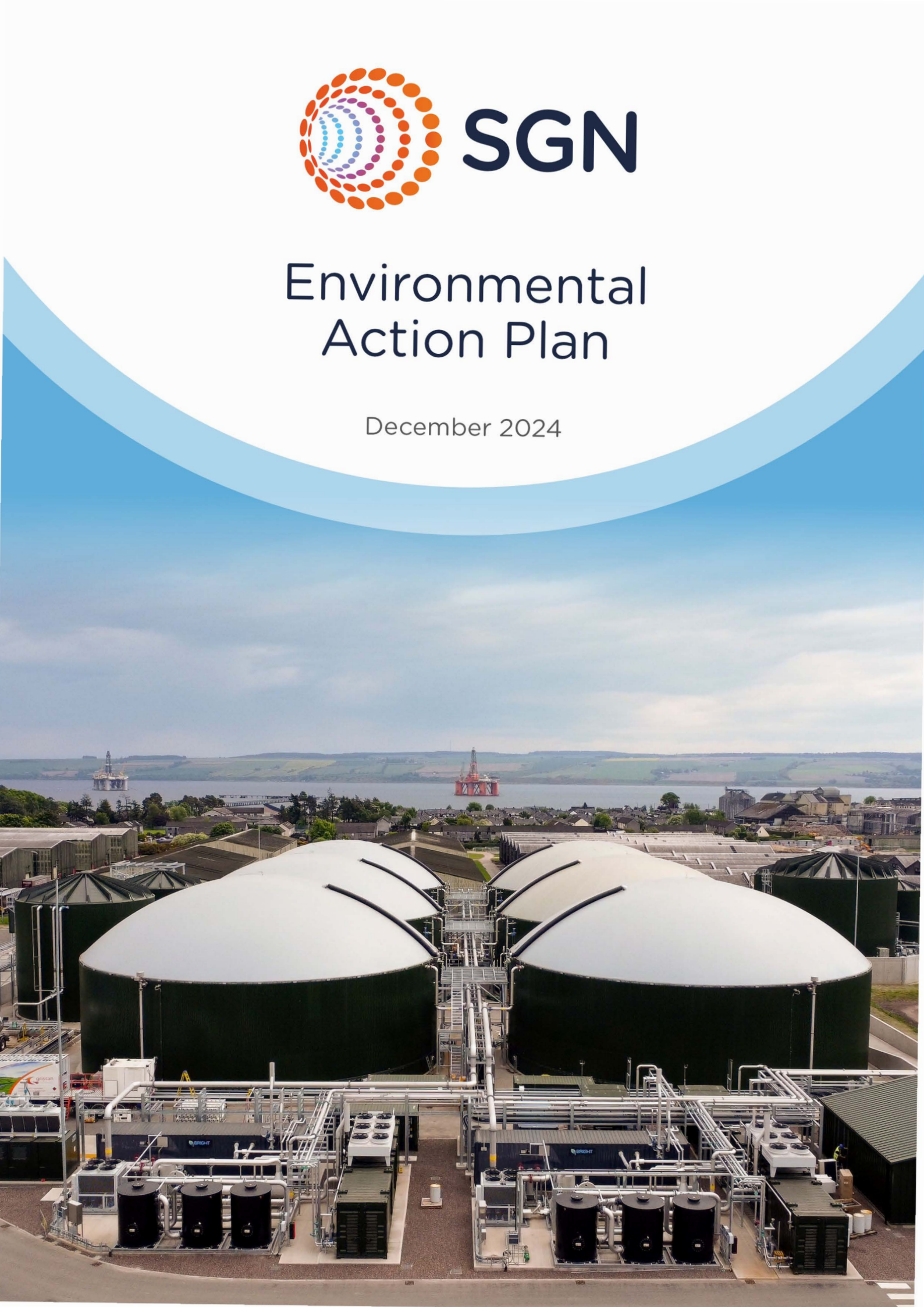
SGN

Environmental Action Plan

December 2024



Contents

ENVIRONMENTAL ACTION PLAN **1**
Executive summary 1
Introduction 3

Section A Ambition and objectives of our Environmental Action Plan **8**

Section B Background and context **11**
Methodology assessing our significant environmental impacts 11
Environment Strategy 13
Aligning with global goals 13
Past performance – RIIO-2 in review 15
Outcomes and Commitments 20
Customer and Stakeholder Insights 20

Section C Environmental Action Plan **24**
1. Net zero business carbon emissions 26
2. Supplier partnerships 42
3. Circular economy transition 43
4. Protect and enhance biodiversity 44
5. Support for greener fuels like biomethane and hydrogen 46

Section D Managing risk and uncertainty **51**
SGN's potential environmental impacts in RIIO-3 without intervention 51

Section E Engineering Justification Papers and Cost Benefit Analysis **52**
Conclusion 53

Abbreviations **54**

Environmental Action Plan

Executive summary

1 Our Environmental Action Plan (EAP) brings together the initiatives and projects across SGN which will contribute to our improved environmental impacts. It builds on the five environmental priorities we identified in our Environment Strategy (Section B: Environment strategy) and our RIIO-2 environment plan:

1. Achieve net zero business carbon emissions;
2. Engage in meaningful supplier partnerships;
3. Drive towards a circular economy transition;
4. Protect and enhance biodiversity; and
5. Support the introduction of greener fuels like biomethane and hydrogen.

2 We outline the initiatives we propose to take, the environmental benefits and the cost of the interventions. Our approach underpinning this EAP fully aligns with Ofgem's key outcomes and builds on our strategy embedded in GD2. It also supports the six key Sustainable Development Goals (SDGs) which are most aligned with our business (Section B: Aligning with global goals).

Figure 1: Our initiatives to improve the environment are aligned with our environmental priorities and the United Nations Sustainable Development Goals

3 This plan reflects the views expressed by our customers and stakeholders through various stakeholder engagement sessions (Section B: Customer and stakeholder insights). Our customers and stakeholders express a high appetite for increased investment of time and money in "low-carbon energy solutions" and a slightly lower appetite for investment in "improving environmental performance".

4 **Net Zero Business Carbon Emissions** – Carbon emissions is the greatest of our environmental aspects (Section B: Methodology assessing our environmental impacts), so this plan focuses on reducing emissions and our aspiration to keep them in alignment with science-based targets. **We will reduce our operational carbon footprint by 46% compared to our 2019 baseline with a focus on reducing methane emissions** (Section C: Net zero business carbon emissions). Emission reductions can above all be achieved by reducing leakage from our network, and we describe a series of interventions on how this can be done including an innovative opportunity to measure real leakage data and focus on repair and replacement in areas where this is highest. This has significant safety benefits as well as reducing our environmental emissions. Read more about this in Section C where we discuss Repex and propose initiatives on Advanced Methane Detection, Intelligent Gas Grid and new Remote Pressure Management, as well as a new exciting innovation in Digital Platform for Leakage Analytics.

5 **Supplier Partnerships, Circular Economy and Biodiversity** – Improving our environmental impacts also means engaging with our supply chain to work collaboratively to identify opportunities to reduce emissions in the value chain (Section C: Supplier partnerships), collaborating across the industry with other Gas Distribution Networks and utility organisations, identifying innovative approaches to reduce emissions, waste, and resource use (Section C: Circular economy transition) and protecting and enhancing biodiversity and nature in the communities where we operate (Section C: Protect and enhance biodiversity).

6 **Greener Fuels** – Our EAP also shows how we will contribute to a UK net zero economy by supporting and enabling more green gases in the network through biomethane and hydrogen blending (Section C: Support for greener fuels like biomethane and hydrogen). This section includes our biomethane strategy and the exciting opportunity to introduce compressed biomethane gas to two of our SIUs (Statutory Independent Undertakings), remote gas networks which we support, demonstrating how areas of our network can be effectively decarbonised (A biomethane gas solution for Wick and Thurso SIU networks).

7 In Section D we discuss the uncertainties associated with this plan, how we will manage these and the impact of not taking the actions outlined in this EAP (SGN's potential environmental impact in RIIO-3 without intervention). Section E summarises the Engineering Justification Papers (EJPs) and Cost Benefit Analysis (CBAs) that support this plan.

8 Table 1 summarises what this EAP will deliver should we get the associated funding. It also shows the progress and change compared to the current price control RIIO-2.

Table 1: What our EAP sets out to deliver: KPIs and targets for the RIIO-2 and RIIO-3 periods, and our longer-term targets

Environmental priorities	KPI	Current progress[1]	RIIO-2 target	RIIO-3 target	Long-term target
1. Net zero business carbon emissions	**Business carbon footprint (BCF) (Scope 1 and 2) emissions excl. shrinkage**	18,215 tCO2e	Reduce by 25% compared to baseline (2019): 17,395 tCO_2e	Reduce scope 1 & 2 incl. shrinkge by 46% compared to baseline (2019):	Net zero by 2045
	Shrinkage emissions	671,496 tCO2e	Reduce in line with shrinkage forecast:		

[1] Position at the end of Financial Year 2023/24 as per our Annual Environmental Report.

			615,813 tCO_2e	418,359 tCO2e	
2. Supplier partnerships	**Suppliers meeting sustainable procurement code**	85%	80% of suppliers meeting Sustainable Procurement Code	At least 85% of suppliers meeting Sustainable Procurement Code	All of our suppliers to have net zero targets in place by 2040
3. Circular economy transition	**Waste to landfill**	4% depot waste to landfill 6% overall waste to landfill	Zero depot waste to landfill	Reduce waste to landfill by 5%	Zero avoidable waste to landfill by 2035
4. Protect and enhance biodiversity	**Biodiversity studies**	102 biodiversity studies completed 21 improvement projects completed	Perform biodiversity studies on land we own and manage in the long-term	Biodiversity net gain 10%	Maintaining biodiversity net gain
5. Support for greener fuels like biomethane and blended hydrogen	**Enabling biomethane**	Equivalent of 289,620 customers using biomethane	Ambition to have equivalent of 450,000 customers using biomethane	We will work collaboratively to maximise biomethane injection and reduce connection times for producers to provide the capacity to transport it to the equivalent of one million homes.	No long term target has been identified

Source: SGN data

Introduction

9 In this document you will read how we are proposing to decarbonise our operations, support the energy transition to a net zero economy and improve our material environmental impacts.

10 We manage and maintain an energy delivery system, paid for by customers, which, on a peak winter's day, every hour our network carries the same energy content as the entire UK electricity network[2] to homes, businesses, and industry. In addition to heating and cooking, natural gas is used for power generation and is an important fuel for many industrial processes. Our network, through our safety driven Repex programme, is increasingly becoming a viable, future-proofed hydrogen gas delivery system, already connected to 6 million domestic and business customers.

11 The gas networks are an existing national infrastructure and clean energy delivery system which can support the government's net zero ambition. Our role is to ensure the network continues to comply with our safety case, serves our communities by keeping everyone safe and warm, and builds on the evidence base required by government to validate its role in our clean energy future.

[2] https://assets.publishing.service.gov.uk/media/66a7da1bce1fd0da7b592f0a/DUKES_2024_Chapter_5.pdf

12 This is a clear expectation from our stakeholders, and they remain largely aligned with the views we used to develop and deliver our RIIO-2 business plan five years ago. Our engagement for RIIO-3 has highlighted that ensuring the future role of the gas network through compatibility with green gases is now an even stronger priority.

13 We have facilitated biomethane customer requirements across previous price controls providing a connection service to meet the technical and economic drivers of the industry in a timely manner to meet connection deadlines. However, a combination of increasing numbers of biomethane gas connections across GD2 and forecast growth in this sector requires us to proactively plan and implement changes to facilitate a growing volume of biomethane gas.

14 The biomethane strategy builds on the strong history we have demonstrated over the last 12 years in the biomethane sector to transition the network to an asset capable of meeting the challenges of decarbonising Britain's energy system by supporting the expansion of the biomethane industry. Biomethane offers massive potential as part of the UK's transition to clean energy and to us as a network operator to decarbonise large sections of the distribution network. To ensure this happens we must ensure the business transitions to a biomethane ready environment where biomethane injection potential is recognised and facilitated in line with customer requirements.

15 This Environmental Action Plan (EAP) forms part of our RIIO-GD3 (GD3) Business Plan submission in line with Ofgem's Sector Specific Methodology Decision (SSMD) for the Gas Distribution Networks and the RIIO-3 Business Plan Guidance. In it, we set out:

(a) **Section A – Ambition and objectives of our Environmental Action Plan**: Our long-term targets beyond RIIO-3 and the interim targets in the upcoming price control. This section provides a summary of the initiatives and activities we will carry out to reach those targets.

(b) **Section B - Background and context**: This section provides information about the societal background and the environment we are operating in, the methodology for identifying and assessing our environmental impacts, as well as the priorities of our Environment Strategy. It also includes a summary of progress to date on our RIIO-2 EAP and input received from customers and stakeholders.

(c) **Section C - Environmental Action Plan**: This section sets out our Environmental Action Plan activities in detail including our biomethane strategy. Our biomethane strategy for GD3 focuses on growing the volume of biomethane conveyed in our network by meeting the biomethane industry's requirements for connected capacity and efficient and economic connections. The strategy will ensure we are ready to transition to a low carbon, green energy mix in our network to ensure the SGN distribution network is ready for Britain's net zero requirements.

(d) **Section D - Managing risk and uncertainty:** This section discusses key uncertainties and risks in relation to our plan and what the impacts would be of no intervention.

(e) **Section D – Engineering Justification Papers and Cost Benefit Analysis**: A summary of supporting documentation.

16 Throughout this document we discuss our Business Carbon Footprint (BCF). This is our biggest environmental impact. A summary of the different types of emissions which make up our emissions profile is provided in the Business Carbon Footprint panel below. Carbon emissions are categorised in greenhouse gas emission scopes, which are defined by the Greenhouse Gas (GHG) Protocol, the world's most widely used greenhouse gas accounting standard.

Business Carbon Footprint (BCF)

Scope 1: emissions we are in direct control of through ownership i.e. commercial fleet, boilers for heating offices and company cars.

Shrinkage: leakage, own gas use, and theft. Leakage makes up 94% of shrinkage.

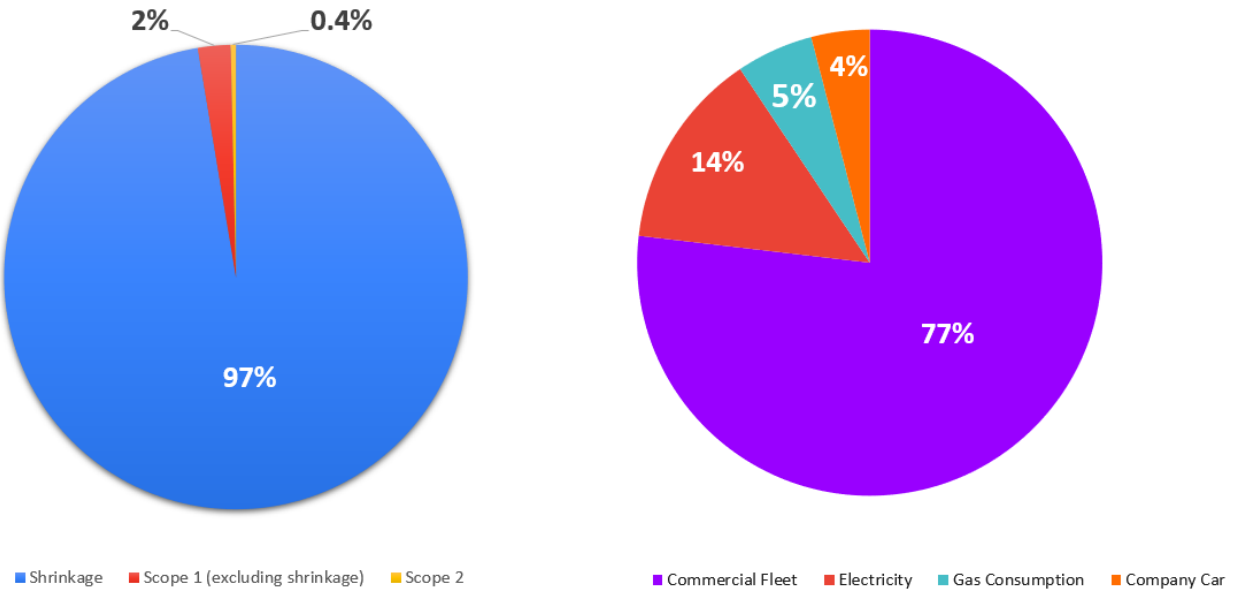
Scope 2: electricity we purchase.

- Location based: method reflects the average emissions intensity of grids on which energy consumption occurs (using mostly grid-average emission factor data).
- Market based: reflects emissions from electricity that the company have purposefully chosen, in this case 100% renewable electricity tariff.

Scope 3: indirect emissions, i.e. from supply chain, business travel, support services.

17 Our shrinkage carbon emissions have by far the biggest impact on our overall BCF (97%). The remaining 3% is down to our commercial fleet, followed by electricity, gas, and company cars. We are not yet capturing the full set of our scope 3 emissions which is why these indirect emissions are not part of the chart in figure 2. It is worth noting that leakage makes up 94% of shrinkage.

Figure 2 SGN's Business Carbon Footprint. The first pie chart shows the relationship between shrinkage and scope 1 (excluding shrinkage) and scope 2. The second pie chart shows the proportion of emissions excluding shrinkage.



Source: Carbon emissions data from Annual Environmental Report 2023/24.

