If we're going to meet net zero targets, decarbonising home heating is one of the biggest challenges we'll need to tackle.

Our vision is to lead the way in low-carbon energy delivery by making gas green. We strongly believe that decarbonising the gas networks, predominantly through the adoption of hydrogen in place of natural gas, can play a vital role in helping meet the UK net zero targets.

Biomethane

Biomethane is a naturally occurring and renewable gas produced when organic material – such as food waste, cattle manure, sewage or energy crops – is broken down anaerobically. It can be used for heating and cooking just like natural gas.

We're committed to increasing the volume of biomethane in our network to reduce carbon emissions and provide a sustainable, renewable energy source as we move towards net zero.

We have set ourselves an ambition of providing sufficient network capacity at connected biomethane plants to supply 450,000 homes with biomethane by 2026.

We're already in a strong position to meet our 2026 target, having connected sufficient biomethane capacity to supply 259,000 homes with biomethane by the end of March 2023.

2022/23 biomethane activity summary

Biomethane connections	Unit	2022/23 Scotland	2022/23 Southern
Enquiries	Count	52	66
Connection studies	Count	12	8
Capacity of connection studies	Scm/h	20,700	15,370
Connections	Count	0	0
Capacity connected	Scm/h	0	0
Volume (energy value) of biomethane injected	kWh	0	0
Average monthly flow rate (all connections)	Scm/h	706	460

Biomethane plants such as this one at Coupar Angus in Perth will be key to decarbonising our network.

New biomethane connections

While there were no new biomethane connections to our Scotland or Southern networks this year, we're working closely with project developers to deliver a further 17 sites across our footprint which would see us meet our ambition of supplying 450,000 homes with biomethane by the end of RIIO-GD2.

We're extremely proud of the integral part we've played in the development of biomethane as a viable energy resource over the past 13 years.

We already have 35 plants connected and injected biomethane into our network. We also have several sites that were mothballed and are now in the process of being refurbished, ready for recommissioning.

Connection studies

We measure biomethane capacity in scm/h, which is the flow rate of a standard cubic metre of gas per hour. The capacity of connection studies we've carried out this year exceeds 35,000scm/h. The requested injection rates vary from 100scm/h to 6,300scm/h.

We have progressed some of these studies to connection agreements. These projects will be commissioned over the next three years, depending on the size of the project.

Some customers are requesting multiple Network Entry Facilities at the same location. Customers requesting these studies vary by size, from large industrial users to smaller private businesses.

Future plans

We've been contacted by a number of our existing biomethane sites about their plans to increase biomethane injection rates and improve their overall contribution of green gas flowing into our network.

Some biomethane producers are looking to increase the injection rate of individual sites by upgrading their current gas entry facilities and equipment.

Meanwhile other sites, such as some of those located in Scotland, are planning to increase their injection rates by constructing additional network entry facilities adjacent to existing sites. The potential expansions at these sites will put them on course to become some of the largest biomethane plants in the world.

We're engaging with some of our connected biomethane sites that are looking to innovate and improve their facilities by capturing carbon dioxide instead of releasing it into the atmosphere.

During the biomethane production process, carbon dioxide is removed from the biogas. By capturing and storing the removed carbon dioxide, it can be used for practical purposes, for example in the food and drink industry. The addition of carbon dioxide capture would result in many sites becoming carbon negative, while also increasing the attractiveness of clean energy certificates.

In addition, many of our biomethane sites are very interested in gas blending and propane reduction. This would reduce the amount of propane required to be added to biomethane to reach gas energy regulation requirements. Although this is something that's still being worked on logistically, it would result in significant reductions in both cost and total carbon output, placing us very well on track to meet our net zero targets.

Contribution to energy system decarbonisation continued

Hydrogen

Hydrogen is a clean burning alternative to fossil fuels, which could be used across energy sectors including heat, industry power and transport. Green hydrogen can be created using clean energy, like wind power, meaning there are no harmful carbon emissions involved.

We're working alongside Britain's other gas networks and the UK and Scottish Governments to look into how we can repurpose our network to deliver hydrogen instead of natural gas. Together, we're building an evidence base for hydrogen which could shape the way we heat our homes in the future alongside other renewable technologies.

Key projects

H100 Fife

We've reached a major milestone in our H100 Fife project this year. Our world-first hydrogen-to-homes demonstration project will bring renewable hydrogen into Fife homes in 2024, providing zero-carbon fuel for heating and cooking. In March 2023, we marked the beginning of construction of our hydrogen homes demonstration facility, where visitors will be able to try out domestic hydrogen appliances.

You can read more about our project progress over the past year in our H100 Fife case study.

LTS Futures

As part of the National Hydrogen Programme, we've secured £29.9 million of funding for our LTS Futures project. Through this project, we'll use a decommissioned pipeline that runs from Grangemouth to Edinburgh to test and evidence whether high pressure pipelines can be adapted for hydrogen transmission and storage as an option for net zero.

Grangemouth is one of Britain's largest industrial clusters and could be a key location for hydrogen production. The pipeline is statistically representative of Britain's local transmission system (LTS), so will provide the blueprint for repurposing all the high-pressure pipelines across the country.

Read more about LTS Futures on our website

Scotland water study

In its draft Hydrogen Action Plan, the Scottish Government set the ambition of achieving 25GW of low-carbon hydrogen capacity by 2045. Producing that level of hydrogen requires significant volumes of water.

We commissioned global engineering, architecture and consultancy company Ramboll to conduct a technical assessment and feasibility study into water supply requirements for hydrogen production in Scotland. The research revealed Scotland has sufficient water to meet the Scottish Government's 2045 target and has the potential to become a world leader in hydrogen production.

Our study determined that enough water resources exist in all key regions where hydrogen production is expected. Treated effluent is expected to be the main water source, positively impacting the environment and reducing demands on other water sources.

The Solent Cluster

Meanwhile in our Southern network, we've joined The Solent Cluster, the first major decarbonisation initiative to substantially reduce carbon emissions from industry, transport and households across the Solent and the south coast of England.

Our membership of The Solent Cluster follows on from our Southampton Water feasibility study, which investigated hydrogen production in the area to decarbonise emission-intense sectors like heavy industry, transport and heating.

H2 Connect and H2 Caledonia

Since our Southampton Water feasibility study in 2020, we're now working to deliver a pre-FEED (Front End Engineering Design) study – our H2 Connect project – for a 100% hydrogen pipeline to transport locally sourced clean energy to 800,000 nearby homes and businesses.

We're also carrying out a further two pre-FEED studies in Scotland, as part of our H2 Caledonia project, to determine the route and design of hydrogen transmission infrastructure to support our wider ambition to decarbonise the energy we transport in our pipes.

We're developing a world-first hydrogen network in Buckhaven and Denbeath that will bring renewable hydrogen into homes in 2024.

Our pre-FEED studies will also explore how existing networks can support the development of the Scottish and Solent Clusters, as well as the likely cost and timescales of any new infrastructure required.

Both our H2 Connect and H2 Caledonia projects will connect to the national transmission system operated by National Gas Transmission and work alongside its Project Union, a pioneering project to create a UK hydrogen backbone, transporting 100% hydrogen and connecting production and storage facilities with end users.

Wider industry collaboration and engagement

Capital Hydrogen

In April 2022, we announced our pioneering Capital Hydrogen partnership with Cadent and National Grid Gas Transmission. The first stage was a feasibility study which identified that London would need at least 40TWh of hydrogen to decarbonise heating, transport and power generation by 2050.

This study informed the development of our hydrogen vision for the capital. Launched at the House of Commons in October 2022, the vision set out the potential benefits and opportunities of hydrogen for the region, including reducing emissions, boosting energy independence and generating jobs.

Pupils from Levenmouth Academy visited our demo kitchen at the Fife Renewables Innovation Centre in January 2023.

Gas Goes Green

As part of the Gas Goes Green programme with all Britain's gas networks, we've been working to update our hydrogen vision for the UK. Leading up to the publication of the report in April 2023, we worked with the other gas networks to develop a series of maps that depict a plausible vision for the rollout of hydrogen in five-year increments and the infrastructure needed to support it.

Read more about Gas Goes Green on our website

Local authorities and UK Government

We're actively engaging with stakeholders from local authorities, potential hydrogen producers and users of hydrogen around our key hydrogen projects. As local authorities are developing their plans to meet net zero, it's important we're sharing our hydrogen plans and project progress to help shape their strategies.

We also continue to work closely with the Department for Energy Security and Net Zero (DESNZ), formerly BEIS, around the range of hydrogen projects we're undertaking that are delivering the evidence to UK Government on the vital role of hydrogen in meeting its net zero targets.

Contribution to energy system decarbonisation continued

Repurposing the network for hydrogen
Fife Council representatives join our CEO Mark Wild and H100 Fife Project Director David Ross to mark the start of construction of our new hydrogen demonstration facility.