18 We have cross-referenced this EAP to other documents within our Business Plan to avoid unnecessary duplication and to facilitate greater understanding of how our EAP integrates with the many other aspects

of our GD3 submission. This EAP further draws together the direct carbon impacts claimed in the Investment Decision Pack (IDP) submissions as per Ofgem Business Plan Guidance 4.19. Table 2 summarises our initiatives, the relevant Business Plan submission documents they link to, funding request and funding mechanism. Detailed engineering justification papers (EJPs) and cost-benefit analysis (CBAs) for investments provide our options analysis identifying the value for money of initiatives to reduce our environmental impact. With methane emissions from leakage being our biggest environmental impact, this has a clear focus in our EAP and, therefore, also the largest associated funding request for investment. This is followed by transition to greener gases and our opportunity to make a significant impact in relation to our customers heating requirements.

Table 2: Overview of our EAP initiatives, supporting documentation, associated capex and funding mechanism

Environmental priority	Initiative	Relevant IDP / Appendix	Cost (£m)	Funding mechanism
1. Net zero business carbon emissions	Repex	Asset management strategy SGN-GD3-SD-06	Not included in EAP	Not included in EAP
	Advanced Methane Detection	Advanced methane detection EJP (SGN-GD3-EJP-DST-001) CBA (SGN-GD3-CBA-DST-SOU-001)	12.4	NZARD UIOLI
	Ongoing maintenance of existing pressure management systems	EJP (SGN-GD3-EJP-DST-010)	11.2	Baseline
	New Remote Pressure Management	Pressure management EJP (SGN-GD3-EJP-DST-009) CBA (SGN-GD3-CBA-DST-SOU-009)	11.22	NZARD UIOLI
	Digital Platform Leakage Analytics (DPLA)	n/a	50	Estimated value/ Re-opener (NZASP)
	Intelligent Gas Grid (IGG)	Intelligent Gas Grid EJP (SGN-GD3-EJP-DST-006)	7.1	NZARD UIOLI
	Solar PV		3.49	Baseline

	Battery storage	Property Management EJP (SGN-GD3-EJP-PRO-003) CBA (SGN-GD3-CBA-PRO-003)	0.60	
	LED		0.44	
	Insulation		1.44	
	Smart tech		2.15	
	Retiring vehicles after 5 years to modernise the fleet and increase proportion of alternatively fuelled vehicles.	Fleet EJP (SGN-GD3-EJP-FLE-001) CBA (SGN-CBA-EJP-FLE-001)	Leasing model – no capex	Baseline
	Transition to zero emissions company cars			
2. Supplier partnerships	Reduction of embodied carbon[3]	Environmental Action Plan	n/a	
	Engagement with supply chain			
	Supply chain meeting our Sustainable Procurement Code			
	Improve data capture of indirect emissions (scope 3) with an aim to set a baseline for future reduction target			
3. Circular economy transition	Reduce waste	Environmental Action Plan	n/a	n/a
	Increase reuse and recycling of materials			
4. Protect and enhance biodiversity	Maintaining our estate to deliver long-	Property Management EJP (SGN-GD3-EJP-PRO-003)	n/a (embedded in Property EJP)	n/a

[3] Embodied carbon refers to the emissions associated with materials and construction throughout the whole lifecycle of an infrastructure project.

	term biodiversity improvements			
	Opportunities to deploy nature-based solutions	Climate Resilience Strategy (SGN-GD3-SD-02)	n/a	n/a
5. Support for greener fuels like biomethane and blended hydrogen	Transition Wick & Thurso SIUs to biomethane	SIU Appendix (SGN-GD3-SD-11)	ca. 15.8	Re-opener NZASP
	Improved access roll-out	Innovation Strategy (SGN-GD3-SD-05)	7.3	NZARD UILOI
	Progress hydrogen blending	Innovation Strategy (SGN-GD3-SD-05)	See Innovation strategy	
Supporting all five environmental priorities	Innovation to support the energy transition (NIA, can be used partly to support innovation for sustainability)	Innovation Strategy (SGN-GD3-SD-05)	1.25	Baseline

Source: SGN

Section A Ambition and objectives of our Environmental Action Plan

19 **Our overarching ambition and objectives** of this EAP are to:

- reduce our business carbon footprint, including shrinkage, in line with a science-based approach;
- improve our environmental impacts and take innovative approaches in collaboration with industry and our suppliers, to enable a transition to a circular economy with less waste, healthy communities and nature across our networks; and
- support the energy transition to net zero through enabling green gases like biomethane and blended hydrogen to be transported in our networks.

20 We are working towards two **long-term targets**:

- net zero carbon emissions by 2045; and
- zero avoidable waste to landfill by 2035.

21 Our **targets and ambitions for RIIO-3** are set within these long-term targets. For BCF we have **an overarching target in RIIO-3 to reduce this by 46% compared to our baseline year** (2019), with a focus on methane emissions. The table shows the absolute emissions reduction over the price control period and the associated percentage reduction for each initiative contributing to this. Please note that shrinkage emissions calculations as per this EAP use Ofgem's provided formula which uses a Global

Warming Potential (GWP) of 25. We suggest updating this to the latest available GWP in the first year of RIIO-3 in collaboration with all other GDNs.

Table 3: Summary overview of targets and activities for RIIO-3

Environmental priority	Target RIIO-3	Activities
1. Net zero business carbon emissions	Reduce emissions from shrinkage by 33% or 211,257tCO2e	In addition to the Repex programme this also includes investment in advanced methane detection, new leakage management, and pressure management technologies, like Digital Platform Leakage Analytics (DPLA) and Intelligent Gas Grid (IGG). This will guide intervention and enable emissions reductions through pipe repair or replacement, as well as support efficient pressure management with positive impacts on shrinkage.
	Reduce emissions from our fleet by 23% or 3,214tCO2e	Switch to a 5-year replacement plan and lease 247 electric vehicles to transition 13% of our commercial fleet to electric. Enable a shift to a company car fleet which is predominantly electric.
	Reduce emissions from our property by 31% or 738 tCO2e	Install roof-top solar PV on offices and depots supported by battery technology. Install LED lighting in our buildings. Insulate our worst performing buildings and install SMART technology to enable energy efficiency.
	Improve our scope 3 data with an aim to be able to set a baseline for future reductions	Reduction of embodied carbon Work collaboratively with industry to reduce the carbon impact of our street works.
2. Supplier partnerships	Minimum of 85% of suppliers (by value) meeting our Sustainable Procurement Code	Work collaboratively with our supply chain to enable practices which reduce our impact on the environment.
3. Circular economy transition	Reduce waste to landfill by 5%	Innovate and work smarter to reduce the amount of waste created in the first place, and drive towards increased reuse and recycling of materials.
4. Protect and enhance biodiversity	Biodiversity Net Gain for our estate, achieving 10% improvement per project	Maintain our biodiversity improvement projects that were established in RIIO-2. We will also explore wider opportunities in the regions where we operate to support nature restoration projects.

5. Support for greener fuels like biomethane and blended hydrogen	Support the transition to an environmentally sustainable low-carbon network, we aim to carry more biomethane than any other network and supply the equivalent of 1,000,000 homes with biomethane by 2031 Progress hydrogen blending in our networks	Evolve and enhance our network and processes to support a transition away from fossil fuel and increase use of biomethane and other green gases delivered to customers.

22 Shrinkage is the largest contributor to our BCF, comprising leakage, theft and our own use of gas. Leakage represents around 94% of shrinkage. While a significant proportion of emissions reduction is an additional benefit from the HSE (Health and Safety Executive) mandated Repex programme, we will commit to reduce our carbon emissions further and we are proposing new, innovation-led activities in RIIO-3.

23 Our focus on addressing shrinkage and reducing our BCF will deliver cost and environmental benefits to customers, and we will support a pathway for green gases to contribute to the national decarbonisation agenda and net zero. It will also set us on a pathway to reduce our carbon emissions by 46% at the end of RIIO-3 and achieve net zero by 2045, which aligns with the internationally recognised Paris Agreement and a science-aligned target for limiting global warming to 1.5 degrees Celsius.

24 Our ambition for biomethane throughout GD3 is to recognise the growing strategic part biomethane can play in allowing our gas network to transition to a decarbonised energy solution. Biomethane will play a pivotal part alongside hydrogen production and other decarbonised energy sources to deliver a safe, viable energy source to meet future net zero governmental targets.

25 We will continue to provide a safe and reliable network platform for biomethane production to reach its market, however rather than react to the requirements of the biomethane industry, we will build upon experience gained over the previous price control periods to provide a proactive environment for continued biomethane connection growth and to sustain existing biomethane plants' capacity requirements.

26 This approach reflects the expectations of our customers and stakeholders, who ranked developing low carbon energy solutions as the second priority for more investment. Customers and stakeholders agree our plans for low carbon energy are going in the right direction and have the right level of ambition. The whole system approach is supported, understanding a range of low carbon energy solutions will be necessary to suit different regions or areas.

27 In support of greening the network we will transport locally produced biomethane to Wick and Thurso SIUs to replace liquefied natural gas supplies. Harnessing green gas will help remote Scottish communities contribute to net zero, for these particular sites it will reduce the overall natural gas use by approximately 71%.

28 Our focus on biomethane has the potential to remove an additional 2.1m tCO2e from our customers' carbon footprint annually from 2031.

29 One activity that can reduce shrinkage emissions is blending hydrogen into the network. While we are readying our network for hydrogen blending, adding hydrogen to our blend is heavily dependent on the activities of National Gas Transmission, and the availability of independent hydrogen production facilities to create the volume of hydrogen needed to inject.

30 In partnering with our supply chain and beyond, we are moving towards more sustainable street works which is at the heart of what we do as a company. Through innovative approaches, we can reduce waste and improve air quality and make other environmental impacts.

Section B Background and context

31 This section provides information about the societal background and the environment we are operating in. It includes the methodology we used to identify and assess our environmental impacts and sets out the five environmental priorities of our Environment Strategy and how these relate to this EAP.

32 The backdrop to our planning for GD3 has changed since we undertook this process for GD2. At the start of GD2, our stakeholders listed biodiversity as a high priority area for us to focus on and make improvements. Biodiversity has since fallen back in favour of activities focusing on cost reductions and efficiencies, reflecting the cost-of-living crisis. However, biodiversity is still regarded as an area that we should focus on, stakeholder expectations remain high, and with clear links between tackling climate change and a thriving nature, it is something which we believe we should continue doing.

33 Stakeholder views on eliminating leaked gas from our networks (leakage) came across even more strongly in our RIIO-3 engagement cycle than for RIIO-2. They expect us to go above and beyond the positive impact of the safety-driven Repex programme on leakage reduction and explore new ways to reduce leakage through innovative approaches and new technology.

34 The political tone has also shifted, with both the Labour and Conservative parties recognising the political dimensions relating to delivering decarbonisation at pace, while consumer cost sensitivity around energy bills remains high. This puts even more emphasis on our work to remove emissions from our network, ensuring its long-term viability as a clean gas delivery system for our decarbonised energy future.

35 Overall customers and stakeholders show positivity towards biomethane as an immediate and proven technology, whilst recognising biomethane is a transition solution until further low carbon energy solutions are widely available. Biomethane is a proven low carbon technology, already in use and that can work with the current infrastructure with no changes needed, reassuring customers that any investment will not be wasted.

36 These considerations have fed into our programme of stakeholder engagement, and we are confident that the work we are proposing in this EAP is fully supported by our stakeholders and our Independent Stakeholder Group. Customers and stakeholders believe new low-carbon energy solutions should be the top priority for more investment given the big questions around how natural gas will be replaced and the need to develop alternative low-carbon energy for homes and businesses. Each activity proposed in this plan is supported with relevant stakeholder insights which can be found in this section (B). The references provided enable easy access for further reading in our Stakeholder Annex.

Methodology assessing our significant environmental impacts

37 As part of our company-wide Safety Management Framework, we operate an Environment Management System (EMS) externally certified to the internationally recognised standard of ISO14001:2015, to ensure we properly identify, assess and manage environmental risk and the impacts of our network and planned activities. The ISO14001 methodology is a core foundation of our Environmental & Sustainability Policy[4] and has guided our activity since SGN was formed in 2005.

[4] This is available on our website: https://www.sgn.co.uk/sites/default/files/media-entities/documents/2024-09/SGN%20Environment%20Policy%20-%202024-25-vFINAL.pdf

38 The ISO14001 standard requires us to provide an analysis of the significant environmental impacts arising from our network activity, identified and managed through an Aspects and Impacts (A&I) register, which quantitively scores our risks and informs how we manage all environmental impacts for the business. These are identified according to:

- potential to cause environmental harm;
- size and frequency of the aspect;
- importance to our stakeholders; and
- compliance with relevant environmental legislation.

39 Our EMS is externally audited annually, assessing our performance against the standard and ensures our significant environmental A&Is are properly identified against our register, appropriately monitored, and that we practice continuous improvement in the management of those aspects.

40 In Table 4 we show how our recently updated aspects are linked to the five priorities of our environmental strategy which have informed the activities included in this EAP.

Table 4: Our significant environmental aspects as per our Aspects & Impact register and how these relate to the five environmental priorities of this EAP

Aspect	Environmental priority
Methane emissions	Net zero business carbon emissions
Carbon dioxide and other greenhouse gas emissions	Net zero business carbon emissions
Unsustainable use of natural resources	Circular economy transition Supplier partnerships
Water pollution	Protect and enhance biodiversity
Production of non-hazardous waste	Circular economy transition Supplier partnerships
Production of hazardous waste	Circular economy transition Supplier partnerships
Loss of biodiversity	Protect and enhance biodiversity

Source: SGN Aspects & Impacts register.

41 The recent A&I review also identified the following opportunities which are clearly linked to our strategy and activities in this EAP:

- support of biomethane, hydrogen, hydrogen blending and other opportunities to support the decarbonisation of the UK energy system;
- installation of renewable energy to support the decarbonisation of our business;
- circular economy initiatives to encourage sustainable use of materials and minimise waste; and

- improvement to biodiversity to support reversal of nature decline.

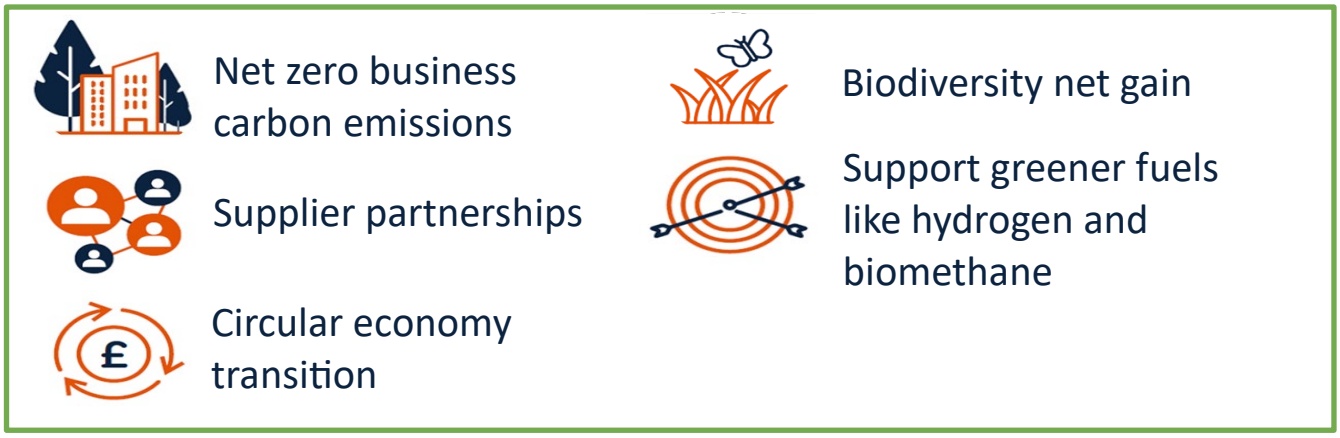
42 At the start of GD2 we established an independent Environment Advisory Panel, and we have been engaging regularly with its six members who provide challenge, support and best practice approaches to environmental and sustainability-related challenges. Our Advisory Panel is a highly expert stakeholder group, whose views and opinions we weigh appropriately against the broader framework of stakeholder feedback which informed this EAP.

Environment Strategy

43 Our Environment Strategy was established for the start of RIIO-2 and focuses on the five environmental priorities which were central to our approach then and remain so now. It remains in line with our stakeholders' priorities as validated through our programme of stakeholder engagement for this EAP. Our five environmental priorities are:

1. **Net zero business carbon emissions:** we will reduce our carbon footprint to net zero by 2045;
2. **Supplier partnerships**: integrating sustainability practices with our supply chain reflecting our own targets on emissions reduction, circular economy implementation, ethical sourcing and innovation;
3. **Circular economy transition**: transitioning towards a circular economy where resources are used, reused, and recycled efficiently and sustainably, minimizing waste and environmental impact;
4. **Protect and enhance biodiversity**: respect and protect the green land we operate on through maintaining the enhancements we made in RIIO-2, to deliver biodiversity net gain on sites we own in the longer term, and to consider wider opportunities to improve nature in the communities where we operate; and
5. **Support greener fuels like hydrogen and biomethane:** we will work with industry and Governments to deliver whole system solutions in support of the transition to a net zero gas network transporting low carbon gases, such as hydrogen and biomethane.

Figure 3: Our five environmental priorities which drive action of our RIIO-2 environmental activities as well as in RIIO-3



Aligning with global goals

44 Our Environment Strategy is aligned with the United Nations 17 Sustainable Development Goals (SDGs). These universal goals are designed to be a blueprint for a more sustainable future and were agreed by world leaders in 2015. They address global challenges around inequality, poverty and climate change, and inform governments, businesses and organisations with 169 targets to incorporate into ambitions and objectives.

45 During RIIO-2 we reviewed and tested materiality towards all 17 SDGs, as is best practice, with key stakeholders including our Environment Advisory Panel and organisations from our supply chain. In this process we have identified six SDGs specifically relating to our business and what we do. These are listed in Table 5 below, along with a brief explanation of why they matter to SGN and our stakeholders.

Table 5: The SDGs that have material relevance to SGN

SDG	Why this matters to SGN
SDG 7: Affordable and Clean Energy	Contribution to energy system decarbonisation: Central heating is responsible for up to a third of the UK's greenhouse gas emissions. We are pursuing opportunities to switch from natural gas to biomethane and hydrogen blending to reduce emissions while still continuing to heat homes safely and affordably.
SDG 8: Decent Work and Economic Growth	Sustainable procurement: Approximately 58% of our carbon footprint (excluding shrinkage) is attributed to our suppliers, scope 3. Through our Sustainable Procurement Code, we are engaging with our supply chain to implement sustainable practices that will help reduce our carbon footprint.
SDG 9: Industry, Innovation and Infrastructure	Innovating for decarbonisation and to protect the environment: The development of new energy carriers, improving energy efficiency, and creating new markets for carbon and other by-products are important focus areas for our business, to apply innovation and support the achievement of net-zero emissions.
SDG 11: Sustainable Cities and Communities	Local environment: We can have a profound positive impact on the quality of life and wellbeing of our colleagues and our communities through improving or restoring the environmental quality and/or biodiversity of sites we own and manage. We are also committed to making our network more resilient to climate change and maintaining our track record of no reportable environmental incidents.
SDG 12: Responsible Consumption and Production	Efficient resource use and circular economy: We are doing more with less 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.
SDG 13: Climate Action	Climate change mitigation: Our biggest environmental impact is our greenhouse gas emissions. We have a responsibility to take action and reduce this to mitigate the effects of climate change.

Source: SGN Annual Environmental Report 2023/24

Past performance – RIIO-2 in review

46 In this section we provide a review of our GD2 performance to date against our RIIO-2 EAP activities. For the full details, please see our Annual Environmental Report[5].

47 The Ofgem-prescribed outputs that we expect to deliver are listed below and all reporting requirements are fulfilled through the Annual Environmental Report:

- licence obligation to publish our Annual Environmental Report every year on our website;
- ODI-R (Output Delivery Incentive – Reputational) on disclosing shrinkage emissions;
- ODI-R for scope 1 and 2 emissions, excluding shrinkage, reporting on actual emissions vs. target;
- EAP Commitments: sustainable resource use, recycling and reducing waste, engagement with our supply chain and how we enhance biodiversity;
- innovation for decarbonisation and to protect the environment; and
- connection of biomethane and other green gases.

48 We do not expect to fully deliver the Price Control Deliverable (PCD) on transition to zero emissions vehicles. Funding not utilised from the PCD will be paid back to Ofgem.

49 We are proud of our progress against targets in several areas. We expect to deliver on our property initiatives and production from our installed solar PV to date is exceeding expectations. We have also completed all our biodiversity surveys and completed 21 improvement projects to date. One of our improvement projects in Oban has won an International Green Apple Environment Award in the category "Environmental Improvement", and "Project of the year award – medium scale" in the BIG Biodiversity Challenge Awards, as well as being commended in the Client Award category recognising the effort and approach taken to establish biodiversity net gain improvements on site.

50 Our key challenges are the transition of our commercial fleet to a zero emissions fleet, and waste management. We are also tracking slightly behind on our shrinkage reductions, compared to our forecast at the beginning of GD2.

51 Table 6 below lists our GD2 EAP KPIs and annual progress since 2022, plus our targets for the final year of the current price control.

Table 6: Performance against our key environmental KPIs

Environmental strategy pillar	KPI	2022/23 actual	2023/24 actual	2025/26 target	Progress
Net zero business carbon emissions	**Business carbon footprint (BCF) (Scope 1 and 2) emissions excl. shrinkage** Reduce by 25% compared to baseline (2019)	19,845 tCO_2e (7% reduction on 21/22)	18,215 tCO_2e (8% reduction on 22/23)	17,395 tCO_2e	
	Shrinkage emissions Reduce in line with shrinkage forecast	696,634 tCO_2e (3% reduction on 21/22)	671,481 tCO_2e (3.6% reduction on22/23	No target – reporting reduction in line with forecast:	

[5] This is available on our website: https://sgn.co.uk/sites/default/files/media-entities/documents/2024-10/SGN-Annual-Environmental-Report2023-24.pdf

				615,813 tCO_2e	
Supplier partnerships	**Suppliers meeting sustainable procurement code** 80% of suppliers meeting Sustainable Procurement Code	85%	85%	85%	
Circular economy transition	**Waste to landfill** Zero depot waste to landfill	4%	6%	0[6]%	
Protect and enhance biodiversity	**Biodiversity studies** Number of biodiversity baseline studies carried out	44	52	Total 102	
Support for greener fuels	**Biomethane connections** Annual addition of low carbon and renewable energy connected to the network (measured in standard cubic metre gas per hour)	0 scm/h	170,689 scm/h	No target specified in scm/h	
	Ambition to have equivalent of 450,000 customers connected to biomethane	255,182	289,620	450,000	

Source: SGN Annual Environmental Reports from years 2022 – 2024. Green progress means the initiative is on track. Amber signifies that progress is delayed but likely to be achievable before the end of the price control period. Red shows that progress against milestones is at significant risk and highly likely to be missed.

Comments on progress

1. Net zero business carbon emissions

52 We are making good progress in reducing our Business Carbon Footprint (scope 1 & 2 including shrinkage). Key to this progress is the reduction of scope 1 shrinkage, which is mainly due to the Repex programme.

53 The biggest challenge relating to our targets for our Business Carbon Footprint has been around our fleet and not meeting our target to transition up to 50% of our new vans to zero emissions where possible, despite our ambition at the outset. In addition to a challenging market with supply chain issues and delivery delays, the type of vehicles required for our fleet and operational model are not yet available on the market. We currently have 25 small vans in our fleet and are trialling larger vehicles to see how these would work in an operational setting.

[6] We acknowledge that we will not be able to achieve this very ambitious target and are renewing our commitment (see section 20 and 182 in the EAP).

54 Fleet is captured in scope 1 (excluding shrinkage). This scope also includes emissions from the gas boilers used across our offices and buildings for heating. Our scope 1 emissions have reduced due to the turbo expander at our St Mary Cray depot being off for maintenance. The combined heat and power (CHP) engine that works alongside the turbo expander is our single largest source of gas consumption. The reduction in scope 1 excluding shrinkage is mainly due to the turbo expander not operating.

55 Scope 2 emissions are from electricity that we procure. Emissions (location based) will reduce over RIIO-2 as we are installing more solar panels and LED lighting systems.

2. Supplier partnerships

56 We are receiving an increased amount of data from our supply chain, which is helping us work towards establishing a scope 3 baseline. We acknowledge we still have a long way to go before we are able to set reduction targets. The majority of our scope 3 emissions come from capital goods, products and services we procure so we are focusing our engagement on providers of goods and services to capture relevant data from them.

57 About 130 suppliers, representing 85% of our suppliers by spend, have taken part in the Sustainable Procurement Code which we published in March 2023. The Code sets out how we intend to engage and collaborate with our wider supply chain and what targets we are focusing on as a company and which, over time, we will put in place for our suppliers and contractors where applicable.

3. Circular economy transition – waste targets

58 We have been working towards zero office and depot waste to landfill since 2013, when we reported that 14% of our waste went to landfill. Our ambition for RIIO-2 was to achieve zero waste to landfill across offices, depots, reinstatement, major projects and gasholder dismantlement for non-hazardous waste by 2026. We are currently performing at approximately 6% waste to landfill[7] and are continuously conducting analysis to identify future areas to focus on to improve our performance.

59 Our very ambitious zero waste to landfill target will not be met by the end of GD2. The challenges with a zero waste to landfill target is that not all waste streams in our society today are able to be reused or recycled.

4. Protect and enhance biodiversity

60 Our overall commitment for RIIO-2 is to ensure no biodiversity net loss on land which we own and manage in the long term. This is being achieved through biodiversity surveys and implementing improvement activities to target longer-term biodiversity net gain. We have completed all 102 baseline surveys we set out to do and delivered 21 improvement projects so far in RIIO-2, with another 22 planned for the current financial year. We will have to continue monitoring for biodiversity net gain, as this is not achieved in a period of just a few years.

5. Supporting greener fuels like hydrogen and biomethane

61 We have been at the heart of biomethane injection into the UK gas distribution network since the first biomethane to grid plant went live at Didcot in Oxfordshire in 2010. We also pioneered the first commercial biomethane to grid facility at Poundbury in 2012 which is still successfully operating in 2024 with plans to expand and increase their biomethane injection rate in GD2. SGN have also been in the forefront of adapting to meet requirements of the biomethane industry in terms of developing biomethane policy and procedures and providing assets to deliver solutions for the biomethane industry.

62 Our strategy to develop biomethane to date has been to provide a responsive, efficient and economic gas network to enable biomethane production facilities to connect to the network in a safe and timely

[7] 6% waste to landfill refers to the amount to landfill across all waste categories (offices, depots, reinstatement, major projects and gasholder dismantlement). Depot waste to landfill is 4%.

manner to meet important government subsidy deadlines. We have 42 currently connected and operational biomethane plants across Scotland and southern England delivering enough connected entry capacity to convey sufficient energy to meet 320,587 domestic customers' requirements.

63 In GD2 we are delivering 10 further projects under a price control delivery (PCD) mechanism to maximise biomethane injection into the network by reducing propane volumes and managing network pressures. This strategy has helped us build a shared net-zero future by increasing the amount of greener gas in our network, forecasted to convey gas to the equivalent of 450,000 domestic households by the end of GD2.

64 Biomethane growth and potential for further growth is still strong and is reliant upon the current subsidy arrangements in place under the Green Gas Support Scheme (GGSS) which has recently been extended to 2028. We fully expect DESNZ to implement a further support scheme for biomethane to extend beyond 2028 to offer continued support for growth in this sector and as a result, forecast increasing demand for network entry capacity across all pressure tiers on our network. SGN needs to be fully prepared and have access to funding mechanisms that are linked to the growth expected that will bring real value to customers and stakeholders.

65 We are progressing our biomethane connection ambitions over the GD2 period with a current connected capacity figure sufficient to provide 320,587 domestic customers with low carbon renewable energy. The ambition to provide 450,000 domestic customers equivalent annual energy is on track to deliver by the end of GD2 with the planned connection of a further fourteen production plants during the remainder of GD2. We have also embarked upon a PCD project to maximise biomethane injection into the network at ten existing biomethane plant locations which centres on reducing the volume of propane required by blending biomethane gas with natural gas on the network to meet charging area calorific value requirements.

66 We recognise the growing importance of biomethane in meeting net zero targets and the requirement to shape the network and associated processes to support this required growth. We are looking to build upon the foundations laid in GD2 around the reduction in propane and pressure control PCD projects to continue this work onward into GD3 to reach a further eight existing biomethane production facilities.

Past performance on biomethane

67 Our historical performance in the biomethane connections market has been strong with a leading position in terms of the number of biomethane plants connected and the volumes of gas injected into the network. SGN have historically been at the forefront of providing the asset infrastructure and policy and procedural mechanisms to facilitate biomethane connections with the first commercial biomethane to grid connection being made in 2012 at Poundbury. Key areas of progress include:

(a) The connection of a further forty-one individual biomethane network entry points to customer timeline requirements following the initial Poundbury connection in 2012.

(b) Four high pressure connections on to our transmission system providing round the clock entry capacity.

(c) The transfer of two biomethane sites from intermediate pressure networks to high pressure to maximise biomethane injection potential.

(d) The development and progression of industry governance arrangements in the Uniform Network Code (UNC) to permit the injection of biomethane via Independent Gas Transporter's networks into the GDN's wider network infrastructure.

(e) The implementation of gas quality Oxygen Health and Safety Executive (HSE) exemptions to permit biomethane plants to inject at pressures above 38barg on our network.

(f) The first GB tanker injection hub to facilitate biomethane injection from production plants remote to the SGN distribution network which currently provides sufficient capacity for four separate

tanker injection deliveries without the need for additional propane to be added linked to biomethane and natural gas blending assets at the facility.

Case study – biomethane facility in Scotland.

Figure 4: Biomethane facility connected to our network in Scotland

Factors influencing the strategy

69 There are a number of factors which will influence the strategy over the coming years including the major governmental heat policy decision in 2026 which will shape the drive towards net zero. The part biomethane will play in supporting the journey towards net zero will mould and shape the SGN strategy moving forward, however the strategy set out in this document will lay the foundations and develop on current successes to provide a firm foundation for biomethane growth moving forward into GD4 and beyond.

Outcomes and Commitments

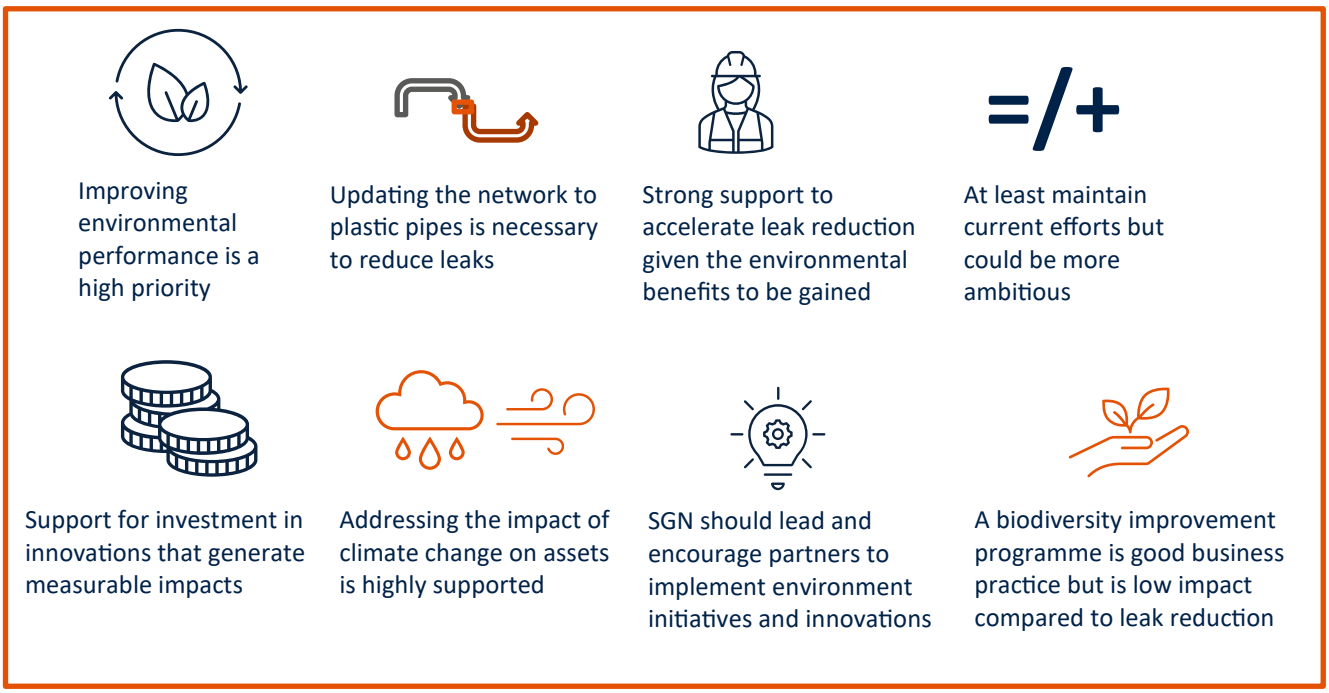
Figure 5 SGN GD3 Outcomes and commitments.

Infrastructure fit for a low-cost transition to net zero	
We adopt a whole-systems approach to delivering net zero	We will contribute to the development of the Regional Energy Strategic Plans (RESPs) and relevant local authority energy plans in Scotland and the south of England
More people will have access to biomethane	We will work collaboratively to maximise biomethane injection and reduce connection times for producers to provide the capacity to transport it to the equivalent of one million homes
Harnessing green gas will help remote Scottish communities contribute to net zero	We will transport locally produced biomethane to Wick and Thurso SIUs to replace liquified natural gas supplies
We will be ready to accept blended hydrogen onto our network to supply customers	We will complete the evidence for hydrogen blending in the first two years of GD3
We will reduce the impact our operations have on the environment	We will reduce our operational carbon footprint by 46% compared with our 2019 baseline with a focus on reducing methane emissions

Customer and stakeholder insights

71 We have held several engagement activities to hear what matters most to our stakeholders in regard to sustainability, the environment, and the future role of our network. In summary, the main findings from our RIIO-3 stakeholder engagement, and discussions with our Independent Stakeholder Group (ISG), are set out in the diagram below. For more information on how this aligns to Ofgem's priorities for RIIO-3, please refer to the Stakeholder engagement and decision log (SGN-GD3-SD-12). Sources provided in the sections below can be found in the decision log.

Figure 6 Summary of stakeholder priorities in RIIO-3.