Case study: Green hydrogen

Our pioneering H100 Fife project will be the first 100% green hydrogen-to-homes network in the world, providing important evidence to help the UK decarbonise home heating.

At the forefront of the clean energy revolution, our H100 Fife project will bring 100% green hydrogen gas to homes for the first time.

Currently, heating accounts for about 37% of all UK carbon emissions. Investing in a practical, scalable zero-carbon solution, like hydrogen, can help cut emissions by over a third.

Marking major milestones

We celebrated a major project milestone in March 2023, when we officially started construction of our hydrogen demonstration facility in Fife Energy Park.

The demonstration facility will have two hydrogen homes where visitors, including residents who will participate in the trial, can try out domestic hydrogen appliances. We'll begin welcoming visitors later this year.

Our hydrogen network will be going live in 2024 and will heat around 300 local homes using clean green hydrogen produced by a dedicated electrolysis plant, powered by a nearby offshore wind turbine.

Environmental impacts continued

Innovating for decarbonisation and to protect the environment

In driving our operational and network emissions down to net zero, we need to deploy established technologies like electric vehicles and solar panels. We also have to tackle some harder-to-abate emissions from our network, including methane emissions, and this is where innovation comes in.

We can also apply innovative solutions to the way we use resources, which can help to keep valuable and potentially limited resources in use for longer and avoid sending waste to landfill. We have invested £2.6 million this year in developing transformational innovation projects that support our ambition to decarbonise our network and improve our impact on the environment. In the following table, we've shared news of our new projects as well as provided an update on our ongoing projects from last year's report.

This year, we've doubled our number of decarbonisation and environmental protection projects from five to ten.

Innovation	Issue	Solution	Expected environmental benefits	Status update
Stent bag	Methane leakage into the atmosphere from high-volume gas escapes.	With world-first stent bag technology, we're able to insert a bag into the pipe and inflate it to stop any leaks – all while still allowing gas to flow through the pipe.	Reducing the quantity of methane emissions when managing high-volume gas escapes.	We've completed our field trials and have deployed our four kits on five jobs on our live network, significantly reducing methane emissions when managing gas escapes.
High volume gas escape toolbox	Methane leakage into the atmosphere from high-volume gas escapes.	Our high volume gas escape toolbox comprises of a range of tools that can seal high-volume gas escapes with improved efficiency. These include: • **Bung** tools are used on circular hole leaks where a fitting or pipe has been removed or sheared off the parent main, or a pipe has been severed leaving an open end. • **Bosie** is a tool used to deploy a bespoke temporary wraparound repair clamp type fitting and can be used on pipe fractures or irregular failures to the parent main that are not circular in size, and therefore unsuitable for the Bung tooling. • **Frog** tool can be used where the failure size is within parameters, the pipe wall integrity is thought to be sufficient, and the pipe is not fully excavated.	Reducing the quantity of methane emissions when managing high-volume gas escapes.	The initial batch of six toolbox kits has been manufactured and we've begun training our teams.
Reusable coupler, elbow and purge end fittings	Used polyethylene (PE) fittings are sent as scrap waste for recycling.	Fittings can be reused up to 40 times.	Reducing PE scrap sent for recycling.	We've completed the rollout of these fittings, reducing the volumes of used fittings being sent to scrap.
CISBOT	Methane leakage into the atmosphere from mechanical joints on large-diameter cast iron gas mains.	We've further developed our RIIO-GD1 technology to repair mechanical joints in addition to lead yarn joints.	Reducing leakage emissions.	We trialled using CISBOT to seal 58 mechanical joints on pipes across our networks. The robotic system was able to travel through the pipe sealing the joints with minimal excavation and traffic disruption. Following successful trials, we've now approved the use of CISBOT for mechanical joint repairs.

Environmental impacts continued

Innovating for decarbonisation and to protect the environment continued

Innovation	Issue	Solution	Expected environmental benefits	Status update
Infinity bypass	Used plastic pipe and fittings required to ensure safe operations are sent to waste or to be recycled.	We've developed a reusable bypass that reduces the amount of PE required for routine operations in mains replacement.	Reducing PE scrap sent for recycling.	We've completed the rollout of 15 infinity bypass kits and it's being used by teams across the business.
Core and Vac Mark 2	Traditional excavation methods with large excavations result in considerable amounts of waste being sent to landfill or for recycling.	Our improved Core and Vac vehicle eliminates the need for large excavations by removing a small section of road – the core – to repair the gas pipe from above ground with long-handled tools.	Eliminating the need for large excavations reduces the amount of excavated material sent to landfill or recycling plants, as well as virgin or recycled backfill material.	We've completed more than 80 repairs with our Core and Vac Mark 2 vehicle and we're planning to add more vehicles to our fleet. We've been able to minimise disruption in traffic-sensitive areas by using this technology to carry out repairs overnight.
Vacuum excavator	Traditional excavation methods result in considerable amounts of waste being sent to landfill or for recycling.	With the vacuum excavator providing a soft touch approach to digging, we're able to reuse the material while also improving safety performance.	Improving operational efficiency, reducing time on site and reducing the amount of excavated material sent to landfill or recycling plants.	With the addition of new vacuum excavators, we've increased the use of this technology across our networks.
Remote pressure management	Manually managing the pressure in our governors results in callouts and site visits to balance security of supply while minimising leakage.	We've developed a remote pressure management system that allows us to maintain low pressures in our network without jeopardising the safety or security of supply. Lower pressures means lower leakage.	Reducing leakage emissions through smarter, more efficient network control and management.	We've used the new system at 50 trial sites across our Southern network with a further 650 sites planned.
Remote stub end abandonment solutions	Traditional excavation methods result in considerable amounts of waste being sent to landfill or for recycling. Stub ends are found in traffic sensitive areas where excavating over the top of the pipe would cause significant social costs with traffic management required.	ESEAL and FBOS are remote foam methods that replace stub end abandonment solutions for short lengths of metallic mains. Less excavation is required and this can be carried out remotely away from busy main roads.	Reducing the amount of excavated material sent to landfill or recycling plants, plus reducing idling vehicles.	Building on the success from the development within Northern Gas Networks, this product has been used over 40 times and is available for our teams through our supplier Steve Vick.
Robotics Roadworks and Excavation System (RRES)	All utility companies face ongoing challenges of how to safely and efficiently manage excavation activities.	RRES uses advanced robotic technology and AI to reduce the required excavation size, labour costs and equipment while making the work safer.	Compared to traditional excavation methods, RRES will have a much smaller physical and carbon footprint. Not only will this reduce our carbon dioxide emissions, but also reduce delays for road users and pedestrians.	We've successfully completed trials where RRES carried out the full end-to-end operations from excavation to reinstatement. The next steps are to determine the implementation pathway for RRES and its stripped out technology.

Innovating for decarbonisation and to protect the environment continued

Above-ground repairs
With the core removed, our engineers use long-handled tools to repair our pipe.

Case study: New technology

Our improved Core and Vac vehicle is reducing emissions from our operations, as well as reducing our waste to landfill.

Using our innovative core and vacuum technology eliminates the need for large excavations and speeds up reinstatement. We're able to remove a small section of the road – the core – and repair our pipes from above ground with long-handled tools.

Reducing waste to landfill

Typically, we require large excavations to allow our engineers to safely access our pipes. We need to dispose of the excavated material from these excavations, as well as backfill the site once we've completed our work.

By just removing a core from the road instead of digging a long trench, we're dramatically reducing the amount of excavated material generated by these sites.

Our second-generation Core and Vac vehicles use more efficient vacuum technology allowing for more of the excavated materials to be reused when it comes to reinstatement. This reduces the amount of new soil and tarmac we need to restore the road surface.

Reducing emissions

Smaller excavations mean less excavated materials being transported away from our sites. Plus less virgin aggregate needs to be delivered as we're able to reuse more of the excavated materials.

With fewer heavy vehicles travelling to and from sites, the Core and Vac system is also reducing vehicle emissions related to our repair operations.

Environmental impacts continued

Climate change mitigation

We have set ourselves the target of reaching net zero emissions by 2045. This is our long-term greenhouse gas reduction target, aligned with the science-based methodology of the Paris Agreement.

We will achieve this across our direct emissions (scope 1), energy that we purchase from others (scope 2) and indirect emissions from our supply chain (scope 3).

Shrinkage

As a gas distribution network company, our carbon footprint is largely driven by the natural gas that is transported through our network.

The biggest contribution to our organisational carbon emissions by far is shrinkage. This includes leakage from our network (so called fugitive emissions), theft of gas and our own gas use. Shrinkage is a scope 1 emission and included in our net zero target for 2045.

In total across both our networks, our annual leakage was 696,634 tCO_2e.

This is a reduction of more than 9% compared to baseline year 2019, and a reduction of 3% compared to last year.

You can find a detailed breakdown of our leakage volumes by source, and by network, in the report appendix.