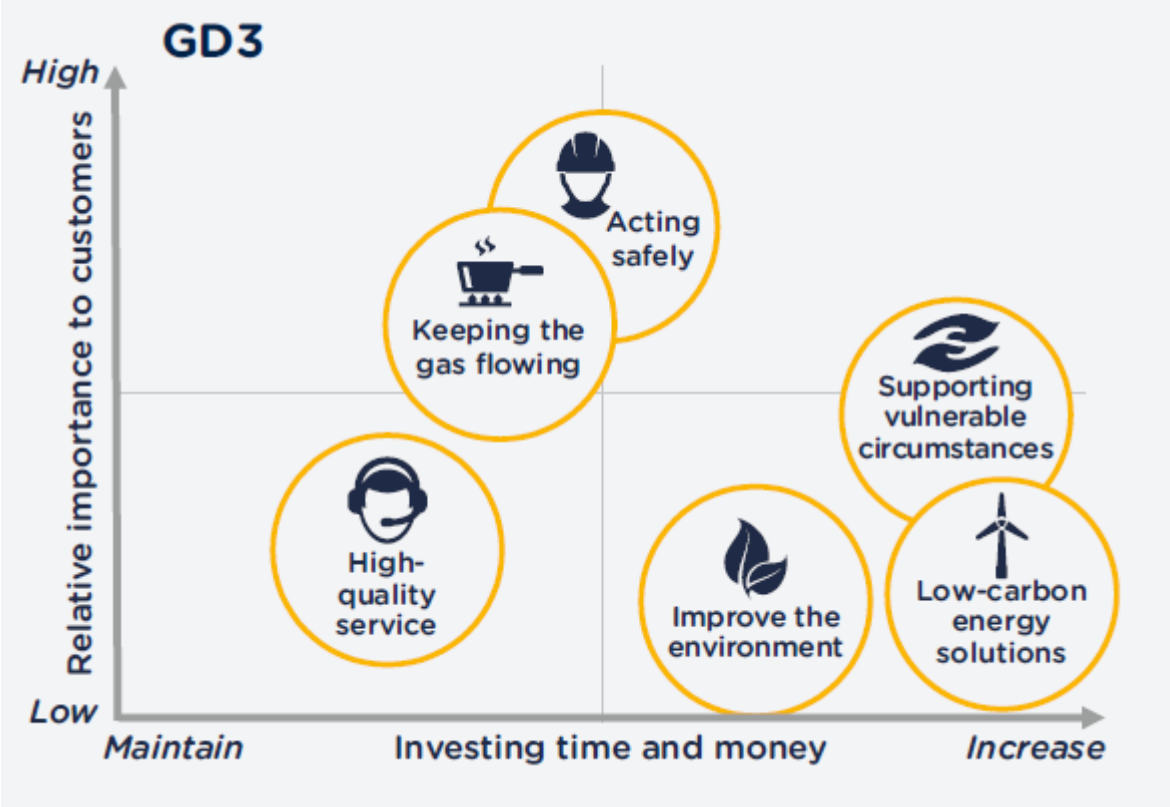
Triangulation for high confidence

72 We have triangulated insights on our customers' and stakeholders' overarching priorities, where they think we should make more investment, and their priorities for the individual initiatives we could undertake in RIIO-3. The triangulation process enhances the validity and credibility of insights and reduces the presence of any bias. By assessing multiple sources of customer and stakeholder insight we can provide a more calibrated and evidence-based approach to the development of our EAP.

73 Throughout our engagement process we used a research agency partner to ensure an integrated and consistent approach to triangulation. For more information about our stakeholder insight methodology, see the Stakeholder Annex.

74 The majority of customers and stakeholders believe improving environmental performance is important with over a third rating it as 'very important'. However, overall customers and stakeholders ranked this in the bottom two of the six priorities (see figure 6), believing it has low impact on customers compared with other priorities. When considered for more investment, improving environmental performance is a high priority and generally ranked third both by customers and stakeholders. Of all the impacts we make on the environment, customers and stakeholders believe reducing gas leaks should be our key focus, with other environmental initiatives having a lower impact in comparison.

Figure 7: Customer and stakeholder input to where we should invest more time and money, showing high appetite for increased investment of time and money in "low-carbon energy solutions"



Transition to green gases

75 The majority of general stakeholders support us in adopting a more proactive and ambitious biomethane strategy. Specialist Future of Energy stakeholders recognise the importance of biomethane and believe we should be increasing its availability. To support biomethane production and usage, producers want the reduction in the requirement for propane, a standardised approach across the GDNs, and government to set targets for biomethane.

76 There are some concerns from stakeholders and customers that biomethane is a stop gap until more sustainable low carbon energy solutions are widely available, and around the scalability of biomethane, with feedstock availability and price acting as a constraint.

77 The GD2 ambition to increase biomethane connected capacity to deliver sufficient conveyed energy to supply 450,000 domestic customers with clean green gas will be taken forward to push towards a greater ambition of enabling 1 million domestic customers, however we recognise that to achieve this ambition the strategy underpinning this ambition must build upon objectives that proactively support sustained biomethane growth and must be supported by Government, Local Authorities and Regional Energy System Planners (RESP).

78 To this effect we will focus on the issues the biomethane stakeholder community have voiced over the GD1 and GD2 price control periods which require a broader vision for biomethane encompassing a standardised approach to biomethane connections, a simpler, more straightforward connections' process focused on the needs of the industry, network provisions to reduce the requirement for propane blending, a timely response to technical issues impacting on biomethane flow rates and a regulatory structure to fund appropriate economic and efficient reinforcement of the network to deliver entry capacity where it is required. The provision of data to the biomethane industry on capacity

location will also be key to allow projects to develop and grow in a more efficient and economic manner.

79 In relation to SGN's remote SIUs, SGN is reviewing the viability to convey two networks in the north of Scotland, compressed biomethane gas (Bio-CNG) which would displace 71% of the existing liquified natural gas (LNG) supply which is currently obtained from the Isle of Grain (for further reading see A biomethane gas solution for Wick and Thurso SIU networks). Developing a Scottish energy solution for these remote networks using biomethane gas produced from a local, sustainable, renewable and low carbon source, would allow these two networks to become the first networks in GB to have a predominantly low carbon renewable gas supply.

Reducing leakage

80 Stakeholders gave "Speeding up replacement of ageing metal pipes with new plastic ones to reduce leakage" strong support, considering gas leaks are responsible for 94% of our environmental impact.

81 Leakage reduction received overwhelming support from environmental stakeholders, as they felt this is the area in which we can make the biggest gains, considering the impact of methane as a greenhouse gas.

82 Informed stakeholders at an environmental roundtable event hosted by us in November 2023 all strongly supported 'accelerating leakage reduction'. Compared to other environmental initiatives, this received the most support because it is our largest environmental impact area. Our EAP includes several initiatives designed to quickly identify and reduce leakage which will have a significant impact on reducing our business carbon footprint. [Sources: 254, 266, 222, 245, 253]

83 Stakeholders at the environmental roundtable overwhelmingly supported more investment due to the urgency of the climate crisis. They strongly supported reducing gas leaks (as did other stakeholders and customers) and in addition, supported reducing our business carbon footprint, due to the potential to make significant gains as well as influencing the supply chain on environmental improvements. [Source: 253]

Additional Repex

84 Speeding up the replacement of ageing metal pipes with plastic ones would increase the beneficial impact of reducing the environmental impact of gas leaks, which make up 94% of SGN's carbon emissions. We therefore asked customers and informed stakeholders if we should do more.

85 Customers and informed stakeholders agreed that investing in non-mandatory Repex work should be a priority for more investment due to its immediate and positive impact on the environment in reducing gas leaks. They identified the accelerated replacement of old iron pipes with plastic as one of the top three initiatives for investment in RIIO-3. Other benefits were also recognised and valued, including improving safety and reliability, and ensuring the gas network is future proofed for hydrogen, should that become an option for different parts of our networks. [Source: 254, 266].

86 Reducing gas leaks ranked top overall out of the six service features customers were willing to pay extra for. The highest level of support came from domestic customers, with fuel poor customers allocating fewer points to the reduction of gas leaks in comparison to non-fuel poor. However, reducing leakage still ranked in the top two service features that fuel poor customers were willing to pay extra for. [Sources: 316, 266.]

Supply chain

87 Stakeholders were asked about how we can work with our suppliers to reduce their carbon footprint. Overall, this is seen as a lower priority for us when compared with developing low carbon energy solutions. While customers felt reducing carbon emissions from our supply chain is good business practice, it should be considered BAU (Business as usual) rather than a top investment priority. Notably, future energy customers view this as a higher priority than current customers, and we expect to progress our ambition for our supply chain during RIIO-3. [Sources: 245, 254, 266, 253]

Biodiversity

88 Perhaps the most significant shift in stakeholder support for EAP activity from RIIO-2 to RIIO-3 has been for "Increasing biodiversity programme to improve local communities". This area is considered a lower priority by customers and stakeholders as they perceive it as small-scale and low impact, when compared to other opportunities to reduce our impact.

89 Our expert independent Environmental Advisory Panel strongly urges us to maintain and build on our programme to protect and enhance biodiversity. Its view corresponds with advisors working with other aspects of society, who are clear that a more sympathetic and reconstructive approach to natural resources will be critical to manage climate change, food security and water purity in future years. We committed to a RIIO-2 programme to enhance biodiversity and we will continue to work towards Biodiversity Net Gain (BNG) during and beyond RIIO-3. [Sources: 254, 266]

Section C Environmental Action Plan

90 This section of our EAP provides a more detailed breakdown of what we are proposing to deliver in GD3. In each case, we have provided an explanation of what we are proposing and why, the associated costs, expected outcomes and links to other parts of our GD3 business plan submission. Table 7 provides an overview of all the activity we are proposing in this EAP for GD3.

Table 7: Summary of initiatives in the EAP for the RIIO-3 period

Environmental priority	Relevant activities	Cost £m	Funding mechanism
Net zero business carbon emissions	Advanced Methane Detection	12.4	NZARD UIOLI
	Digital Platform Leakage Analytics (DPLA)	50.0	Estimated value (No O/H)/ Re-opener (NZASP)
	Ongoing maintenance of existing pressure management systems (maintaining performance)	11.2	Baseline
	New Remote Pressure Management	11.22	NZARD UIOLI
	Intelligent Gas Grid (IGG)	7.1	NZARD UIOLI
	Transition to zero emissions commercial fleet	Leasing – no capex	Baseline
	Transition to zero emissions company cars		Baseline
	Solar PV	3.49	Baseline

	LED	0.44	Baseline
	Battery storage	0.60	Baseline
	Insulation	1.44	Baseline
	Smart technology	2.15	Baseline
	Improve data capture of indirect emissions (scope 3) with an aim to set reduction target in the long-term	n/a	n/a
	Develop a better understanding on embodied car bon of our infrastructure and identify opportunities to improve	n/a	n/a
	Innovate to reduce operational carbon emissions	Part of innovation for sustainability	
Supplier partnerships	Improving engagement with our supply chain	n/a	n/a
	Supply chain meeting our Sustainable Procurement Code	n/a	n/a
Circular economy transition	Reduce waste	Part of innovation for sustainability	
	Improve reuse and recycle and aiming for zero waste to landfill in the long term	Part of innovation for sustainability	
Protect and enhance biodiversity	Maintaining our estate to deliver long-term biodiversity net gain	n/a	n/a
	Consideration of wider opportunities in the communities where we operate	n/a	n/a
Support for greener fuels like biomethane and blended hydrogen	Improved access roll-out biomethane	7.3	NZARD UIOLI
	Transition Wick & Thurso SIUs to biomethane	ca. 15.8	Re-opener NZASP
	Progress hydrogen blending in our networks	25.8	Various mechanisms (see Innovation Strategy)
	Innovation to support the energy transition (NIA, can be used partly to support innovation for sustainability)	1.25	Baseline

Source: SGN

1. Net zero business carbon emissions

91 **Our target by the end of RIIO-3 is to achieve a 46% reduction in our operational business carbon footprint (scopes 1 and 2 including shrinkage) from the 2019 baseline**, with a focus on reducing methane emissions. This reduction will ensure we are on track towards our net zero by 2045 target.

92 Verified science-based targets are not possible today as SBTi[8] cannot approve any targets from the oil and gas sector as the methodology is still under development. Our preference is to adopt a verified net zero science-based target when this becomes available.

Table 8: Proposed activities in RIIO-3 to meet our 46% CO2e reduction target

Activity	Summary description	Carbon reduction in RIIO-3	RIIO-3 cost £m
Shrinkage			
Repex	Replacement of old metallic pipes with Polyethylene pipe (PE pipe) in support of the HSE mandatory replacement programme, this also includes additional non-mandatory Repex	23% of shrinkage emissions or 140,856 tCO2e	Not included in EAP
Advanced Methane Detection	Advanced methane monitoring to cover the equivalent of up to 100% of the network for the five years of RIIO-3 to identify priority areas to remediate leaks	8% of shrinkage emissions or 49,265 tCO2e	Circa 12.4 – NZARD UIOLI
Ongoing maintenance of existing pressure management systems	Our pressure management systems are critical tools that ensure optimal pressures are maintained on our largest low-pressure systems to minimise leakage from the network without interrupting system performance for customers.	Maintaining performance	11.2 – baseline
New Remote Pressure Management	Continued roll-out of remote pressure management systems in South London and South East	2% of shrinkage emissions or 13,300 tCO2e	11.22 – NZARD UIOLI
Digital Platform for Leakage Analytics (DPLA)	DPLA is an innovation project being trialled in RIIO-2 that will increase visibility of above and below ground leakage, and which we propose to fully implement during RIIO-3. The initiative enables identification of emissions reductions through real leakage analytics.	n/a	Circa 50 (No Overheads applied)–Re-Opener

[8] SBTi is the Science Based Target Initiative, an independent body which develops methodology and provides verification for science-based net zero targets.

IGG	Intelligent Gas Grid (IGG) that uses AI to monitor and predict the gas network demand and have a positive impact on leakage and biomethane feed-in, through proactive pressure management.	1% of shrinkage emissions or 8,106 tCO2e	Circa 7.3 –NZARD UIOLI
Fleet			
Retiring vehicles after 5 years to modernise the fleet and increase EVs	Transitioning to a 5-year replacement programme in RIIO-3. Forecasting 247 EVs by the end of RIIO-3, and remainder as new diesel.	19% or 2,739 tCO2e of fleet emissions	Leasing of EVs which does not incur capex
Company cars to full EV	Most company cars are expected to be electric at the end of RIIO-3.	3% or 475 tCO2e of fleet emissions	
Vehicle telematics	Using telematics with integrated cab-cams to drive an incentive plan for operatives to improve driver behaviour to increase driving efficiently, reduced wear and tear, thus saving on emissions and particulates in the air.	Emission savings through more efficient driving can't be quantified	1.22
Property, buildings			
Solar PV microgeneration and battery storage	Direct-feed solar panels are fitted on buildings with existing solar PV and on new buildings, focusing on those which are freehold, plus installing battery storage at main locations.	20% or 466 tCO2e of property (electricity) emissions	4.65
Energy efficiency	Insulation, LEDs and Smart Tech	11% or 272 tCO2e of property (electricity) emissions	4.01

Source: SGN

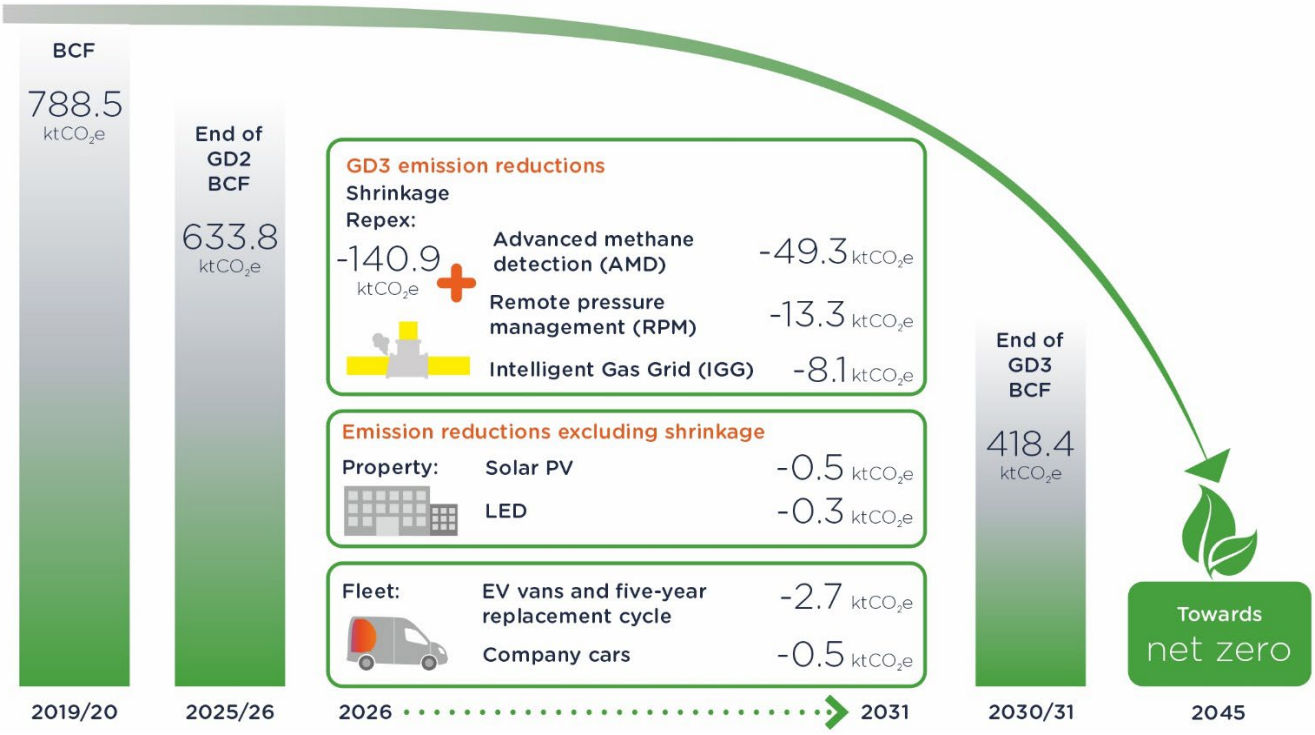
93 Our Business Carbon Footprint (BCF) is expected to move towards net zero emissions by 2045 if we take all the actions suggested above. In particular, the impact of the various shrinkage interventions will make a sizeable contribution, i.e. Repex, Advanced Methane Detection (AMD), new Remote Pressure Management and Intelligent Gas Grid (IGG). **Our target by the end of RIIO-3 is to achieve a 46% reduction in our operational business carbon footprint (scopes 1 and 2 including shrinkage) from the 2019 baseline**, with a focus on reducing methane emissions.

94 All initiatives including Repex workloads would have to be agreed with Ofgem for the expected emissions reduction. The AMD project and IGG also come with a high level of uncertainty for estimated emissions reductions. AMD has been estimated based on experiences using the technology in other countries and IGG is still a SIF project which means our predictions are uncertain.

95 Further, today our shrinkage emissions are calculated using the Shrinkage and Leakage Model (see Repex). Interventions like AMD will only be accounted for when we move to using new technology, like the Digital Platform Leakage Analytics suggested in this EAP (Digital Platform for Leakage Analytics). We

will however report all leakage (both as calculated through the model) and real leakage in our Annual Environmental Report.

96 Figure 7 shows all of the GD3 initiatives that will contribute towards our aim of a 46% reduction of our Business Carbon Footprint (BCF) over the RII0-GD3 period as well as their individual contributions to the BCF per initiative.



97 Each of the initiatives detailed within Figure 7 are required to be supported through the individual funding mechanism detailed in Table 2 in order for us to meet our aim of a 46% reduction of our Business Carbon Footprint over the RIIO-GD3 period.

Shrinkage

98 Shrinkage is the loss of gas from our networks, through leakage and unplanned escapes, our own gas use, and theft of gas from the network. Leakage forms approximately 94% of total shrinkage, which in turn contributes 97% of SGN's carbon footprint. It is largely a consequence of older iron mains pipes that have been in service for many decades. Replacement of old metallic pipes and the control of average system pressures are two key enablers for reducing shrinkage environmental emissions.

99 The Climate Change Act 2008 (2050 Target Amendment) Order 2019 introduced a target for a 100% reduction of greenhouse gas emissions (compared to 1990 levels) in the UK by 2050, the definition of the UK net zero 2050 target. Additional targets were also agreed upon at the COP 26 conference in Glasgow when world leaders signed the Global Methane Pledge to reduce methane emissions by 30% from 2020 levels, by 2030, so it is imperative that SGN and other GDNs actively seek methods with which to control and limit network leakage.

Repex

100 To date, shrinkage reduction has largely been achieved through the management of pressures on the Low-Pressure system and through the mandated Iron Mains Replacement Programme. The replacement programme and expenditure (Repex programme) cover the replacement of existing iron mains as mandated by the Health and Safety Executive (HSE), as well as the work that is undertaken to replace corroding steel pipes, and the refurbishment or replacement of steel riser pipes supplying multi-occupancy buildings. It has a focus on tier 1 pipes, i.e. 8 inches diameter and below[9]. Shrinkage is currently reported through a theoretical model (Shrinkage and Leakage Model – SLM) largely based on actual measured leakage rates conducted through the 2002 National Leakage Tests. This safety-driven 30-year programme of work has the added benefit of significantly reducing methane emissions from leaks coming from the old iron pipes, by replacing them with new polyethylene (PE) pipes that have an 80-year life, and which virtually eliminate leaks where they are fitted.

101 We expect that at the start of RIIO-3, 80% of our 72,161km network will have been converted to PE, replacing at a rate of around 985km per year. We are planning for close to 90% of the network to be PE by the end of RIIO-3. This replacement programme and related expenditure are written up in our RIIO-3 business plan, under our Network Asset Management Strategy.

102 In RIIO-3 we forecast to replace 4,916 km of pipe with new Polyethylene pipe (PE pipe), reducing our emissions by 23% or approximately 140,856 tCO2e over GD3.

Table 9: Estimated emissions savings from Repex workloads

Activity	KPI	Total RIIO-3 BCF reduction	Total RIIO-3 cost (£m)
Repex (tiers 1 - 3)	4916 km pipe replaced	140,856 tCO_2e	See Asset Management Strategy
Further reference	Asset Management Strategy SGN-GD3-SD-06		

Source: SGN analysis

103 It is important to note that the Repex workloads proposed include workloads across tier 1, 2 and 3. This therefore goes above the mandatory Repex programme (which would only deal with tier 1 pipes) and it does so as pipes are being replaced following reviews of the condition of our networks (such reviews are an ongoing process). The additional environmental benefit has been included above, and our emission savings are approximately 4% more than had only the mandatory tier 1 replacement taken place.

104 We also have an opportunity to roll-out new technology across our networks which would help to reduce emissions associated with gas escapes and repair works. We will work on rolling these technologies out to enable our ambition of net zero street works.

Enabling further reduction of shrinkage

105 Our strategy in the EAP is to go above and beyond the clear positive impacts of the planned Repex programme, by seeking out new and different ways to run our network to reduce leakage and improve leakage management further, through:

- Advanced Methane Detection;

[9] The three tiers of pipe diameter are: Tier 1: 8 inches and below (approximately 80% of all 'at risk' iron pipes) Tier 2: above 8 inches and below 18 inches (approximately 15% of all 'at risk' iron pipes) Tier 3: 18 inches and above (approximately 5% of all 'at risk' iron pipes). Source: Health & Safety Executive website.

- Ongoing maintenance of existing pressure management systems;
- New Remote Pressure Management in South London/South East;
- Digital Platform for Leakage Analytic (DPLA); and
- Intelligent Gas Grid (IGG) which provides leakage reduction benefits through efficient pressure management.

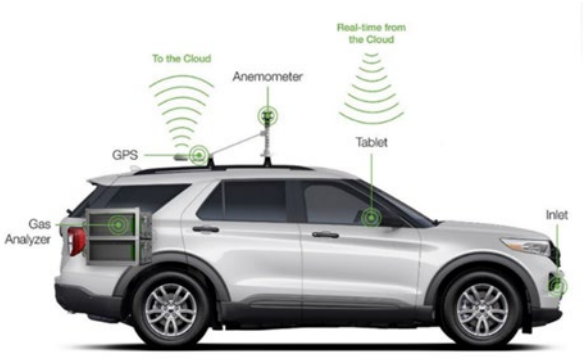
106 Each of these initiatives are explained in more detail in the following sections.

Advanced Methane Detection

107 Our plan includes funding for the equivalent metallic pipe length of up to 100% of our network (approx. 72,000km) to be surveyed for methane leaks via specially adapted vehicles over the five years of RIIO-3. This will help us identify the most significant leaks on our network. Fixing any significant leaks identified through this technology could potentially be approached through the net zero re-opener/ or UIOLI.

108 The funding would provide equipment, staffing and surveys to accurately locate and evaluate volumes of low-level leakage from below ground mains assets.

109 Using Advanced Methane Detection would fully support the development of our leakage reduction strategy, pipe replacement optimisation, a reduction in public reported escapes and improve risk reduction and monitoring. We are collaborating with Cadent to learn from their experience in using this technology which will help us to optimise its roll-out on our network.



110 A UIOLI allowance could potentially be applied for any repairs identified through the Advanced Methane Detection programme. In relation to joint repairs identified through the methane detection programme, SGN would look to use emergent technology and innovative techniques, such as STASS, to streamline the repair process and therefore reduce the time between detection and remediation.

111 This technology has the potential to both inform and accelerate leakage reduction strategies across the UK networks, enabling a proactive approach to finding and repairing more leaks and facilitating a viable pathway towards net-zero operations.

112 We estimate an emissions reduction of up to 8% of shrinkage emissions from using advanced methane detection technology, or approximately 49,265tCO2e, over the RIIO-3 period. This is based on the use of this technology in other countries and therefore comes with a high level of uncertainty.

Table 10: Summary of KPIs for Advanced Methane Detection

Activity	KPI	Total RIIO-3 BCF reduction	Total RIIO-3 cost (£m)
Advanced methane detection	Equivalent length of SGN network surveyed	49,265 tCO2e	12.4
Further reference	Advanced Methane Detection EJP (SGN-GD3-EJP-DST-001), CBA (SGN-GD3-CBA-DST-SOU-001)		

Source: SGN analysis

Ongoing maintenance of existing pressure management systems

113 Our pressure management systems are critical tools that ensure optimal pressures are maintained on our largest low-pressure systems to minimise leakage from the network without interrupting system performance for customers. Continuing to maintain these systems is fundamental to our drive towards net zero. Funding is required to continue the current programme of maintenance and replacement workload in RIIO-3 for profiling and logger equipment (used to efficiently control network gas pressures), along with necessary funding to maintain the operation of the Remote Pressure Management Electronic Actuator sites and the new systems and power sources required to operate the 4G communications services following removal of Wholesale Line Rental (WLR) services.

114 4G networks remotely control governor settings and avoid in-person site visits to carry out manual pressure adjustments of pressure regulating equipment. The requested funding will enable a maintenance programme and workload equating to an estimated 21,900 interventions across RIIO-3.

115 Failure to maintain this programme would result in pressure management systems eventually failing, with an associated rise in outlet pressures at Pressure Reduction Installations (PRI) across all our sites. Average System Pressures (ASP) are a key element of the mains leakage calculation within the Shrinkage and Leakage Model (SLM), and the significant increases in pressure associated with failed pressure management systems could increase our reportable leakage by approximately 34.6 GWh per annum (42,435 tCO2e/annum) as systems would be placed on a constant / seasonal setting.

Table 11: Summary of carbon emissions reduction and costs in RIIO-3 for pressure management maintenance

Activity	KPI	Total RIIO-3 BCF reduction	Total RIIO-3 cost (£m)
Pressure management maintenance	100% system availability	Ongoing maintenance will not provide any new emissions savings but will ensure we maintain what was achieved in GD2.	£11.2
Further reference	Pressure Management Maintenance EJP SGN-GD3-EJP-DST-010		

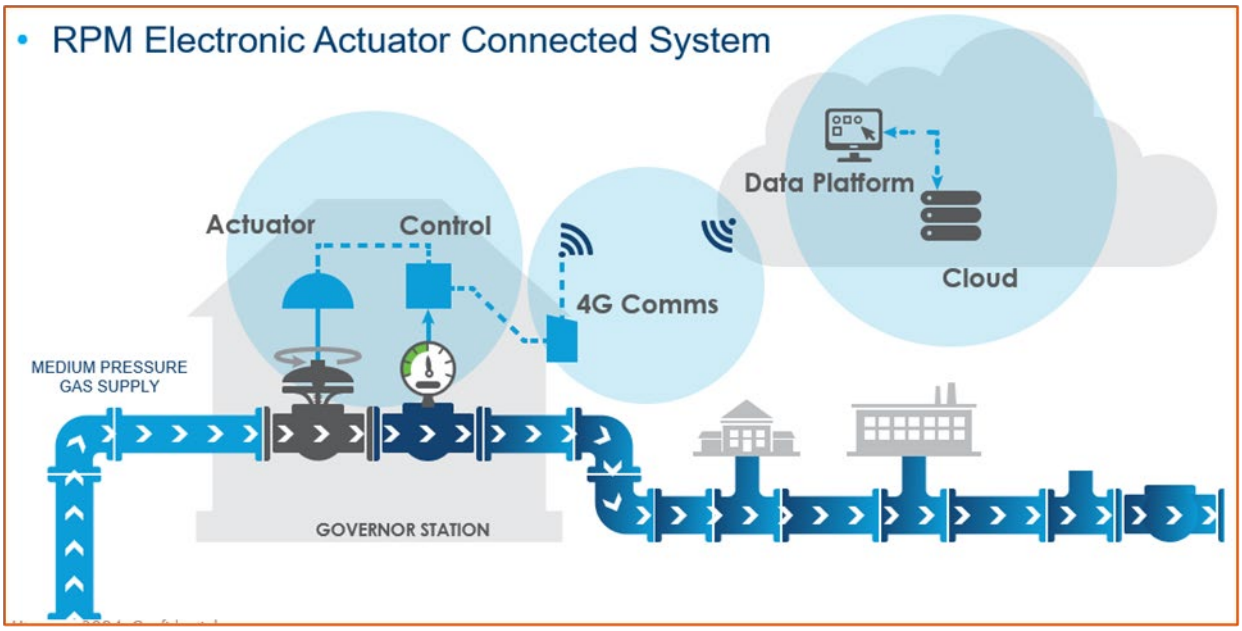
Source: SGN analysis

New Remote Pressure Management – South London/South East

116 In GD2 we successfully installed remote pressure management equipment on district governors (DGs) in the Southern Local Distribution Zone (LDZ). This will continue to contribute an additional 0.4% annual leakage reduction. Because of its success we now plan to roll it out across our South London and part of our South East networks. In these networks pressures have traditionally been adjusted manually to meet varying annual peak customer demands, which leads to system over-pressurisation during off-peak and night time periods. This initiative would see us apply this efficient pressure management system to remotely regulate pressures in the networks.

117 It is estimated that network pressures on seasonally adjusted networks are higher than necessary most of the time, as they are set manually via governors to ensure sufficient supply on the coldest seasonal days under the 1 in 20-year guidelines. High pressures directly lead to increased methane leakage, so by optimising the pressure, while still maintaining minimum service levels, we can have a significant impact on leakage.

Figure 9: New Remote Pressure Management



Source: SIF IGG Project (Beta Phase).

118 Due to its unique design, the Remote Pressure Management (RPM) Electronic Actuator system would enable the vast majority of South London and South East DGs to be effectively pressure managed. If this proposal does not go ahead in RIIO-3, SGN will continue to see higher leakage volumes than necessary from the largest, mixed material, integrated low-pressure network within our business footprint, equating to approximately 11 GWh across a five-year period.

119 Our proposal is to install the pressure management system on up to 317 DGs within the South London low-pressure network and a further 120 DGs in networks across the South East LDZ. The vast majority of sites within these highly urbanised locations are below-ground units, presenting a variety of engineering and logistical challenges, but we are confident that these can be overcome with the experience gained from the ongoing GD2 project. By reducing average system pressures across South London and the South East, with the installation of the RPM actuators, SGN engineers will gain full control and monitoring of these large integrated networks, with system pressure reductions contributing to meeting the 30% methane reduction target by 2030, set at the recent COP 26.

120 These proposed projects would introduce efficient daily pressure management to maximise methane emission reductions, saving approximately 1.4 GWh/annum (or approx. 1,750 tCO2e/annum) of gas in South London. In the South East, the project would likely see reductions in leakage equating to 0.75 GWh/annum (or 910 tCO2e/annum). We are proposing project allowances of £6.9m for South London, and £1.6m for the South East (excl. overheads).

Table 12: Summary of carbon emissions reduction and costs associated with our new Remote Pressure Management strategy

Activity	KPI	Total RIIO-3 BCF reduction	Total RIIO-3 cost (£m)
New Remote Pressure Management	RPM on 437 district governors on South London Low Pressure Network and South	13,300 tCO2e	11.22

	East Local Distribution Zone		
Further reference	EJP on Remote Pressure Management Strategy (SGN-GD3-EJP-DST-009), and CBA (SGN-GD3-CBA-DST-SOU-009)		

Source: SGN analysis

Digital Platform for Leakage Analytics

121 Digital Platform for Leakage Analytics (DPLA) is a Cadent Gas led, joint Gas Distribution Network (GDN), Strategic Innovation Fund (SIF) project. The GDNs, alongside project partners Guidehouse, a leading data and analytics visualisation consultancy, are engaged in an undertaking to fundamentally re-assess how natural gas leakage from above and below ground assets is detected and calculated, and to improve the granularity of where and how much these assets are leaking. The primary project objective is to enhance and improve on current methodologies, to allow GDNs to better track emissions abatement efforts and optimise maintenance and repair investment to limit and reduce gas network leakage.

122 We are senior project partners within DPLA and are fully committed to supporting the project to a successful conclusion, through consistent, meaningful engagement with all parties, providing detailed expert feedback from across the business, and allowing access to all necessary data.

123 Depending on the final outcome of the ongoing Strategic Innovation Fund (SIF) project, DPLA will potentially use sensors on vehicles, satellites, alongside fixed and handheld sensors coupled with machine learning and AI to enable real-life monitoring of assets (including above ground installations) to better understand where our network is leaking on a 'real-time' basis. Continuous monitoring will allow us to find and address the assets with higher emissions.

124 DPLA is an innovation project underway in RIIO-2, expected to be completed by 2026. Our proposal is to request funding via a UIOLI allowance or Re-opener mechanism to implement DPLA during RIIO-3.

125 The overarching principle driving the development of DPLA, is to eventually supersede the current methodology applied through the Shrinkage and Leakage Model (SLM). The SLM utilises fixed leakage rates, derived from the 2002 National Leakage Tests, to all above and below ground assets at cohort level, to calculate overall leakage volumes across individual formula years. The SLM has proven an invaluable tool in driving reductions in leakage from the UK gas distribution networks over the last 20 years, but it essentially means that even with an all-plastic network, there will always be an associated volume of leakage as plastic pipes will retain an asset leakage rate under SLM methodology.

126 DPLA could enable continuous or periodic monitoring of above and below ground assets, providing the necessary granularity to inform location and volume of individual leakage instances, allowing more targeted operational investments in repair and replacement workloads. This data could enable a more proactive approach to leakage management and abatement, opening a clear pathway to a gas-tight network and a net zero future for the industry.

127 With the project planned to complete at the end of RIIO-GD2, there is a risk that any successful outputs, which GDNs would like to carry forward as BAU throughout the price control period, would arrive too late to affect the GDN Licences and Regulatory Framework. Costs, likely scale of technological deployment, and associated internal resource, are at this stage light on detail and precision, preventing an accurate and evidential business case from being developed for RIIO-3, within the SSMD timelines.