While we have not set any formal targets for reducing the environmental emissions from shrinkage and there's no Ofgem requirement to do so, we're looking at mapping the shrinkage reduction required to meet net zero by 2045 and to be aligned with the Paris Agreement on climate change.

Currently, we compare our emissions to what we forecasted at the beginning of this price control period. We are working towards forecasted emissions reductions which would see us reducing shrinkage by approximately 18% over RIIO-GD2.

In 2022/23, we underperformed slightly in our Southern network and overperformed in Scotland.

This leaves us overall slightly down on forecasted shrinkage for the period. We are aiming to claw back the deficit by the end of the price control, so the aim is to finish RIIO-GD2 on target to meet our pre-GD2 forecasts.

We've reduced shrinkage by 3% this year compared to last year, primarily through our mains replacement programme.

We're replacing old iron gas mains with new plastic pipes to ensure homes and businesses continue to receive a safe and reliable gas supply into the future. As well as the safety benefits of our network upgrade programme, it also ensures our network is ready for the transition from natural gas to hydrogen.

Our replacement programme is the biggest lever we can pull to reduce shrinkage. How much we do in any given year is reliant on Ofgem allowances.

Another key initiative contributing significantly towards reducing shrinkage is our remote pressure control and management system Utonomy. This innovative new system enables us to remotely and continuously adjust the pressure in our network to match real-time demand.

While historically we've had to manually adjust the pressures approximately four times a year, demand varies daily and even hourly. By automating this process, we're able to optimise the pressure in our network. Reducing excess pressure in our network results in lower leakage levels and fewer emissions.

Scope 1 and 2 emissions excluding shrinkage

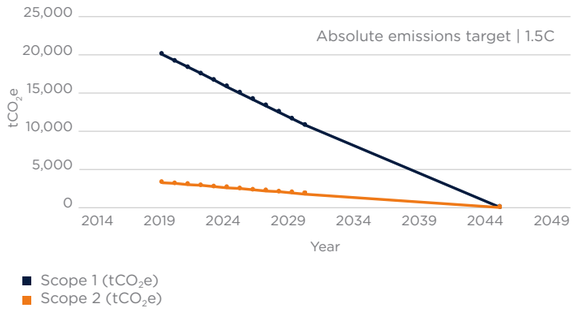
To achieve net zero emissions by 2045, we have determined our scope 1 and 2 emissions flight path. Not only will this ensure we meet our 2045 target, but it also ensures we are on track with the Paris Agreement goal of limiting global warming to 1.5°C.

By the end of RIIO-GD2 in 2026, we will reduce our business carbon footprint scope 1 and 2 emissions (excluding shrinkage) by 25% compared to our 2019/20 baseline.

As we improve our scope 3 reporting in the years to come, we intend to include these emissions in our net zero trajectory too.

Our flight path has been developed in collaboration with the Carbon Trust and is aligned to the Paris Agreement.

Net zero trajectory for scope 1 and 2 excluding shrinkage



We're proud to report that we're currently on track to achieve our 25% reduction target for scope 1 and scope 2 emissions by 2025/26.

Over the following pages, we explain our progress in reducing our scope 1 and 2 emissions this year. You can also find more in-depth emissions data within the report appendix.

Building energy use

The total carbon emissions from our building energy use have reduced from 8,559 tCO_2e in 2021/22 to 5,765 tCO_2e this year.

We measure emissions from our building energy use in two ways: market-based emissions and location-based emissions.

Market-based emissions are the emissions associated with any green or renewable energy tariffs we buy from our suppliers. We have actively chosen to buy certified renewable energy from our electricity supplier. We purchase 100% certified renewable electricity for 98.7% of our consumption. We are working to transfer the remaining tariffs over to a renewable tariff where possible.

However, as it cannot be guaranteed that the energy delivered to our depots and office is green or renewable, location-based emissions reflect the average emissions of the electricity available on the grid. We can reduce our location-based emissions by installing solar panels and other direct feed renewables on our sites.

Our location-based scope 2 emissions have reduced as a result of decreased gas consumption related to our turbo expander at our St Mary Cray depot.

The turbo expander uses the normal operation of our gas network to generate electricity. When high pressure gas from our network passes through the turbo expander turbine, the pressure reduces. As a result, the volume of gas expands through the turbine which spins a generator to produce electricity. This electricity is used at our St Mary Cray depot and any surplus is sold to the grid.

This year, our turbo expander has not been operational while we've carried out planned maintenance. The reduction in gas consumption from our turbo expander not operating is so considerable that overall our emissions from building energy use have reduced by 22% this year.

Once the maintenance is complete, our turbo expander will come back online. With this, we expect our gas consumption to increase next year to nearer our 2021/22 levels.

We're committed to reducing the carbon footprint of our building energy use to contribute towards mitigating climate change. We've developed a number of programmes designed to improve our energy use at our depots and offices.

Renewable energy

We've begun a programme to install direct feed solar photovoltaics (PV) panels on 15 of our key occupied sites. This is in keeping with our refocused strategy, which targets sites that consume the most energy and where we can make the greatest impact in reducing energy usage through larger solar PV installations.

Before we can install solar panels at our sites, we must first carry out structural roof assessments and obtain planning permission. We initiated this process for four sites this year, completing installation at our first site in Epsom in October 2022.

Climate change mitigation continued

Mains replacement programme
We're replacing our old metal gas pipes with new plastic PE, reducing methane released into the atmosphere.

Case study: Reducing shrinkage

With leakage making up 95% of our carbon footprint, minimising how much gas is lost from our network is essential for us to achieve our net zero targets.

We're investing in initiatives to help prevent gas escaping from our network, with the aim of reducing shrinkage by approximately 18% over RIIO-GD2.

Mains replacement

Our mains replacement programme sees us replace old iron gas mains with modern plastic pipes. This Ofgem-approved programme is the key intervention we can make to reduce leakage.

We've replaced 831km of gas mains this year, which has contributed towards our shrinkage emissions reduction of approximately 24,800 tCO_2e.

By implementing innovative new technologies as we upgrade our network, such as CISBOT and Core and Vac, we're also able to reduce the carbon emissions of our operations.

Pressure management

Reducing gas pressure in the network can reduce leakage. However, we need to balance reducing pressures with safely maintaining customer supplies. Effective pressure management can contribute towards minimising our carbon footprint.

Our new remote pressure control and management system Utonomy is one initiative that is already contributing significantly towards reducing shrinkage.

With funding from Ofgem's Strategic Innovation Fund (SIF), we're able to expand this technology through our Intelligent Gas Grid project. This project seeks to combine AI and data digitalisation to automate network pressure control, reducing leakage and associated carbon emissions.

Environmental impacts continued

Climate change mitigation continued

We'll complete the installation at three more sites in our Southern network in summer 2023 and we also hope to install solar PV panels at our first two Scotland depots by the end of March 2024. We've tendered and awarded a PV installation framework to a partner for the planning and installation of our projects to speed up the delivery of our installation programme.

You can read more about the first of our solar PV projects in our Epsom solar PV project case study.

Building management systems

We plan to equip 14 of our medium and large occupied sites with building management systems by 2025/26. The systems will optimise the way we use heating and cooling, making it more efficient and saving energy.

We're working with a controls specialist to ensure the specification for our building management systems is future-proofed beyond this price control into RIIO-GD3.

We had hoped to complete the installation of nine systems this year, however, our programme has been delayed while we work with our controls specialist to secure an appropriate cloud-based system that will be fit for purpose for the long term.

The first site we'll be prioritising for installation is our Walton Park site, near Portsmouth, which is our highest energy-consuming office.

LED installation

We have LED lighting installed at three sites within our Southern network. Through benchmarking baseline usage this year and comparing it to sites without LED lighting, we will be able to evaluate the energy savings of this initiative.

We've experienced procurement issues, which have impacted our delivery programme this year. We've adjusted our installation programme accordingly and now plan begin rollout in August 2023, with the full delivery programme expected to be completed in Q4 2023/24.

Our LED lighting delivery programme is closely aligned with our wider property strategy. We're reviewing the condition of all our sites across our portfolio and ensuring that our LED installations are scheduled as part of any site refurbishments to maximise efficiencies and minimise disruption to our colleagues.

Thurso wind turbine

We have limited opportunities to improve building energy use at our Scottish Independent Undertaking (SIU sites), because of their operational status and safety constraints. Our Thurso wind turbine is an exciting opportunity to understand how we could reduce the environmental impact at our SIU sites.

We will be installing a small 6kW wind turbo at our Thurso site with the aim of reducing our energy usage by 20%. We hope to begin construction in autumn 2023, subject to weather conditions, with the wind turbine operational from early 2024.

New head office in Horley

Construction of our new headquarters in Horley is well underway, having started in August 2022.