128 As stated above, there are many and varied methane detection technologies that could form the basis of the essential inputs to DPLA, with a wide range of potentially significant implementation costs. The GDNs are as yet unsure of the level of coverage required by DPLA to form a qualitative assessment of leakage volumes within the entire UK distribution network, and this in itself could have considerable implications for project capital and operational costs.

GD3 Business Plan Guidance and SSMD

129 The GD3 Business Plan Guidance document (updated May 2024), Section 4.58 specifically refers to DPLA, and asks GDNs to: 'Commit to reporting on observed measures of leakage alongside the current reporting metrics once leak detection technologies and the Digital Platform for Leakage Analytics (DPLA) become available in RIIO-GD3.'

130 In section 2.55 of the Sector Specific Methodology Decision (SSMD) for RIIO-3, Ofgem states: 'We have decided to fund the rollout of leak detection technologies and to require the GDNs to provide further details on the rollout of the DPLA in their business plans.'

131 We are committed to helping to ensure that DPLA succeeds for all the reasons detailed above, and will, when the technology allows and the funding mechanisms to enable deployment of these methane detection technologies at the necessary scale are in place, commit to reporting observed measures of leakage alongside the current SLM outputs. However, at this stage, it is difficult to commit with any accuracy or authority to a more detailed business case within the RIIO-3 plan.

132 We will continue to support Cadent in developing a hybrid SLM, based on the latest leakage data produced by the DPLA project team, prior to DPLA completion. However, we are not currently in a position to commit to a timeline on when observed leakage volumes from the distribution network will be available at sufficient scale to allow the development of a hybrid, SGN focussed, shrinkage model.

DPLA cost indications

133 DPLA has the potential to transform how GDNs in the UK, record, report, and address instances of leakage from the gas distribution system. We are fully supportive of this exciting SIF project and are holding regular discussions with our project partners to try to determine the necessary detail to allow such a commitment to be made and to inform costs and rollout proposals for RIIO-GD3. Based on the information we currently have, the final project outputs could fall under one of three categories, all with different cost implications:

- Probabilistic Model – High proportion of modelled output utilising minimum of sensor technology. (Lower Cost)
- Blended Model – Higher proportion of in-field sensors to reduce reliance on modelling. (High Cost)
- In-Field Detection Only Model – Solely reliant on 100% in-field detection. (High Cost)

134 Any costs provided at this stage for DPLA, the methane detection technologies it relies on, and the necessary scale of deployment will undoubtedly be subject to change as the project progresses. The proposed funding mechanism would need to be of sufficient scale to facilitate the more wide-ranging of forecasts, and agile enough to allow a swift rollout of the platform and technology once it becomes commercially available.

135 The Cadent DPLA project team has indicated to SGN that the Blended Model approach would be the preferred option for rollout. This strategy incurs higher costs than the Probabilistic Model, due to utilising significantly more in-field methane detection technology and relying less on dynamic modelling. SGN have estimated that a 5-year cost to implement the Blended DPLA Model, based on latest indications, equates to £53m. Adjustments to the project costs have been applied to account for the funding requested for SGNs GD3 Advanced Methane Detection programme. Should Advanced Methane Detection not be funded and rolled out in advance of DPLA, then the overall DPLA costs for Blended Model would rise to circa £65m.

Table 13: 5-Year Project Cost Summary (Blended Model)

Asset	Total Number	% Coverage	Installations Required	Technology	Technology Cost (£m)	Operational Cost (£m)	Total Cost (£m)
Mains and Services	N/A	150	N/A	Vehicle Surveys	32.0	13.5	*45.5
District Governors	7447	7.5	560	Fixed Monitors	4.4	1.5	5.9
Offtakes/PRS	287	100	N/A	Handheld Surveys	0.1	1.5	1.6
Totals					36.5	16.5	53.0

Source: SGN analysis

***Vehicle Survey costs reduced to reflect funding request for Advanced Methane Detection programme**

Table 14: Summary of DPLA costs and KPIs in RIIO-3

Activity	KPI	Total RIIO-3 BCF reduction	Total RIIO-3 cost (£m)
DPLA	Leakage Reduction	Final forecast leakage reductions can only be quantified upon completion of the SIF project	53.0
Further reference	None		

Source: SGN analysis

Note – DPLA costs are an estimate and do not contain uplift for overheads.

IGG – Intelligent Gas Grid (Remote Pressure Management)

136 Intelligent Gas Grid (IGG) is a RIIO-GD2 Strategic Innovation Fund (SIF) project SGN are leading in conjunction with Utonomy and Faculty, a consultant and leader in applied AI technology. It is fully supported by the other UK GDNs. This project is primarily looking to develop an autonomous pressure management solution for below 7 barg systems, utilising Artificial Intelligence (AI) and Machine Learning (ML) to learn from previous demand scenarios, and predict future demand using a data-led approach (weather/temperature forecasts), to further optimise system pressures. This development builds on the work currently being carried out to install the remote pressure management Electronic Actuator system (featuring the Ucontrol, Uconnect, Uscope and Ucloud elements) across networks in our South Local Distribution Zone (LDZ), through a RIIO-2 Price Control Deliverable (PCD).

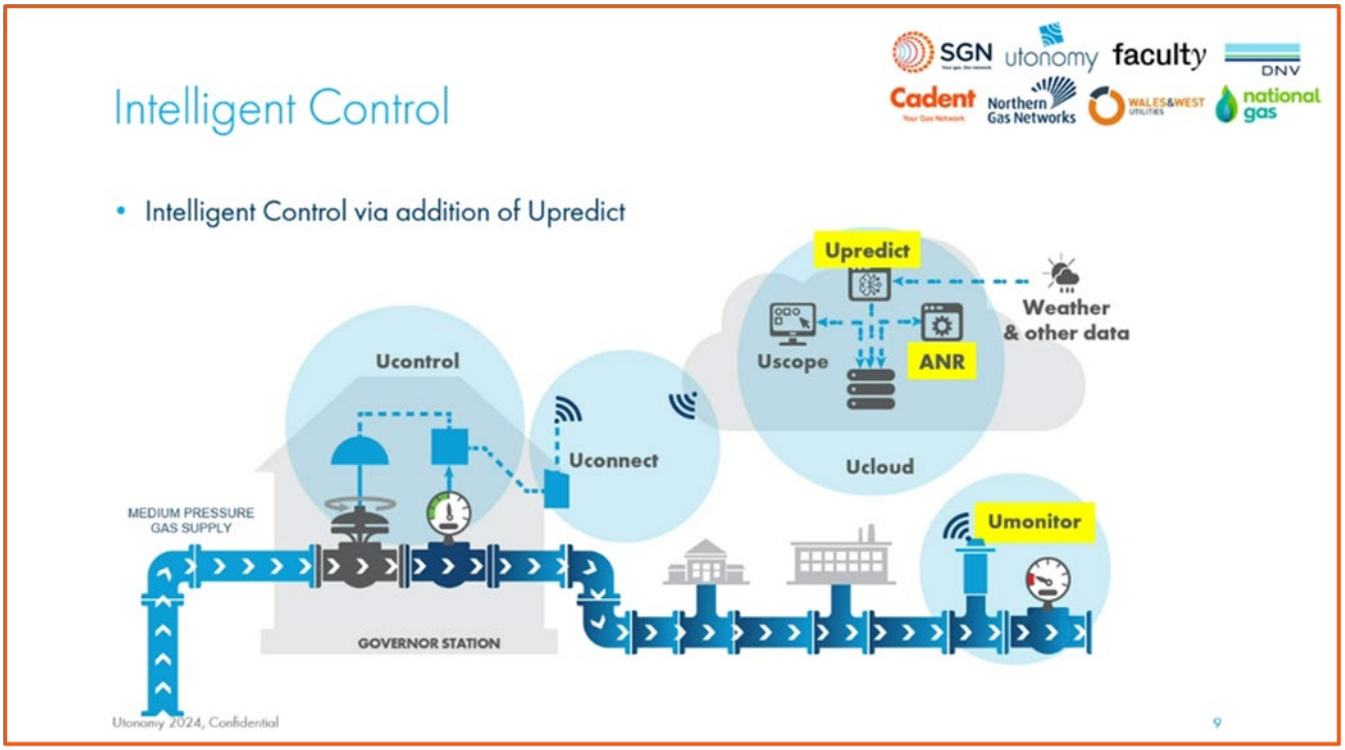
137 The technology autonomously and intelligently (using AI) monitors and controls the network to optimise pressure management and operational planning and maintenance, which can reduce leakage. The ambition for IGG is that it will help us to accurately predict daily demand and network issues through pressure anomalies to optimise pressures further. Furthermore, traditionally, biomethane plants can struggle to inject into the system during periods of low demand. By optimising pressures to maximise biomethane injection rates, we can ensure that our gas mix in the network is as green as possible, reducing the volume of natural gas required.

138 The full funding request is predicated on approval of the RIIO-GD3 Remote Pressure Management project. As part of this RIIO-GD3 submission, SGN would be looking to upgrade the 207 District Governor sites

that were installed with the RPM equipment as part of the RIIO-GD2 Remote Pressure Management PCD project. Should funding be approved for further installations of remote pressure management equipment in GD3, our intention would be to rollout the IGG upgrade on this equipment, in addition to the systems installed in GD2.

139 The AI/ML functions within the platform will assist in further reducing periods of over-pressurisation within low-pressure networks by essentially training an algorithm to detect how each individual system reacts to certain demand levels at certain times of the day/year and will introduce accurate and granular weather and temperature data to predict the optimal pressure set points for the following day through the Upredict system. To ensure security of supply, the project has introduced low-point loggers (Umonitor) and an Automated Network Response (ANR) tool, to ensure governor pressures are increased in the event of a detected low-pressure incident. An image of the proposed system configuration can be seen in Figure 9.

140 IGG is an innovation project underway in RIIO-2, expected to be completed by 2026.



Source: SIF IGG Project (Beta Phase).

141 The project is also looking at two additional distinct workstreams. Faculty are investigating the efficacy of a pressure-based network anomaly detection system, utilising pressure data from the SIF platform, to potentially inform users of abnormal events on individual systems. Having achieved proof of concept, the technology will now be field trialled on our networks over the following 12-month period.

142 It is known that further optimising District Governor pressures to meet expected demand would see correlated reductions in leakage, as per the current mains leakage calculation within the Shrinkage and Leakage Model (SLM). The scale of the benefit associated with this reduction in emissions is entirely dependent on the IGG project scope in RIIO-3. Currently, through the RIIO-2 PCD, we expect to have 265 District Governor sites installed with the Ucontrol Actuator and software, of which 58 of these sites will also have access through Uconnect, to the IGG platform and programming. Therefore, phase 1 of any GD3 project could encompass through the modular system design, an upgrade to the remaining 207 District

Governor sites to be IGG ready. These networks would also require sufficient Umonitor (low point) dataloggers to enable the Upredict and ANR software to function.

143 There remains the potential to expand on the RIIO-2 PCD installation numbers in RIIO-GD3, and this would facilitate a much more significant reduction in leakage, particularly if the South London integrated network is targeted for remote pressure management control with IGG.

144 As the project is planned to conclude immediately prior to the start of RIIO-GD3, there is the potential for overall project costs to change from those submitted within this plan, however the expectation is that costs are more likely to reduce given the current direction of travel from the SIF project. SGN therefore feel that UIOLI allowance is the most appropriate mechanism for this project. Table 17 below, details the likely costs associated with enabling IGG technology on the 265 sites within the GD2 PCD project, and both the proposed GD3 Remote Pressure Management projects for South London (317 sites) and South East (120 sites).

Table 15: Summary of Costs and benefits associated with IGG technology.

Activity	KPI	Total RIIO-3 BCF reduction	Total RIIO-3 cost (£m)
IGG (GD2 PCD)	Leakage Reduction	8,106 tCO2e	3.34
IGG (South London)	Leakage Reduction		4.22
IGG (South East)	Leakage Reduction		1.59
Further reference	Intelligent Gas Grid EJP (SGN-GD3-EJP-DST-006), CBA (SGN-GD3-CBA-DST-006)		

Note – All IGG costs based on one UControl low point logger per District Governor.

Source: SGN analysis

Commercial fleet

145 Our fleet comprises lightweight commercial vehicles (LCVs), repair vehicles with on-board power and plant, and company cars provided to individuals under certain circumstances. The total number of vehicles supporting our networks in RIIO-3 will be 2,133 in our commercial fleet, and another 600 company cars.

146 As noted above in section B on background and context, we have experienced challenges in relation to our transition to a fully zero emissions commercial fleet. Over the course of GD2 the supply chain has not been sufficient to sustain our ambition, the rate of technology progress has not been sufficient to start using it with our heavier goods vehicles and the infrastructure is insufficient to support our critical front-line services. As a result, we are focusing on the conversion of our company cars and small vans where they do not directly involve front line teams. If, during the course of GD3, we can extend beyond this in a cost-effective manner, then we will look to do so.

Table 16: Summary of initiatives to improve our fleet

Initiative	Environmental benefit	Total cost RIIO-3	Funding mechanism

Replacing vehicles after 5 years with EVs and new diesel	Reduced carbon footprint of 2,739 tCO2e (or 19% over GD3)	Covered in Fleet Appendix Leasing model for EVs does not incur capex	Baseline
EV charging infrastructure	Providing charging points at regional depot hubs will facilitate transition to electric vehicles	£1.0m	Baseline
Company cars	Reduced carbon footprint of 475 tCO2e (or 3% of total fleet emissions over GD3)	n/a	n/a
Vehicle telematics	More efficient driving can reduce emissions and decrease pollution	n/a	n/a

Source: SGN analysis

Replacing vehicles after 5 years

147 We are proposing to move from an eight year to a five-year replacement plan for vehicles on our light commercial fleet. This will enable us to bring in more efficient and less polluting new diesel vans quicker than during GD2. In addition, we are proposing to change small vans, that are not critical to frontline teams, to battery electric vehicles, estimating we will have the opportunity to have 295 small EV vans at the end of GD3. The acquisition of EVs will be on a leased basis rather than capital purchase. This will provide reduced environmental impacts and improved air quality.

148 By leasing EVs, we can avoid significant capital investment and reduce the risk of currently unclear factors relating to the EV business model, including residual value, battery life and in-life deterioration.

149 We will evaluate our progress of implementing EVs into our commercial fleet and monitor the rapidly changing situation in relation to the availability of suitable zero emissions vehicles, as well as the growing charging infrastructure. We will continue to collaborate with manufacturers to assess when we will be able to grow our zero emissions fleet further in a cost-effective manner.

150 From 2035, the sale of new liquid petroleum gas, petrol, and diesel vehicles, as well as hybrid vehicles, will be banned across the UK. This is clearly a risk to our vehicle strategy and will be considered when we evaluate our approach. In addition, we have to consider the Zero Emissions Mandate, which obliges a certain percentage of new cars and vans sold on the UK market to be zero emissions. This year, 16% of vans and 24% of cars sold by manufacturers must be zero emissions. There is a fines system in place for the manufacturer for every new vehicle sold that doesn't comply with the mandate. The percentage increases every year, and in 2030 it is 70% for vans and 80% for cars. We are already now having conversations with manufacturers about the Zero Emissions Mandate, as they are wanting both sales and leases to incorporate a number of zero emission vehicles.

Table 17: Summary of carbon emissions reduction and cost of new vehicles replacement strategy in RIIO-3

Activity	KPI	Total RIIO-3 BCF reduction	Total RIIO-3 cost (£m)

Vehicle replacement strategy	1838 new diesel vans	2,739 tCO2e or 19% reduction over the GD3 period (this includes an assumption that a new diesel is more efficient than an old)	See Fleet EJP
New EVs	Opportunity for 295 new small EV vans		Leasing only
Further reference	Fleet EJP (SGN-GD3-EJP-FLE-001), Fleet CBA (SGN-CBA-EJP-FLE-001)		

Source: SGN analysis

Considerations of decarbonising our commercial fleet

151 A large proportion of our fleet are vehicles not suitable for EV due to payload, power offtake needs, and lack of rapid charging infrastructure to work with our operational model. We have investigated hybrid power solutions that could support partial decarbonisation. After considerable review, suitable alternative vehicles are not available at this time.

152 Hybrids are slightly more expensive. They do produce less emissions and could have improved our overall carbon footprint by allowing us to include difficult to decarbonise sections of our fleet. However, hybrid vehicles on the market today are not suitable for our needs for a number of reasons. These include their very limited availability, the size of the space for engineer to work in and the reduction in payloads thanks to the necessary battery and electric running gear.

153 Through our discussions with manufactures, we understand that more options will be available midway through RIIO-GD3, thanks to technical development on the manufacturing side and manufacturers' greater understanding of our needs. Such limited availability of suitable options could also be a consequence of political decision-making and a lack of firm policy around the future of road transport.

154 We have also been talking to manufactures about their plans and timescales for suitable hydrogen vehicles. While the vehicle technology exists today, the significant issue is the lack of re-fuelling infrastructure. We are aware of some manufacturers preparing for larger hydrogen fuel vehicles, which could be suitable for our purposes, to be trialled over the next six months, but these are unlikely to be available at the start of GD3.

155 We will continue to work with manufactures to help them understand our requirements, and should suitable options become available during RIIO-3 we will work with Ofgem and our ISG to consider making a case for a net zero re-opener.

EV charging infrastructure

156 Availability of rapid charging infrastructure remains challenging, apart from in large cities. We have considered home charging alternatives and discharged this as not all employees have a driveway suitable for home charging.

157 We have decided not to install rapid charging points for our commercial vehicles at depots as upgrading our supply to ensure the correct voltage load is brought onto our sites will require significant investment.

158 We have included a proposal of £1m for EV charging at regional hubs. This type of charging will not be rapid and so would be more beneficial to electric company cars, employees own electric cars and any commercial vehicles which can be left at a depot overnight for charging. Further investigation is still required into the local infrastructure, and this may influence our delivery of this objective.