The building has been designed to achieve a BREEAM rating of 'Excellent' for energy-efficient measures, exceeding our planning requirement to target a 'Very Good' rating. BREEAM is the world's leading science-based assessment for building sustainability.

The building will have a fully integrated solar PV system on the roof and solar shading on the windows to reduce solar gain. Underneath the car park, there will be a full urban drainage system with retention system. We're also allocating sections of the site for biodiversity schemes.

We're due to complete the construction of the building shell and core in October 2023. Meanwhile, the tendering for the design and build of the internal fit-out will take place over summer 2023 and we'll award the contract in November 2023. The target occupation date for our new Surrey head office is autumn 2024.

Net zero mapping

We continue to engage with energy management and carbon reduction experts WSP to perform net zero mapping of our building energy usage. This work helps us benchmark our delivered projects to validate that we're achieving the required reductions, as well as identify new initiatives to help achieve future reduction targets.

We're working with WSP to not only validate the installations we'll be doing in RIIO-GD2 and how these contribute towards reducing our building energy usage in the years to come, but we're also working with WSP to help shape our programme for the next price control period.

We're looking to WSP to advise on recommended technological interventions for RIIO-GD3, ensuring we're considering any emerging technologies or innovations as part of our future strategy.

Energy manager apprenticeship

We identified an opportunity to introduce a new junior energy manager apprentice role, which will encompass both energy management and carbon reduction.

This new two-year programme was approved in spring 2023 and we'll appoint the successful candidate in autumn 2023.

Operational transport

Commercial fleet

We're aiming to transition up to 50% of our commercial fleet to zero emissions vehicles by the end of the current regulatory price control in 2026. However, we've continued to face numerous challenges in progressing towards this target and have been unable to add any new zero emissions vehicles to our fleet this year.

We have specific operational and safety requirements for our vans and other commercial vehicles. For example, the vehicles must be able to safely store and transport our equipment and tools, have sufficient power offtake to operate these tools, and be able to spend undetermined periods carrying out emergency work. In the majority of cases, we need to acquire bespoke specification vehicles to enable us to operate efficiently and effectively.

However, we're limited by the general availability of zero emissions vehicles that meet our operational requirements, particularly 4x4s and large vans. These vehicle types are not currently available in the market to the specification we need.

To date, we've purchased 25 small electric vans and we hope to test and evaluate some larger electric vans during 2023.

While these vehicles will help us progress towards our 50% target by 2026, we're aware that our ambition remains at risk without the availability of operationally-suitable vehicles in the market. We're continuing to speak to manufacturers to stay fully briefed on the latest developments and future opportunities to trial new vehicles, including hydrogen and biofuel vehicles.

We're continuing to proactively engage with industry and manufacturers regarding the development of hydrogen vehicles and supporting infrastructure, and we're also in the early stages of speaking with industry about the feasibility of using other sustainable fuels.

Charging points

We're aiming to install 355 electric vehicle charging points at our depots and offices during this price control period.

Our installation programme has been delayed slightly this year while we engage a new installation partner, but we still anticipate we'll be able to meet our 2025/26 target.

Our electric vehicle drivers are able to benefit from EV charging cards, which provide access to more than 6,000 charging points across the UK. We're also continuing to explore home charging options.

Company cars

We've added a further 91 fully electric and hybrid company cars to our fleet this year, taking the total number of zero or low emission company cars to 452. This is equal to 75% of our company car fleet.

As a result, we've reduced the average emissions level of our company fleet from 73gCO_2/km to 58.6gCO_2/km.

In our Environment Action Plan submitted to Ofgem in 2019, we set out to reduce the emissions level by 5gCO_2 every year to a maximum allowance of 95gCO_2/km by 2026.

We exceeded that target in the first year of this price control and our improved average emissions level this year further improves our already-strong performance.

Climate change mitigation continued

Scope 3 emissions

Our scope 3 emissions include all indirect emissions not produced by us or our assets. These emissions are produced by the products and services we buy and use through our supply chain, as well as other indirect emissions including business travel and waste in our operations.

Unlike our scope 1 and 2 data, our scope 3 data has not been independently assured but we want to share what we are doing within this report and how we are working towards improving both our scope 3 emissions performance and our data gathering.

Approximately 50% of our scope 3 emissions are generated from purchased goods and services. In 2022/23, we identified this as circa 4,000 tCO_2e. As we further improve our scope 3 data gathering over the coming years, we expect this to increase.

Capital goods represent approximately 30% of our scope 3 emissions. This year, data from our PE pipe supplier shows emissions of circa 10,250 tCO_2e. We will work with additional suppliers during RIIO-GD2 to gather more data where possible. As such, we're expecting emissions in the category to also increase.

Scope 3 improvement programme

We're taking considerable steps to improve our scope 3 data through extensive engagement with our supply chain. This is an ongoing journey that will continue throughout this price control period.

It's a challenging task to capture, measure and report on scope 3 greenhouse gas emissions data. However, we've made progress in improving our data collection this year.

We've worked with our travel provider to gather data for car hire, as well as reporting on energy usage on shared sites with SSE and helicopter pipeline survey data.

We currently have 25 small electric vans in our fleet and plan to add more in the years to come.

With improvements in our data capture process during 2022/23, we have greater confidence in the scope 3 data we're capturing and monitoring this year.

We have used a spend-based method to calculate overall scope 3 carbon emissions. The method takes the cost of a purchased good or service and multiples it by a corresponding emission factor to estimate greenhouse gas emissions.

Using this method, our total scope 3 emissions for 2022/23 are estimated to be 169,000 tonnes of carbon.

You can find a full breakdown of the scope 3 emissions we've directly captured this year within the emissions data in our appendix.

We're installing 355 charging points during RIIO-GD2 and providing electric vehicle drivers with an EV charging card, with access to over 6,000 charging points across the UK.

Business travel

Our business travel emissions in 2022/23 were 709 tCO_2e. This is a 41% increase on last year, but a 38% reduction compared to pre-pandemic levels in 2019/20 when our business travel emissions were 1,145 tCO_2e.

While the pandemic forced behavioural change around replacing in-person meetings and workshops with virtual equivalents, our business continues to embrace these methods for the benefits they have on our business travel emissions as well as employee efficiency and wellbeing.

Embodied carbon

Embodied carbon is defined as the total greenhouse emissions generated to produce an asset or a product. This includes emissions caused by the extraction, manufacturing, processing, transportation and assembly of every product and element used in building the asset.

We have committed to reporting on the embodied carbon of any construction project costing at least £20 million.

We currently have two projects of this scale in the pipeline, our new Horley headquarters and our H100 Fife hydrogen network demonstration project.

Our new Horley head office in Surrey will open in 2024, designed to achieve a BREEAM rating of 'Excellent' for energy-efficient measures.

We've begun construction of our new head office in Horley, Surrey. The building is due to open in autumn 2024 and we'll collect embodied carbon data associated with this project during construction.

We've also started a project to report on embodied carbon of our H100 Fife project, with a new dedicated resource joining us to gather and monitor this data.

Industry collaboration

We're collaborating with industry and stakeholders to develop tools and methodologies for reporting on embodied carbon, as well as sharing best practice on climate change mitigation.

We're part of the HAUC(UK) and Transport for London (TfL) Road to Net Zero project, which seeks to assess the impact, scope and opportunities to reduce the impact of roadworks on climate change. As part of the steering group, our focus for the first phase of this project – the discovery phase – has been to provide input on carbon emissions to support scoping the carbon tool which is being developed for streetworks.

Climate change mitigation continued

Solar power at Epsom
We're installing photovoltaic (PV) cells at our sites to help reduce our CO_2 emissions.

Case study: Solar panels

Our Epsom depot in Surrey is home to our first solar PV panel system with the site benefiting from a huge 62% daily average reduction in carbon dioxide emissions.

Installing solar panels at our depots and offices reduces our reliance on electricity from the grid, reduces our carbon emissions and reduces the amount of power we buy.

We've installed 153 photovoltaic (PV) cells on the roof of our Epsom depot. These solar panels have a combined generation output of 70.38 kWp.

Radically reducing grid reliance

Before the installation, our Epsom depot used 5,775 kWh of electricity from the grid over 28 days. After the installation, our grid usage reduced to 2,677 kWh over the same time period.

Installing the solar PV system resulted in us reducing our electricity consumption purchase from the grid by almost 62% and reduced our carbon dioxide emissions by the same amount.

These figures well exceed our target of a 40% reduction in grid consumption and emissions.

Driving down CO_2 emissions

To put it into perspective, the CO_2 saving we're achieving from our Epsom solar panels every day is the same amount of emissions that would be released if you drove a passenger car for 667km – that's about the same as driving from London to Winchester.

While Epsom is the first of our depots to see new solar panels installed, we'll be installing solar panels at most of our occupied depots and offices by 2025.

Environmental impacts continued

Sustainable procurement

With 46% of our carbon footprint (excluding shrinkage) attributed to our suppliers, it's vital we engage with our supply chain on our transition to net zero.