Company cars

159 Our company car policy is to maintain a predominantly electric company car fleet, by having an EV dominant list to minimise the uptake of new hybrid, petrol or diesel cars by employees in the future. This reflects the current ban on the sale of new diesel and petrol vehicles, including hybrid options, currently set at 2035.

160 Employees in operationally critical roles will be provided with hybrid vehicles, reflecting the lack of EV charging infrastructure in the more remote parts of our networks (e.g. SIUs), and our dependency on these individuals to be able to get to where they are needed without delay. Overall, our ambition is for 90% of company cars to be EVs, with the remaining 10% as hybrids for those employees in critical roles.

161 In total **we expect our fleet emissions to reduce by an additional 3% or 475 tCO2e** because of the transition to a predominantly electric fleet of company cars.

Vehicle telematics

162 We will fit all commercial vehicles with technology to monitor and record driving behaviour, using telematics to promote an incentive plan for operatives to improve driving behaviour to increase driving efficiently. More efficient driving could lead fuel savings and reduce wear and tear, thereby also contributing to the reduction of emissions and particulates in the air , as well as costs. While we have been using telematics since RIIO-1, our proposal for RIIO-3 is to upgrade the system in all fleet vehicles with an integrated cab-cam, allowing driver behaviour to be monitored and assessed, to inform future training and driver awareness.

Property (land and building)

163 In RIIO-3 we plan to expand on the property and land initiatives we started and will complete in GD2. This includes the installation of new and additional solar PV (expanding existing locations or installing new roof-top solar

164 at new offices and depots), battery storage, further roll-out of LED lighting, insulation of our worst performing sites and smart technology to enable more efficient energy usage.

165 The initiatives proposed here will make our property locations more energy efficient, less reliant on electricity from the main grid and enable production of renewable energy for our own consumption. **This is expected to result in a total carbon footprint reduction of in total 738 tCO2e, by the end of RIIO-3.** Direct savings for our scope 2 electricity location-based emissions, would come from installation of solar PV and installation of LED lighting. Insulation would save emissions relating to scope 1 (as we own the gas boilers providing the heating) and technologies such as battery storage and smart tech would enable further opportunities of energy efficiency and ensure we can use the renewable energy we produce on our own estate.

166 As the UK grid in general is being decarbonised, and there is a UK Government target for a net zero power grid by 2030, the environmental benefits of installing solar PV and LED lights in particular will reduce over time. By the end of GD3 we could receive the same carbon reductions to our scope 2 if we buy our electricity from the grid as if we were to produce our own renewable energy. However, there are cost benefits and savings to be had with these technologies and hence the initiatives are still worthwhile to proceed with. The emission savings we are showing here are based on the current (2024) carbon conversion factor.

Solar PV microgeneration and battery storage

167 We are proposing to add an additional approximate 1,900kW solar PV generation capacity to 11 existing and new sites and complement this set up with battery storage for the largest locations, four in total, with the biggest electricity consumption. This involves expanding on the solar installations carried out in GD2, which were designed to provide up to 40% of electricity demand at the site, and also installing solar PV at completely new office and depot locations.

168 Installing solar panels across our occupational sites will help reduce electricity costs and increase our self-sufficiency. Battery storage will allow us to use more of the electricity our solar panels produce, for example in a scenario when generation at the weekend is high the electricity can be stored and used during office peak hours in the working week.

Energy efficiency

169 Employee behaviour change is an essential part of reducing energy needs and using fewer kilowatt hours to start with. This includes simple measures, such as reminding our people to switch off lights and equipment, not opening windows when the heating is on, turning down or switching off air conditioners when they are not needed and so on. We will explore different incentives for our employees to make improvements relating to energy reductions. Saving energy has a direct link to saving costs.

170 Our improved efficiency proposal includes the installation of insulation upgrades at our worst performing sites, six sites in total, identified following an audit using the Energy Savings Opportunities Scheme (ESOS).

171 We can further reduce scope 2 across our occupied property estate by installing LED lighting across selected sites which are either new to our portfolio or have not been equipped with these technologies already in GD2. This is the case at 16 sites.

172 In addition, SMART building technology, such as sensors, smart controls and services on demand, will support energy efficiency and enable emissions savings when, for example, lights and other equipment are switched off automatically when not in use.

Table 18: Estimated carbon emissions reductions and costs for property initiatives in RIIO-3

Activity	KPI	Total RIIO-3 BCF reduction	Total RIIO-3 cost (£m)
Solar PV microgeneration	Installed solar PV at 11 locations	466 tCO2e of electricity emissions	£3.49
Battery storage	Battery storage at 4 locations	Battery storage enables own use of zero emissions renewable power	0.60
LED	16 sites with new LED lighting	272 tCO2e of electricity emissions	0.44
Insulation	6 sites with improved insulation	We have not been able to estimate savings for scope 1	1.44
Smart technology	12 sites with installed smart technology	We have not been able to estimate savings	2.15
Further reference	Property Management EJP (SGN-GD3-EJP-PRO-003), CBA (SGN-GD3-CBA-PRO-003)		

Source: SGN analysis

Embodied carbon (scope 3)

173 Embodied carbon is part of scope 3 and relates to all the materials we procure for use on the network or across our business, and the carbon footprint associated with the manufacturing and supply of those products.

174 Our ambition is to work collaboratively with other GDNs, across the industry and with our supply chain to explore how embodied carbon can help to drive reduced environmental impact, increased innovation and reduced cost. Therefore, we commit to:

- collaboratively agree a suitable materiality threshold and a methodology to ensure this brings value to the business, we will do this over the remainder of RIIO-2; and
- work to better understand the embodied carbon in the most common materials and products being used in our operations (e.g. PE pipe and fittings, steel pipe, other gas network equipment, road signs and barriers and PPE) and the challenges and opportunities in reducing their embodied carbon content.

175 While we have not yet set a threshold for new projects that require reporting in this area, we are committing to do so over the next 18 months. This will allow us to dedicate time for further discussions with other GDNs and wider industry (for example the water industry which have made greater strides in this area), ensuring we focus on the right type of projects and that we gather the right data and can make meaningful interventions that drive value for the business and our customers.

176 We are working with Transport for London and aim to trial their carbon calculator for street works in the lead up to RIIO-3. This will help us to identify what the material elements of street works are when it comes to carbon emissions and help support the development of a strategy on how to improve air quality and work towards zero emission street works. Technology and innovation are great enablers of achieving zero emission street works, for example through use of core & vac (coring and vacuum extraction) which reduces waste and saves emissions.

2. Supplier partnerships

177 We use a Sustainable Procurement Code issued to suppliers to govern high standards of environmental management across our supplier community. This was a requirement for RIIO-2, and we commit to ensure our code is up to date and adheres to supplier engagement best practice for RIIO-3.

178 Our work plan over RIIO-3 relating to our supply chain focusses on these areas:

- improve our data capture to cover more than 80% (by spend) of our key goods and services suppliers;
- ensure our Sustainable Procurement Code remains best practice to ensure high standards of environmental management remain embedded in our supplier expectations, and target at least 85% of suppliers (by value) meeting the code;
- collaborate with other GDNs and the wider industry where there are opportunities to develop consistency towards a best practice approach to supply chain engagement;
- continue to engage via Supply Chain Sustainability School, for example arranging regional supplier roadshows to educate and onboard the value of sustainable supply chains; and
- we will request any new key suppliers to register on the Supply Chain Sustainability School.

179 We will continue our RIIO-2 commitment to transparent reporting with supply chain performance included in our Annual Environmental Report.

Improve our data capture from suppliers providing goods and services

180 The purpose of this would be to improve our data collection of scope 3, and ultimately be able to set a baseline for improvements as scope 3 is included in our long-term net zero ambition. Scope 3 emissions represent approximately 58% of our emissions when shrinkage is excluded.

Addressing supplier waste

181 Any targets we adopt would be passed on to contractors where relevant.

3. Circular economy transition

182 Our proposal for RIIO-3 is to:

- target zero avoidable waste to landfill by 2035;
- Reduce waste to landfill by 5% in RIIO-3;
- target an increased amount of recycled and reused materials as a percentage of total measurable materials where feasible; and
- commit to report on actual waste to landfill, recycling and reuse as a percentage of total.

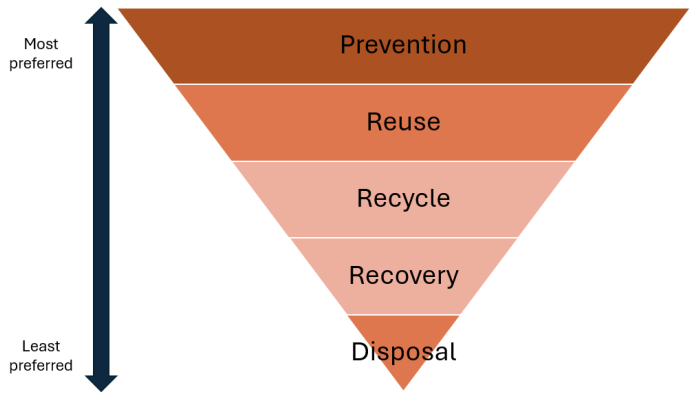
183 We will continue to pursue zero waste to landfill through RIIO-3 to address and reduce waste through our procurement processes, and by embedding Circular Economy principles (which promote maintaining, re-using, refurbishing/remanufacturing before recycling to extend the lifecycle of a product, part or service). The environmental benefits from this approach include:

- reduced requirement for virgin resources;
- reduction in waste to landfill and incineration; and
- reduced risk of resource scarcity and difficulties sourcing key products.

184 Our well established 4Rs strategy (the Repair, Replace, Refurbishment, Rebuild strategy, designed and used to identify the most appropriate action for our asset management, see more in the Network Asset Management Strategy) is a good example of how we are using circular economy principles in practice, to reduce our environmental impact, as well as keeping costs down for consumers.

185 Throughout the price control period we will measure and report on actual waste to landfill, recycling and reuse as a percentage of total waste, according to the waste hierarchy.

Figure 11: The waste hierarchy



Source: Best practice approach for waste management.

186 Through our existing data collection and processes we can analyse and identify where we can make the most impactful interventions when it comes to reducing waste. This is something which we are already starting to do in GD2 and will continue to tackle into the new price control.

187 The UK Government has an overarching aim for zero avoidable waste by 2050 and the Scottish Government goal is to reach a circular economy by 2030. We bear these targets in mind for when we are detailing our road map to zero avoidable waste to landfill and increased amount of reused and recycled materials. **We state a long-term target of zero avoidable waste to landfill by 2035 in this EAP and a reduction of 5% in GD3.**

Depot and Office waste

188 We have been working towards zero office and depot waste to landfill since 2013. Rates of recycling and how much waste gets incinerated are partly dependent on the provider being used. We are currently going through a tender process to engage with a waste management provider to cover all our locations and help achieve our landfill targets. Identifying opportunities for reuse and, as a final resort, recycling, will be a key element of the selection of a suitable new waste management provider. We will publish updates on this process in our Annual Environmental Report.

189 PE pipe is a key material that we procure and use mainly for our Repex programme. Over the first three years of RIIO-2 we have procured 6,881 tonnes of PE pipe, based on our best estimates of volumes necessary for each job or project. Our data show that overall, around 9% of this PE has gone to waste. We are already working towards identifying a KPI that measures the amount of PE pipe procured versus the amount of PE pipe wasted. Improving this ratio will not only save waste that goes to recycling but will also save money.

Recycled material (spoil)

190 Spoil, which includes contractor waste in Repex work, is the biggest waste stream for our business, averaging approximately 300,000 tonnes per year.

191 We will work collaboratively across the gas distribution industry and the wider street works industry to identify ways to improve the use of recycled materials across our networks and drive down the use of virgin material. We will also consider innovative approaches to increase re-use and recycling of spoil.

Non-depot waste

192 Non-depot waste is waste created through specific large projects (Major Projects). This waste category is small and dependent on a specific type of workloads which we expect to decrease into RIIO-3 and beyond. Non-depot waste does not have specific targets, and we will apply the waste hierarchy to any relevant projects.

4. Protect and enhance biodiversity

193 Biodiversity Net Gain (BNG) has become increasingly important in the UK, reflecting growing environmental, social, and regulatory priorities. The UK's biodiversity is in decline due to factors such as habitat loss, urbanisation, pollution, and climate change. BNG aims to reverse this trend by ensuring that any development results in an overall increase in biodiversity, through adopting a proactive approach to conserving and enhancing natural habitats, countering the long-standing loss of species and ecosystems. The UK Government's Environment Act 2021 made BNG a legal requirement in England, mandating that new developments must deliver a minimum 10% net gain in biodiversity, except in exceptional circumstances. It is worth noting that these requirements are not applicable to SGN's work today, and also that the Scottish Government has not set any BNG improvement targets.

194 Biodiversity and ecosystems are recognised for the crucial role they play in managing the impact of climate change and in building resilience. Enhancing biodiversity through BNG can strengthen ecosystems

that contribute to carbon sequestration, flood mitigation, and climate adaptation. Healthy ecosystems are better equipped to withstand adverse climate conditions, making BNG a key component of our approach to mitigating the impacts of our network on the land.

195 Protecting and enhancing biodiversity also brings social and economic benefits and can support the adoption of a shared sense of purpose among employees of companies applying BNG strategies. We have opportunities to promote engagement in projects that protect the environment through our CAP (Community Action Project) Days, which are volunteering days where employees can engage in community projects of their choice.

196 Seeking out new opportunities for protecting and enhancing biodiversity fully aligns with our commitment to UN-SDG 9: Industry, Innovation and Infrastructure - Innovating for decarbonisation and to protect the environment.

197 There is also an opportunity to adopt nature-based solutions in our efforts to adapt to climate change and be climate resilient. You can read more about this in our Climate Resilience Strategy (SGN-GD3-SD-02).

Identified biodiversity improvements

198 We are very proud of our work to date in RIIO-2 on biodiversity, and as mentioned above (Past performance – RIIO-2 in review) we have been acknowledged with awards for our improvements. The aim of our GD2 programme is to establish the existing biodiversity profile on sites that we own and manage in the long term, through a series of surveys and, where appropriate, implement enhancement programmes to increase the biodiversity of the ecosystems existing on them.

199 We have carried out 102 biodiversity studies in total across our two networks, establishing a baseline for improvements. So far, we have completed 21 improvement projects, and we are aiming for another 40, bringing the total to 61 improvement projects over GD2. This is subject to potential operational and other unforeseen constraints. In RIIO-3 we will continue with this programme to enable the measurable 10% biodiversity net gain we are aiming for.

200 In consideration of focusing on customer priorities (see section on Customer insights - Biodiversity) our RIIO-3 programme concentrates on a continuation of works based on initial surveys and improvements, which will involve maintaining sites and with regular intervals surveying how biodiversity changes. We have adopted the DEFRA biodiversity metric tool to help us assess the increase in biodiversity, which will be used to measure improvement on our RIIO-2 improvement projects over time. Our aim is to achieve BNG in the long term, and specifically **we aim to achieve a 10% increase over RIIO-3.**

201 Our ambition in RIIO-3 will protect and maintain the good work we have put in place in RIIO-2 which will enhance and protect the nature we are all relying on as well as creating wider environmental benefits for local communities.

202 Our biodiversity programme focuses on land that we own in the longer term to ensure BNG can be achieved. It is not practically feasible to measure biodiversity improvement on all new connections and network projects and we are not expecting any new connections or network projects that will be of significant size to enable any BNG improvements. For our regular repair and emergency site works we always ensure we reinstate the land to the same standard as it was before our intervention.

203 In GD3 we further commit to explore wider opportunities to enhance and protect biodiversity. We will consider how we can engage our employees, stakeholders, and the wider communities where we operate in such projects. For example, projects could include improvements of natural carbon sinks like peatland restoration in Scotland or wetland restoration in the South of England. It is important to us that any activities we engage with are related to the communities where we operate and that local customers can relate to them.

5. Support for greener fuels like biomethane and hydrogen

204 Biomethane is a no-regrets option for green gas, which we are already actively pursuing. Our ambition for RIIO-2 is to enable the connection of biomethane to our networks to provide a total of 450,000 domestic houses equivalent with green gas by the end of the price control. **We will work collaboratively to maximise biomethane injection and reduce connection times for producers to provide the capacity to transport it to the equivalent of one million homes..**

205 Our Innovation Strategy portfolio includes stakeholder-supported activities for the short, medium and long-term decarbonisation of a whole energy system. Figure 11 gives a brief overview of strategic areas relating to future decarbonisation and sustainability featured in this EAP.

Understanding our consumers' needs		
Understand our consumers' needs and preferences in greater depth and breadth. Maintain strong relationships to support decarbonisation, whilst our assets preserve energy security.		
Today's network	**Network transition**	**Future network**
Responsible investment in research & development that benefits all. • We are more efficient, safe, resilient, and sustainable. • We understand the nature of vulnerability, responding to our customers' needs. • Our customers' energy is decarbonised through a whole systems approach.	**A coordinated whole system approach, delivering carbon reductions for our consumers now.** • Maximise biomethane, greening energy supplies. • Verify, validate, and demonstrate hydrogen blending. • Coordinate decarbonisation solutions for multi occupancy buildings. • Collaborate for a whole system approach to decarbonise the energy system.	**Supporting a low carbon energy transition, a key component of a system transformation.** • Repurpose our assets, supporting the energy system transition. • Understand the impact of network decommissioning for our customers.

Biomethane strategy

206 Our strategy for biomethane builds upon the existing foundations and arrangements to provide a more efficient and economic means to connect to the network. In this changing context of biomethane as a key net zero player, we need to pivot from a position of reacting to biomethane industry requirements to proactively developing our business to deliver the foundations for the next stage of the biomethane growth.