As indirect emissions from our value chain make up our scope 3 emissions data, we rely on our supply chain, and the data provided by these partners, to enable us to fully report on our greenhouse gas emissions.

We are working with our supply chain partners to improve the environmental impacts of the products and services they provide to us, while enabling strong relationships with our partners.

Sustainable Procurement Code

We've developed our Sustainable Procurement Code to enable our supply chain partners, including contractors, service providers and suppliers, to understand our plans to integrate Environmental, Social and Governance (ESG) themes into our procurement practices. This includes working with our supply chain to assess, monitor and establish a baseline of embodied carbon in purchased goods, and ultimately establish targets for improvements.

The code also explains the sustainable procurement metrics we want our suppliers to begin to report to us. While it's not currently mandatory for our suppliers to report their ESG performance to us, we've set a target of at least 80% of our suppliers by spend to meet our Sustainable Procurement Code by 2026.

We have around 1,500 supply chain partners with a spend of around £500 million per year. In line with our supplier ESG reporting target, the top 80% of suppliers by spend – approximately £400 million – currently equates to around 105 suppliers.

We issued the Sustainable Procurement Code to all our suppliers last year and we have begun to receive carbon emissions data from suppliers for the first time this year. This data is enabling us to baseline our suppliers' ESG performance and build specific ESG training programmes for our suppliers.

Sustainability performance of our top 80% by spend suppliers

	2021/22	2022/23
Percentage of suppliers (by value) meeting our supplier code	80%	85%
Percentage of suppliers (by value) that have their own sustainability metrics or KPIs	45%	72%

Supplier Guidance Document

Alongside our Sustainable Procurement Code, we're creating a Supplier Guidance Document that will set out the roadmap and specific steps expected towards a transition to achieve our sustainability goals. The document will lay out clear guidelines and timeframes, which will assist our suppliers in improving their ESG performance in the years to come.

We will share our guidance document with our top 80% of suppliers by spend by October 2023 in support of our 2026 target to have at least 80% of our suppliers (by spend) meet our Sustainable Procurement Code by the end of this price control period.

Supply Chain Sustainability School

We have a complex supply chain. Of our top 105 suppliers, many are SMEs who are not bound to the same ESG reporting requirements or legislations as large organisations.

We're acutely aware that for our suppliers to provide us with the scope 1 and 2 emissions data that we require, we'll first need to support them in how to gather that data within their own organisations.

We've partnered with Supply Chain Sustainability School (SCSS) to improve the sustainability competencies of our supply chain. We're able to direct our supply chain partners to SCSS for access to free resources and training to improve their environmental performance.

We started providing training programmes to suppliers through the Supply Chain Sustainability School in March 2023 and this will continue through to early 2024.

Supplier engagement

We use two main methods of engaging with our suppliers. The first is direct engagement, for example around the Sustainable Procurement Code and our supplier ESG guidance, and the second is through the supply chain management platform Achilles.

Achilles makes gathering data from our suppliers more efficient and consistent. Around 800 of our suppliers have submitted mandatory financial, social, governance and health and safety data through the platform so far. We're working to get data from our ensure supply list of approximately 1,500 suppliers.

Our work to engage our suppliers in tackling climate change has been recognised by CDP, the not-for-profit global disclosure system. We're among the top 8% assessed for supplier engagement on climate change globally, based on our 2022 CDP disclosure.

Second ESG supplier survey

We carried out our second ESG supplier survey in March 2022, following on from the initial survey in November 2021.

This second ESG survey was targeted to our top 80% by spend suppliers. Our survey was also more specific this year, covering questions on specific steps our suppliers have taken around environmental, societal and governance considerations.

We had a strong response, with 91 of the 105 recipients completing the survey and uploading data on Achilles' platform.

Our supply chain partners tell us they are comfortable with the process of uploading information directly into Achilles. However, data reporting by our supply chain is still very much in its infancy. This means we were not able to gather all the information we required from our suppliers this year and we explain this further in our Statement on scope and quality of data section.

Efficient resource use and circular economy

By using resources more efficiently and preventing waste, we create a circular economy that sees us doing more with less.

To improve the circularity of our operations, we aim to:

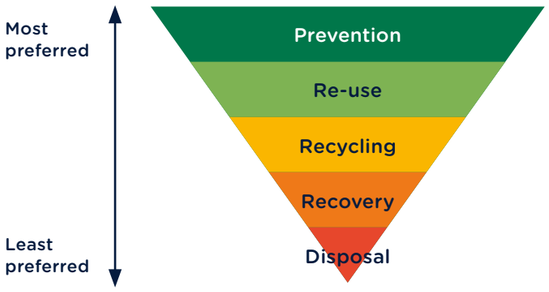
- send zero waste to landfill from our office, depots, reinstatement, construction/major projects by 2026, including non-hazardous waste from our gasholder dismantling programme
- recycle 93% of total materials and reuse 6.5% of total materials by 2026
- reduce the use of virgin aggregate to less than 20% in Scotland and 1% in our Southern network.

Current performance

In 2019, we submitted our Environmental Action Plan submitted to Ofgem as part of our RIIO-GD2 business plan. We defined our waste targets for RIIO-GD2 within that plan, including committing to sending zero waste to landfill by the end of the price control in 2026.

Our baseline landfill rates at that time were 2% with our waste management provider prioritising incineration. This is known as recovery on the waste management hierarchy.

Waste hierarchy



In 2020, we changed our waste management provider to Biffa. We now encourage waste prevention, reuse and recycling in line with the waste management hierarchy, ahead of recovery. However, as a result, we've sent higher proportions of waste to landfill over the past two years than our 2019 baseline.

We created 242,210 tonnes of waste in 2022/23 – approximately 96% was recycled and 4% went to landfill.

Waste management improvements

We've implemented a number of new activities this year to improve our resource usage and reduce waste, and will continue to do more to ensure we're on track to meet our zero waste to landfill target by 2026.

In collaboration with Biffa, we've carried out waste optimisation visits across our depots. From these visits, we're developing a programme of initiatives to optimise and improve recycling at key depots in 2023. We're hoping to improve waste segregation at our sites and potentially unlock new recycling or reuse opportunities for some waste streams. For example, we're looking at working with our supplier to take back and repair old barriers for reuse, rather than recycling them when they're no longer fit for purpose.

Our backloading initiative continues to work well. When depots order from our central stores, the vans collect waste from the depot at the same time as dropping off the new items. By 'backloading' the van, we're reducing carbon emissions from these journeys.

We've engaged a new waste provider to handle our PE pipe and fitting waste in Scotland. Previously, we used a Yorkshire-based company to process the scrap waste from our operations. Now we're using a Scotland-based company for our Scotland projects, we're reducing carbon emissions related to this activity.

Changing behaviour is key to improving our waste management and sending less waste to landfill. We're exploring ways of engaging our people with our waste management activities. For example, we're developing depot dashboards, which will allow us to compare waste performance between depots and encourage friendly competition to drive performance improvements.

Monitoring progress

To help us monitor our progress towards reducing waste across our business, we monitor waste under the following three streams:

- depot and office waste
- spoil waste from reinstatement
- non-depot waste generated by our construction, land remediation and gasholder dismantling activities.

Non-depot waste is a growing area of reporting and was previously an area we did not capture. We've improved how we monitor and collect waste data this year by capturing data from our Major Projects team. This team is responsible for our gasholder dismantling and decontamination projects. The addition of this data is enabling us to more accurately report on our non-depot waste.

While we improved the waste data we captured, it also identified that 94% of our total waste is attributed to spoil from our reinstatement activities. We need to focus on reducing our spoil waste by recycling as much of it as possible and only sending what is absolutely necessary to landfill.

	2021/22		2022/23	
Waste type	**Tonnes**	**% of total waste**	**Tonnes**	**% of total waste**
Depot and office waste	2,081	1%	1,384	1%
Spoil waste (reinstatement)	190,582	95%	228,371	94%
Non-depot waste	8,803	4%	12,455	5%
Total	**201,466**	**100%**	**242,210**	**100%**

	2021/22		2022/23	
Treatment type	**Tonnes**	**% of total waste**	**Tonnes**	**% of total waste**
Recycling/recovery	191,242	95%	227,612	94%
Energy from Waste (EfW)	936	0%	561	0%
Anaerobic digestion	20	0%	8	0%
Preparation for reuse	1,253	1%	5,045	2%
Landfill	7,999	4%	8,984	4%
Total	**201,499**	**100%**	**242,210**	**100%**

Efficient resource use and circular economy continued

Recycling waste
We're working with contractor DJ Utilities to recycle spoil from our projects instead of sending it to landfill.

Case study: Spoil recycling

Our mains replacement contractor DJ Utilities is helping us achieve a circular economy by recycling our waste into reinstatement material.

With the support of DJ Utilities, we're achieving circularity by recycling the spoil from our streetworks into a backfill material for reinstatement.

The contractor collects waste from all the gas mains replacement projects they carry out for us. At its licensed facility in West Sussex, DJ Utilities recycles the spoil into structural material for reinstatement (SMR). This recycled material is then used to reinstate excavations on other projects the contractor is completing for us.

Reducing the use of virgin aggregate
Using recycled SMR replaces the need for primary type 1 aggregate to be imported, supporting our strategic commitment to reduce the use of virgin aggregate.

Thanks to its recycling facility, DJ Utilities did not use any virgin aggregate on our projects this year.

Preventing waste to landfill
As well as reducing the use of virgin aggregate, recycling spoil from our projects prevents waste from being sent to landfill.

This year, more than 9,000 tonnes of waste from our DJ Utilities projects has been recycled and prevented from going to landfill.

We want to send zero avoidable waste to landfill by 2026 and by working with contractors like DJ Utilities, we're progressing towards our goal.

Environmental impacts continued

Local environment

We recognise the profound impact that the environment has on the quality of life and wellbeing of our people and the communities we serve.

During RIIO-GD2, we're committed to:

- improving or restoring environmental quality and/or biodiversity on sites we own and manage
- enhancing the environment at other locations within the communities we serve
- making our network and operations more resilient to climate change.

We've increased our investment in schemes to enhance our local environments significantly this year, having spent £230,172 in 2022/23 compared with £7,600 in 2021/22.

Biodiversity at our sites

By creating more healthy green areas on our land, we're able to boost biodiversity and may help improve air quality in our communities.

We've selected 142 sites across our Scotland and Southern network areas for ecosystem improvements over the RIIO-GD2 price control period. We've carried out 54 biodiversity baseline studies this year and actioned biodiversity improvement programmes at seven of our sites.

Across these seven sites, we have made the following improvements:

- planted 180 trees
- planted 550 metres of native hedging
- sown 6,000m² of wildflower seeds
- installed 12 bird boxes
- installed 12 bat boxes
- built 7 reptile hibernacula.

One of the first sites to be developed was our former gasholder site in Windygates, Fife. The site was no longer operational and had become overgrown. We created a nature walk and a wildflower meadow, as well as installed nesting boxes.

We've also engaged with Kennoway Men's Shed, a local community group who have created allotments on the site of a disused bowling club. The group created a bug hotel for our site.

Meanwhile, Napier University lecturer Colin Andrews planted an oak tree in our Windygates site as part of a wider project to reintroduce oak trees to Fife called Project Akin. The tree is already showing good signs of growth.

As well as the improvements to our site in Windygates, we also provided funding to primary schools close to our site for projects such as building bird boxes, bat boxes and bug hotels.

Our largest biodiversity improvement programme to date has been implemented at our Oban site. You can read more about the improvements we've made there in our biodiversity improvement case study on the following page.

Over the coming year, we're planning to carry out improvements on more sites across both our Scotland and Southern network areas.

Having now carried out initial biodiversity baseline studies at our sites, we will return to the sites after we've implemented our improvements to undertake further biodiversity studies. These return studies will enable us to review the impact our changes have had and provide net gain figures in future reports.

Climate change resilience

We implemented mapping software from Landmark Information Group in March 2022 to help us assess potential flooding risks to our network. The predictive flood model, FloodFutures, looks at the extent and depth of flooding considering different climate change scenarios and will allow us to understand and plan for long-tern flood risk.

We're improving the environmental quality and biodiversity on sites we own, such as Windygates, Fife.

So far, it's being used by our Environment, Network Planning and Property teams. Our Network Planning team has noticed an increase in flooding incidents and pipeline erosion due to climate change and this new tool will help identify areas of risk.

Our continued memberships of the ENA Climate Change Resilience Working Group and the Gas Environment Working Group allows us to share best practice with our industry peers. We're currently planning to develop a joint GDN flood protection standard for operational assets, much like the electricity networks have already done. We are working on this project with the ENA and are at an early stage of the process. Our current focus is on reviewing risk levels across sites.

For the first time within our 2023 SGN Annual Report, we've reported on how we identify, assess and manage our climate-related risks and opportunities using the Taskforce for Climate-related Financial Disclosures (TCFD) framework.

So far this year, we've planted 180 trees, planted 550m of native hedging and sown 6,000m² of wildflower seeds.

Environmental incidents

There have been no reportable environmental incidents in 2022/23.

A reportable environmental incident is an incident that has the potential to cause harm to the environment by polluting water or land, and is required to be reported to the relevant environmental regulatory body such as the Environment Agency or the Scottish Environment Protection Agency (SEPA).

We have not received warning letters, formal undertakings, enforcement notices, monetary penalties or prosecution from the EA or SEPA for this financial year.

Environmental near misses and hazards are identified through our internal incident reporting and tracking system, Velocity, and we use these as opportunities to review these lessons learnt to prevent recurring incidents and mitigate environmental impacts.

Local environment continued

Creating new habitats
Managing the woodland in Oban has created new homes for a variety of species.

Case study: Biodiversity improvement

We're increasing grassland, river and woodland biodiversity at our Oban site in one of our biggest biodiversity projects to date.

Woodland management has been central to our biodiversity improvements at our Oban site. We've planted new trees along the riverbank and open area to enhance the woodland diversity, including dwarf birch, hazel, pedunculate oak and rowan.

In addition, we've also carried out thinning and pollarding to improve the health and boost the longevity of existing woodland.

Seeding two areas of short grass with wildflowers will attract more insects, in turn attracting more wildlife and improving the habitat beyond amenity grassland. We've introduced yellow rattle as part of the wildflower mix, often known as the 'meadow maker' due to its ability to allow other wildflowers to flourish.

We've created new habitats for a variety of species to make our Oban site home.

Within the woodland, we've installed bird boxes for kingfishers, house sparrows and swifts, as well as some general species nest boxes. We also added nesting boxes for pine martins and red squirrels.

By carefully considered veteranisation, we've been able to create potential areas for bat roosting and we've installed bat boxes on trees above three metres to further encourage roosting on the site.

Along the riverbank, we've installed an artificial otter holt, plus hibernacula for amphibians and invertebrates. By clearing the fallen trees and rubbish from the river, we have improved its condition and the water is flowing better.

Statement on scope and quality of data

We aim to provide full disclosure of our progress and we've engaged independent assurance specialists to provide limited assurance on the quality of our data.

Introduction

This Annual Environmental Report (AER) provides our progress against targets and objectives as approved by the regulator Ofgem in line with the Final Determination for RIIO-GD2 price control.

The information we've provided is in line with the RIIO-GD2 Environmental Reporting Guidance Version 1.0 and RIIO-GD2 Gas Distribution Price Control Regulatory Instructions and Guidance: Version 1.15 (Chapter 13, sections 11.06 and 11.07).

The AER covers the second year of the price control period RIIO-GD2, which runs from 1 April 2022 up until and including 31 March 2023.

The data we've included in our AER is the same as we've presented to Ofgem in the Regulatory Reporting Pack (RRP) for the financial year 2022/23. According to the Regulatory Instructions and Guidance for RRP reporting, reporting scope 3 data is considered voluntary.

Data quality improvement of material scope 3 data is a focus for us over the next few years. We're also aware that we have data gaps – referenced in more detail in the Completeness of information section later on this page – which we are tackling and aiming to eliminate. Therefore we have decided not to disclose full scope 3 carbon emissions this year.

Our scope 1 and 2 greenhouse gas emissions including shrinkage have been independently assured by ERM CVS and you can find the independent Assurance Report in Appendix 2.

While scope 3 data is voluntary, we have decided to disclose the date we're capturing in this year's report. This data has not been subject to limited assurance by ERM CVS.

Reporting boundary

The AER includes data from our company footprint in Scotland and Southern and does include data from our non-regulated business (our commercial entities).

As our regulated and non-regulated businesses share office buildings and company services, it would require a disproportionate amount of resource to try to separate waste disposal and business travel of the non-regulated business.

Our AER also does not include data on our network in Northern Ireland.

In most cases, our environmental targets and objectives relate to our Scotland and Southern networks collectively. For that reason, the data you'll find in this report covered both these network areas. We consider this approach to be most helpful for our customers and stakeholders wanting to understand our environmental performance, despite Ofgem guidance sometimes asking for data to be reported on a licence level.

Data collection

We have refined our processes for data collection over the past year. We have identified where we have gaps and where we still want to improve, but overall our processes are now running much smoother compared to last year.

We're using an online data reporting tool called Rio for our data collection, following regulatory guidance. The tool enables us to upload raw data to the web-based platform and the associated greenhouse gas emissions are calculated using the latest DEFRA conversation factors.

We collect the following data per relevant carbon emissions scope, as defined by the Greenhouse Gas Protocol:

- Scope 1: shrinkage
- Scope 1: transport from owned vehicles or vehicles under our control and gas consumption from owned boilers, including energy usage from shared sites
- Scope 2: purchased electricity, including energy usage from shared sites
- Scope 3: indirect emissions from our value chain.

We collect all data relevant to scope 1 and 2 emissions and such data is presented in this report. To be consistent across our leased and shared sites, all energy usage from our offices and depots is reported as scope 1 and 2 data, using the operational control approach as per Greenhouse Gas Protocol. For shared sites we are reliant on data provided by our landlord.

When it comes to scope 3 emissions, we currently collect data in the following scope 3 categories and from the following emission sources:

- Purchased goods and services: reinstatement material
- Purchased goods and services: water
- Capital goods: PE pipe
- Fuel and energy-related activities: transmission and distribution of electricity
- Fuel and energy-related activities: gas well-to-tank
- Upstream transportation and distribution: contractors' vehicles/transport movements
- Waste generated in operations: excavation spoil disposal, office and depot waste disposal and non-depot waste disposal
- Business travel: business mileage in vehicles not owned or controlled by the company
- Business travel: rail, air, ferry and car hire

While we collect several elements of our scope 3 data, we're aware this is not exhaustive and there are many data gaps.

This report also includes information on biomethane connection data, innovation investment, sustainable procurement, investment in local environment, biodiversity improvement and environmental incidents. This data has not been independently assured by a third party.

Completeness of information

We engaged ERM CVS to provide limited assurance of the total scope 1 and scope 2 (location-based) greenhouse gas emissions, including shrinkage. Nothing has come to their attention to indicate that the 2022/23 data and information for the disclosures listed under 'Scope' are not fairly presented in the Report, in all material respects, in accordance with the reporting criteria.

In 2021/22, we carried out a screening exercise that estimated scope 3 emissions make up approximately 18% of our total carbon footprint, based on financial spend. The exercise also helped us identify the order of magnitude of scope 3 elements, so we could understand which data is most important for us to try to capture.

Reinstatement services make up approximately 26% of our supplier spend and 45% of our scope 3 emissions. Therefore, we've focused on obtaining reliable data from these suppliers as a priority.

At the time of data gathering for this year's AER, we had the following data gaps relating to scope 3:

- Purchased goods: we are not yet capturing all data related to purchased goods and services and capital goods. We are capturing data from our PE pipe suppliers and from reinstatement services. We want to improve data capture in relation to materials (in particular steel pipe and fittings) and other gas network equipment.
- Reinstatement services:
  - Materials: there was a small number of data gaps from contractors, due to various reasons including the company ceasing to operate. For these gaps, we have estimated the data based on previous months.
  - Contractor vehicles/transport movements: we have some small data gaps in the figures reported for contractors' carbon. This includes months where no reporting has been made for certain contractors. For these gaps, our data reporting tool Rio has estimated the figures based on the previous month's performance.
- Water: the carbon associated with water treatment is not included at this time.
- Employee commute and upstream leased assets: we have not captured data relating to employee commuting and we do not currently own or lease upstream assets, so there is no emissions data report for these two areas.
- Waste in operations:
  - Spoil to landfill: we do not have a high confidence in the contractors' submissions for spoil to landfill so we have agreed on a methodology to use the 2022/23 total spoil figures and the 2021/22 spoil to landfill percentage to calculate a reasonable 2022/23 estimate. This method was discussed and agreed with the Environment team and Reinstatement managers. Moving forwards, we will be working with the contractors to improve the reliability of this data, so we don't need to estimate for the 2023/24 submission. This impacts both reporting in our scope 3 carbon emissions as well as reporting on efficient resource use and circular economy.

While we do have data gaps, we are sharing all the scope 3 data that we are currently capturing. In identifying our current data gaps, we have an opportunity to further improve our data collection and reporting. We aim to capture all material scope 3 by the end of RIIO-GD2.

For our reporting on efficient resource use and circular economy, we would also like to highlight an additional area where we can improve our data capture:

- Virgin aggregate: we do not have full confidence in this data but are working to improve the data checking and auditing methods to improve reporting for 2023/24.

Quality of data

We've detailed the same data in this report as we've provided in the Regulatory Reporting Pack (RRP) for Ofgem. It has been calculated following the Regulatory Instructions and Guidance (RIGS) from the regulator. In all cases, we use DEFRA conversion factors for the calculation of raw data to carbon dioxide equivalent emissions. The process for this is aligned with international standard, as per the Greenhouse Gas Protocol.

The data we submit in the RRP goes through an internal Data Assurance Guidance process. This involves several layers of internal checking of data provided with final approval from a responsible director.

We engaged independent assurance specialists ERM CVS to provide limited assurance on whether our 2022/23 data is fairly presented within our Annual Environmental Report in line with the reporting criteria:

- Total scope 1 direct GHG emissions [tonnes CO_2e]
- Shrinkage GHG emissions [tonnes CO_2e]
- Total scope 2 indirect GHG emissions (location-based method) [tonnes CO_2e]

The limited assurance was undertaken using the ERM CVS assurance methodology, which follows the International Standard for Assurance Engagements ISAE 3000 (Revised).

The Assurance Report from ERM CVS can be found in Appendix 2.

Appendices

Additional data relating to our environmental performance this year, including independent assurance of the data included in this report.

Appendix 1 – Emissions data

ERM CVS was engaged to provide limited assurance of Total Scope 1, Scope 2 (location-based) and Total Shrinkage emissions data. Please see ERM CVS' Assurance Report for further details.

Shrinkage

Total SGN leakage volumes

SGN	Actual 2021/22 (GWh)	Actual 2022/23 (GWh)	Forecast 2022/23 (GWh)
Low pressure mains	356.45	342.34	–
Medium pressure mains	55.65	55.43	–
Services	71.81	66.59	–
AGIs	96.01	95.64	–
Interference	1.83	1.88	–
Total	**581.75**	**561.88**	**563.6**

SGN	Actual 2020/21 (tCO_2e)	Actual 2021/22 (tCO_2e)	Actual 2022/23 (tCO_2e)
Shrinkage (leakage, own gas use and theft of gas)	740,826	721,448	696,634

Leakage volumes by network

Scotland and SIU	Actual 2021/22 (GWh)	Actual 2022/23 (GWh)	Forecast 2022/23 (GWh)
Low pressure mains	84.58	79.67	–
Medium pressure mains	15.22	15.17	–
Services	18.44	17.04	–
AGIs	34.79	34.61	–
Interference	0.57	0.55	–
Total	**153.60**	**147.05**	**149.60**

Southern (SO and SE)	Actual 2021/22 (GWh)	Actual 2022/23 (GWh)	Forecast 2022/23 (GWh)
Low pressure mains	271.87	262.67	–
Medium pressure mains	40.44	40.26	–
Services	53.36	49.54	–
AGIs	61.26	61.03	–
Interference	1.26	1.33	–
Total	**428.19**	**414.84**	**414.00**

Leakage emissions

Leakage emissions are calculated using conversation factor 1,226.42 tCO_2e/GWh.

SGN	Actual 2021/22 (tCO_2e)	Actual 2022/23 (tCO_2e)
Leakage emissions	713,473	689,106

Note – this is based on global warming potential, GWP, for unburned gas, as available from DESNZ. If this changes during the price control period, Ofgem will consult on how this will affect reported emissions.

Other shrinkage volumes

SGN	Actual 2021/22 (GWh)	Actual 2022/23 (GWh)
Own use	15.72	14.89
Theft	27.82	26.35
Total	**43.54**	**41.24**

Other shrinkage emissions

Other shrinkage emissions are calculated using conversation factor 183.85 tCO_2e/GWh, the conversion factor for burned gas.

SGN	Actual 2021/22 (tCO_2e)	Actual 2022/23 (tCO_2e)
Own use	2,879	2,718
Theft	5,096	4,811
Total	**7,976**	**7,528**

Appendix 1 – Emissions data continued

Scope 1 and 2 emissions

Emissions (tCO_2e)	Specific area	Actual 2021/22 (tCO_2e)	Actual 2022/23 (tCO_2e)	Target 2025/26
Scope 1	Commercial fleet (operational transport)	11,738	12,896	14,966
	Company cars (operational transport)	1,070	1,183	
	Gas (building energy use)	5,907	3,143[1]	
Scope 2	Purchased electricity (building energy use)	192 (market-based)	32 (market-based[2])	–
		2,652 (location-based)	2,622 (location-based[3])	2,428 (location-based)
Gas shrinkage		721,448	696,634	618,583
Scope 1 total		**740,163**	**713,856**[4]	**–**
Scope 2 total (location-based)		**2,652**	**2,622**[4]	**–**
Scope 1 and 2 total (excluding shrinkage)		**21,367**	**19,844**	**17,395**
Scope 1 and 2 total (including shrinkage)		**742,815**	**716,478**	**635,978**

[1] Our scope 1 emissions from gas include a CHP engine associated with our turbo expander at our St Mary Cray depot in the Southern network. Technically this does not produce heat for our buildings but supports the production of renewable electricity at one of our pressure reduction facilities.

[2] Our market-based scope 2 emissions from procured electricity for building use are based on certified renewable electricity from our suppliers. The majority of the electricity we use – 98.7% – is certified renewable.

[3] A location-based method reflects the average emissions intensity of grids on which energy consumption occurs (using mostly grid-average emission factor data.

[4] All data marked with footnote 4 has been independently assured by ERM CVS.

Appendix 1 – Emissions data continued

Scope 3 emissions

Category	Emissions source	Unit	2021/22	2022/23	Comment
Indirect emissions					
Purchased goods and services	Reinstatement materials	tCO_2e	49	4,007	Big data gaps in last year's data capture. This year we are confident we have captured all materials used and made estimates in the few instances where data was missing.
	Water	tCO_2e	3	10	We are collecting all data here based on our water consumption. Emissions associated with Water treatment is not included. Water usage is not a material aspect of our operations.
	Total	**tCO_2e**	**52**	**4,017**	Purchased goods and services represent a category of material emissions to our business. Over GD2 we are aiming to capture more data in this category where possible.
Capital goods	PE pipe and fittings	tCO_2e	8,696	10,249	PE pipe is one of our main expenditure for capital goods and we have been collecting data from our suppliers since 2014. For the last two years we are using weight of PE pipe purchased and the DEFRA conversion factor for 'Plastic: rigid' to calculate our embodied emissions.
	Total	**tCO2e**	**8,696**	**10,249**	Capital goods represent a category of material emissions to our business. Over GD2 we are aiming to capture more data in this category where possible.
Fuel and energy related activities	T&D losses – Electricity	tCO_2e	222	228	T&D losses and well-to-tank is based on data gathered from utility bills (energy consumption) and commercial fleet and business car use. We did not capture our well-to-tank for commercial fleet and business cars in 21/22 (scope 1 vehicles).
	Well to tank – Electricity & Gas	tCO_2e	1,013	1,186	
	Well to tank – Scope 1 vehicles	tCO_2e	0	3,389	
	Total	**tCO_2e**	**1,235**	**4,804**	Fuel and energy related activities have some material impact on our overall scope 3 emissions.
Upstream transportation and distribution	Contractor vehicles/transport	tCO_2e	7,825	10,772	We are capturing transport data from our reinstatement contractors which make up approximately 26% of our spend profile. Last years data had data gaps, this year we have managed to collect the majority of actual data and where minor data gaps existed we estimated emissions based on previous months performance.
	Contractor helicopter	tCO_2e	0	304	Helicopters are used to survey pipelines. Last year we did not capture this data.
	Total	**tCO_2e**	**7,825**	**11,075**	We are not capturing all data relevant here to upstream transport and distribution. It is a category with smaller materiality for our overall scope 3 emissions.
Waste generated in operations	Excavation spoil disposal	tCO_2e	7	459	Emissions from waste in operations are based on data captured for spoil, waste from offices and depots, and other operations. Confidence in last year's figures are low with suspected errors in data collection.
	Office and depot waste disposal	tCO_2e	174	90	
	Non depot waste incl. holder demo	tCO_2e	894	457	
	Total	**tCO_2e**	**1,075**	**1,006**	Waste generated in operations have no material impact on our overall scope 3 emissions.
Business travel	Business mileage in vehicles not owned/controlled by company	tCO_2e	156	253	Business travel has increased with further abandonment of COVID restrictions. Our emissions here are still low compared to pre-COVID, indicating new ways of working.
	Rail	tCO_2e	2	13	
	Air	tCO_2e	261	347	
	Ferry	tCO_2e	1	2	
	Hire cars	tCO_2e	0	94	
	Total	**tCO_2e**	**420**	**709**	Business travel has no material impact on our overall scope 3 emissions. It is however an area where culture change an behaviour impact is important.
Employee commuting	**Total**	**tCO_2e**	**0**	**0**	We are currently not capturing employee commuting data. This category is not material to our business.
Total scope 3					
Scope 3	**Total**	**tCO_2e**	**19,302.9**	**31,859.1**	With improvements in our data capture processes over 2022/23, we have higher confidence in the data we are capturing and monitoring.

Independent Limited Assurance Report to Scotia Gas Networks Limited

ERM Certification and Verification Services Limited ("ERM CVS") was engaged by Scotia Gas Networks Limited ("SGN") to provide limited assurance in relation to the selected information set out below and presented in the SGN Annual Environmental Report 2022/23 (the "Report").

Engagement summary	
Scope of our assurance engagement	Whether the 2022/23 data for the following selected disclosures, as indicated on pages 36 and 37 are fairly presented in the Report, in all material respects, in accordance with the reporting criteria: • Total Scope 1 direct GHG emissions [tonnes CO2e] • Shrinkage GHG emissions [tonnes CO2e] • Total Scope 2 indirect GHG emissions (location-based method) [tonnes CO2e] Our assurance engagement does not extend to information in respect of earlier periods or to any other information included in the Report.
Reporting period	1st April 2022 – 31st March 2023
Reporting criteria	• RIIO-2 Gas Distribution Price Control - Regulatory Instructions and Guidance: Version 1.15 11 April 2023 chapter 13 section 11.06 • RIIO 2 Environmental Reporting Guidance Version 1.0, 2 March 2021 • SGN's Statement on scope and quality of data (pages 33 and 34 in the Report)
Assurance standard and level of assurance	We performed a limited assurance engagement, in accordance with the International Standard on Assurance Engagements ISAE 3000 (Revised) 'Assurance Engagements other than Audits or Reviews of Historical Financial Information' issued by the International Auditing and Standards Board. The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for a reasonable assurance engagement and consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.
Respective responsibilities	SGN is responsible for preparing the Report and for the collection and presentation of the information within it, and for the designing, implementing and maintaining of internal controls relevant to the preparation and presentation of the Report. ERM CVS' responsibility is to provide conclusions to SGN on the agreed scope based on our engagement terms with SGN, the assurance activities performed and exercising our professional judgement.

Our conclusion
Based on our activities, as described overleaf, nothing has come to our attention to indicate that the 2022/23 data and information for the disclosures listed under 'Scope' above are not fairly presented in the Report, in all material respects, in accordance with the reporting criteria.

Our assurance activities
Considering the level of assurance and our assessment of the risk of material misstatement of the selected information a multi-disciplinary team of sustainability and assurance specialists performed a range of procedures that included, but was not restricted to, the following:
- Evaluating the appropriateness of the reporting criteria for the selected information.
- Performing an analysis of the external environment, including a media search, to identify sustainability risks and issues in the reporting period that may be relevant to the assurance scope.
- Interviews with management representatives responsible for managing the selected issues.
- Interviews with relevant staff to understand and evaluate the management systems and processes (including internal review and control processes) used for collecting and reporting the selected disclosures.
- A review at corporate level of a sample of qualitative and quantitative evidence supporting the reported information.
- Reviewed inputs into the accepted Gas Distribution Network (GDN) Shrinkage and Leakage Model (SLM). Our review did not include a review of the components, assumptions and calculations used within the SLM.
- An analytical review of the year-end data submitted by all locations included in the consolidated 2022/23 group data for the selected disclosures which included testing the completeness and mathematical accuracy of conversions and calculations, and consolidation in line with the stated reporting boundary.
- Assessing the conversion factors, emission factors and assumptions used.
- Reviewing the presentation of information relevant to the scope of our work in the Report to ensure 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 conclusions in this context.

Emphasis of Matter
Without affecting our conclusion, which is not modified, we draw attention to the explanatory note provided by SGN relating to collection of data for shared sites on page 33 of the Annual Environmental Report 2022/23.

Our independence, integrity and quality control
ERM CVS is an independent certification and verification body accredited by UKAS to ISO 17021:2015. Accordingly we maintain a comprehensive system of quality control, including documented policies and procedures regarding compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements. Our quality management system is at least as demanding as the relevant sections of ISQM-1 and ISQM-2 (2022).

ERM CVS applies a Code of Conduct and related policies to ensure that its employees maintain integrity, objectivity, professional competence and high ethical standards in their work. Our processes are designed and implemented to ensure that the work we undertake is objective, impartial and free from bias and conflict of interest. Our certified management system covers independence and ethical requirements that are at least as demanding as the relevant sections of the IESBA Code relating to assurance engagements.

ERM CVS has extensive experience in conducting assurance on environmental, social, ethical and health and safety information, systems and processes, and provides no consultancy related services to SGN in any respect.

Gareth Manning
Partner, Corporate Assurance
London, United Kingdom
29 September 2023

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If you smell gas or are worried about gas safety you can call the National Gas Emergency Number on **0800 111 999**

Carbon monoxide (CO) can kill. For more information visit **sgn.co.uk/help-and-advice**