207 Currently we plan to develop our gas networks to meet licence conditions around security of supply through delivering natural gas to meet year-round customer capacity requirements. Whilst this will remain at the forefront of our business into GD3 to maintain a safe and reliable network, the planning and development of the network also needs to pivot towards establishing a platform to accommodate significant growth in the biomethane industry.

208 Therefore, we have identified four key strategic goals underpinning this transition into GD3:

(i) Biomethane gas conveyance will be prioritised over natural gas - we will plan to operate and develop our networks to ensure biomethane gas will always be enabled to flow on to the network as a priority over natural gas. This will include the development of a meaningful target for biomethane growth – actual energy delivered to the network versus potential. Targets reflecting a prioritisation of biomethane over natural gas using existing methods of pressure control settings or where possible new technology to allow the remote management of network pressure settings.

(ii) We will establish dedicated teams in Scotland and Southern networks to (a). operationally support new biomethane gas connections to the network and (b) operationally support existing biomethane connections to ensure they are kept flowing to the network as a priority.

(iii) We will develop throughout RIIO GD3 the regulatory and commercial landscapes to enable biomethane entry capacity to deliver security of supply standards mirroring the existing arrangements for natural gas and focus on reinforcement arrangements to support entry capacity provision.

(iv) We will develop a biomethane gas solution for Wick and Thurso SIU networks utilising locally produced biomethane to partially decarbonise the energy requirement of these networks. We will also focus on the other SIUs to enable low carbon solutions derived from either biomethane or bio-propane. We will implement propane reduction projects and smart pressure control in line with the PCD work we are implementing in GD2. The two LNG networks located at Oban and Campbeltown will benefit from the outputs and learnings flowing from the Wick and Thurso biomethane project. Existing sources of biomethane located on the west coast of Scotland may provide a similar opportunity to implement a reduction in the use of LNG at these locations. The Stornoway LPG network presents opportunities to explore bio-propane.

Biomethane gas conveyance

209 Biomethane gas conveyance will be prioritised by SGN over natural gas - we will plan to operate and develop our networks to ensure biomethane gas will always be enabled to flow on to the network as a priority over natural gas. This will include the development of a meaningful target for biomethane growth – actual energy delivered to the network versus potential. Targets reflecting a prioritisation of biomethane over natural gas.

210 This strategy incorporates an important change in our network operating philosophy which will ensure the prioritisation of biomethane flow rates onto the network over natural gas whilst maintaining security of supply obligations. We have historically operated networks with seasonal pressure settings to maximise the flow of biomethane into the network where possible whilst maintaining security of supply requirements provided for by natural gas capacity. Setting a strategic goal at a company level to prioritise biomethane flow rates over natural gas will not anyway erode these security of supply requirements, however the strategy will cement the importance of maintaining biomethane flow rates wherever possible at a network operational level and from a network planning perspective both in terms of short-, medium- and long-term planning timelines.

211 The tracking of actual injected biomethane energy into the network will also provide a platform to track improvements in biomethane flow rates into the network alongside the existing measure used to identify the potential maximum number of domestic customers supplied with biomethane.

212 To implement strategic goal number one, we need to establish procedures which implement operational controls to dominate biomethane flows over natural gas during periods where biomethane injection may have historically been constrained. This would require an expansion of the smart pressure management regime to address pressure constraints on the network at specific sites but will also require this strategic goal to permeate throughout the business to other areas of operational activity, network planning, network development and policy development.

Establishment of dedicated teams

213 We will establish dedicated teams in Scotland and Southern networks to:

(a) operationally support new biomethane gas connections to the network; and

(b) operationally support existing biomethane connections to ensure they are kept flowing to the network as a priority.

214 The provision of dedicated operational teams in Scotland and Southern who are competent with the intricacies of site specific biomethane injection will support future biomethane connection activity and also support connected biomethane sites to remedy technical faults on SGN assets. This investment in people will provide a foundation to build on our existing technical expertise ensuring the maximisation of biomethane growth moving forward. Forecast growth in this area across GD3 linked to the extension of the GGSS and pending replacement subsidy scheme will require dedicated resources to be made available to support these new connections and support an aging population of biomethane sites.

215 Strategic goal number two will require the establishment of a dedicated team of mechanical and E&I operational engineers in Scotland and Southern to meet biomethane connection requirements over the price control period. In addition, these dedicated engineers will address any issues pertaining to our assets which may constrain biomethane flow rates at existing connected biomethane sites.

Influence the regulatory and commercial landscapes

216 We will develop throughout RIIO GD3 the regulatory and commercial landscapes to enable biomethane entry capacity to deliver security of supply standards mirroring the existing arrangements for natural gas and also focus on reinforcement arrangements to support entry capacity provision.

217 Following our latest stakeholder engagement survey and subsequent meeting, we posed a question relating to the provision of guaranteed capacity being provided by biomethane operators to meet one in twenty capacity requirements required. The responses from the biomethane industry were in support of such a regime which would develop a capacity product to meet our capacity requirements. We would look to develop these arrangements in a UNC Review group to explore the potential for creating a GDN entry capacity regime in this area. This would provide benefits to both the biomethane industry in relation to guaranteed entry capacity and also offer alternatives to GDNs in terms of network capacity in addition to the existing arrangements provided by National Gas Transmission.

218 In GD2 we supported Cadent's development of a GDN entry reinforcement policy to support network reinforcement project costs through a mechanism to effectively socialise these costs across the gas customer base. We understand this process has been submitted by Cadent under a GD2 re-opener submission. SGN will consider the framework and associated rules required to implement a similar arrangement in GD3 should network reinforcement costs be required to facilitate biomethane entry capacity requirements.

219 On strategic goal number 3 we will develop in conjunction with other GDNs and industry partners a UNC Review group to develop the area of distribution entry capacity over the GD3 period. This may also explore the area of securing entry capacity from distribution entry points for security of supply peak demand provision as well as developing the area of guaranteed entry capacity products to enable maximum biomethane gas injection rates.

Biomethane solution for Wick and Thurso

220 We are committed to developing a biomethane gas solution for Wick and Thurso SIU networks utilising locally produced biomethane to partially decarbonise the energy requirement of these networks. We will also implement propane reduction projects in line with the PCD work we are implementing in GD2.

221 Our SIU networks provide an opportunity to decarbonise small areas of our network using locally produced energy from waste feedstocks. The development of two biomethane production facilities in the Invergordon area of Scotland which are currently operational and injecting into the local network at Invergordon provide the opportunity for this biomethane gas to compressed and transported by road tanker to the two SIU networks at Wick and Thurso. SGN have already carried out an initial feasibility study to establish the viability of the proposal and are now undertaking a Front End Engineering Design (FEED) study to establish more reflective costs to refine the GD3 business plan submission for this proposed project which will be included under a reopener mechanism.

222 Strategic goal number four will require significant capex investment to deliver the assets required to implement this objective which are referred to in a separate Engineering Justification Paper. It is envisaged this objective will be delivered under a Net Zero re-opener funding mechanism in GD3. We plan to continue our PCD work into GD3 in relation to increasing the volumes of biomethane in the network by implementing a further eight propane reduction/biomethane blending projects.

223 The successful adoption of bio CNG – Compressed Natural Gas at Wick and Thurso would provide a basis to roll out this greening-the-gas strategy to additional SIUs, either by using the net zero re-opener or by rolling it into our future plans for RIIO-4.

224 There are multiple supply options for bio CNG – Compressed Natural Gas in Scotland, sourced from local distilleries or from farm sites. By adopting a locally sourced bio CNG strategy for all our SIUs we would reduce our carbon footprint through avoiding transportation of LNG across England and Scotland. Our SIU Appendix sets out the proposal in greater detail.

Funding request biomethane strategy

225 To support the strategic goals of GD3 there are a number of initiatives we intend to implement:

(a) Capacity transparency – We will move away from an opaque position on entry capacity location by providing greater transparency via a zonal map solution.

(b) Develop reinforcement policies to deliver entry capacity at required locations through a re-opener mechanism.

(c) Implement biomethane blending as a BAU activity at the initial project planning stage.

(d) Pro-active approach to providing entry capacity – develop solutions to the provision of capacity at customer requested gas entry locations.

(e) Streamline connection process – make simpler and reduce costs associated with this activity.

(f) Align connection process across GDNs where possible.

Table 19: Biomethane funding request for RIIO-3

Programme of Works / Project	GD2 2018/19 prices		GD3	
	Volumes	Cost (£m)	Volumes	Cost (£m)
Southern				
Bio Improved Access Rollout	7	6.05	1	2.7
Scotland				
Bio Improved Access Rollout	3	3.55	7	4.6
SIU's – Wick and Thurso				
Bio CNG – Compressed Natural Gas conversion			2	ca. 15.8

Source: SGN analysis. Estimated costs for bio CNG conversion.

Current impact on carbon emissions relating to the gas we transport

226 Currently we have 42 biomethane plants connected across our Scotland and Southern networks, providing sufficient capacity to supply the equivalent of 320,587 domestic households[10].

[10] Assuming the average household consumes 11,500 kWh of gas per annum, as per Ofgem figures.

227 The contribution of 320,587 customers using biomethane instead of natural gas, equates to approximately 673,000 tCO_2e saving per year.

Impact of biomethane on national carbon emissions from SGN annually by the end of RIIO-3

228 **Our target is to enable the connection of biomethane to our networks to provide a total of 1,000,00 domestic houses equivalent with biomethane by the end or RIIO-3.** The carbon impact would be considerable, saving approximately 2.1million tCO2e every year in comparison with the same number of customers using natural gas.

Table 20: Impact on carbon reductions from the equivalent of 1,000,000 being on biomethane

	Annual emissions by 2031
1,000,000 customers using natural gas	2,103,350 tCO2e
1,000,000 customers on biomethane (targeted equivalent number for biomethane at the end of RIIO-3)	4,398 tCO2e
Total annual CO_2e savings by 2031	**2,098,952 tCO2e**

Source: SGN analysis

Further greening the network – Hydrogen blending

229 During RIIO-3 we plan to introduce hydrogen blending alongside the increase in biomethane, to deliver immediate benefits and decarbonise the energy delivered to homes and businesses.

230 Our focus for hydrogen will be to maximise resourcing and to build the technical capability around system management to allow hydrogen blends safely and effectively on our network. An increase in hydrogen will benefit consumers through reduced carbon emissions and potential cost benefits. Using curtailed renewable electricity production to produce green hydrogen would save consumers the cost of curtailment payments for constrained wind power and provide a stimulus for hydrogen production by using that wasted power for electrolysis. Since 2021 power system congestion has cost consumers over £2bn, with curtailment payments expected to exceed £3.5bn annually by the end of the decade[11].

231 Hydrogen blending, along with increased biomethane entry in our network provides an opportunity for consumer decarbonisation at scale, without the need for some of the costly retrofitting upgrades.

232 A further opportunity could be 100% hydrogen used in parts of our network, promising opportunities to decarbonise different sectors across the energy system.

233 The H100 Fife live trial - delivering locally produced 100% green hydrogen to 300 homes fitted with hydrogen boilers and appliances - has been under development during RIIO-2 and is expected to go live in 2025. Rolling into RIIO-3, the project will establish the performance and social acceptability of hydrogen to provide heating and hot water in real-life domestic settings. The results will feed into national policy decision making relating to the future role of hydrogen for heat, expected in 2026.

234 The ongoing Repex programme has ensured our network is already around 80% PE, so a pathway to decarbonisation which includes hydrogen has clear cost and carbon savings relating to infrastructure, as the delivery mechanism is already in place.

235 Our objective during GD3 will be to continue to evolve and develop a framework to support a strategic free market approach for hydrogen blending in the gas network with an emphasis on technical considerations for optimal network management. We will deliver a network able to accommodate

[11] Reference: Turning wasted wind into clean hydrogen, Policy Exchange (2023), available here: https://policyexchange.org.uk/wp-content/uploads/Turning-Wasted-Wind-into-Clean-Hydrogen.pdf

hydrogen blends safely and efficiently, to reduce carbon emissions, remove constraints around electrolytic production and de-risk hydrogen production at scale in readiness for future demand. Our opportunity for hydrogen blending in GD3 is written up in greater detail in the Innovation Strategy.

Section D Managing risk and uncertainty

236 The EAP has a focus on the five environmental priorities of our Environment Strategy which were implemented in RIIO-2 and stay relevant into RIIO-3. It draws together initiatives and projects from across the business which have significant positive environmental benefit, such as reducing carbon emissions or improving biodiversity on our property.

237 Our progress towards the commitments in this EAP is, and will continue to be, managed, monitored, and reported on internally. This includes highlighting challenges and appropriate mitigations. For our external stakeholders, we commit to reporting on progress in the Annual Environmental Report.

238 The RIIO-3 plan includes innovative technology in the DPLA which is still surrounded by a level of uncertainty. As mentioned in relevant sections above, we will confirm our full approach and associated request for funding before this project is implemented.

239 The emission savings associated with Advanced Methane Detection are based on estimates from experiences in other countries, and therefore come with a high degree of uncertainty. We will monitor this project and report updates on progress and estimates of emission savings in our Annual Environmental Report.

240 We also have to manage the risk associated with a fleet predominantly consisting of diesel vehicles. At present there is a ban on the sale of new diesel and petrol vehicles due in 2035, and we are aware that the current Government is considering moving this forward to 2030. This would fall within the RIIO-3 period and have a direct impact on the composition of our commercial fleet. The Zero Emissions Mandate is also impacting what type of vehicles we can purchase. We are already having discussions with manufacturers in relation to the Zero Emissions Mandate and expect to do so over the remainder of RIIO-2.

241 There are several risks and uncertainties involved with the development of the biomethane industry and the development of wider scale biomethane gas production. These risks include:

(a) future governmental biomethane subsidy scheme durations, rules and price mechanisms which may or may not encourage greater biomethane growth rates;

(b) uncertainty centring on feedstock availability for the expansion of the biomethane industry; and

(c) government policy decisions on the decarbonisation of heat in 2026.

242 Despite these risks and uncertainties, it is clear that biomethane gas offers a creditable net zero solution to decarbonise a percentage of GB's energy requirements and would support the continued utilisation of the gas network asset which has seen significant investment by our customers over previous price controls.

SGN's potential environmental impacts in RIIO-3 without intervention

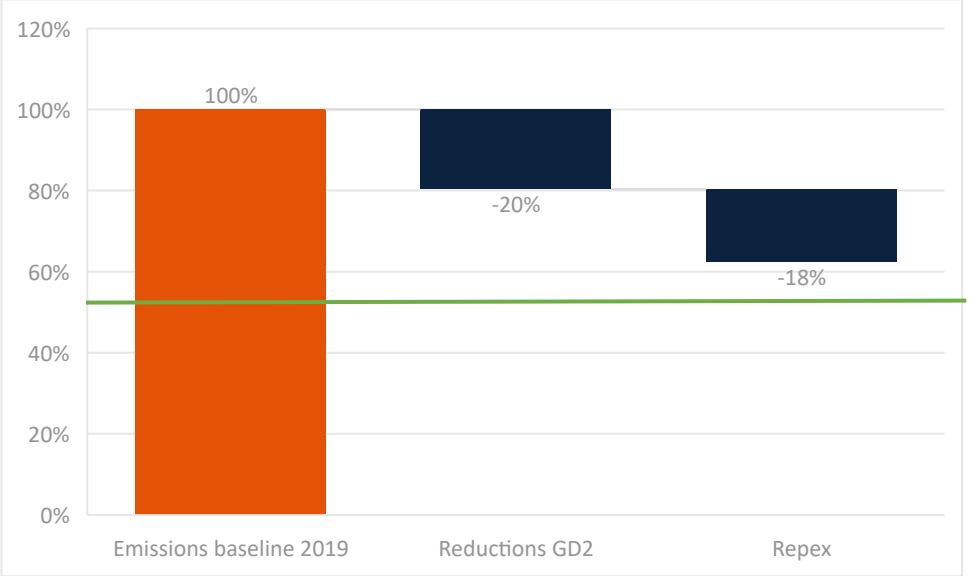
243 SGN's biggest environmental aspect with the highest impact is our carbon footprint, and shrinkage is the largest component of that carbon footprint by far.

244 Without any interventions to reduce carbon emissions from shrinkage we would not be able to meet our ambitious business carbon footprint reduction targets, and would significantly risk adverse reputational impacts, including failing to meet expectations from key stakeholders, shareholders and investors. Emissions would still reduce, but our impact would be limited to the positive benefits arising from the HSE-mandated Repex programme.

245 Emissions related to other sources like fleet, company cars and our electricity and gas consumption are smaller. Excluding shrinkage, emissions from our commercial fleet offer the biggest opportunity to have a positive impact. Having said this, in tackling the climate crisis, action needs to happen across all areas and all scope of emissions.

246 In the Business Plan Data Template for the EAP (M8.17) the lower and upper estimates for counterfactual scenario is disclosed. The graph in Figure 12 shows the impact of no intervention and the gap left between a science-aligned approach of 46% emissions reduction and emissions reduction in a no-intervention scenario. In a no-intervention scenario we would expect the Repex workloads, as described above, (Section C: Repex) would still go ahead.

Figure 13: A no intervention scenario would leave a gap to a science-aligned emissions reduction state represented by the green line in the graph



Source: SGN analysis.

247 As a gas distribution network, we have a critical role to play in the transition of the energy system to a more sustainable whole systems approach in a net zero economy. Decarbonising our own business goes hand-in-hand with our opportunity to support the greater national agenda.

248 In the world today, a responsible company will have to consider not only its greenhouse gas emissions, but also the impact it has on the wider environment and nature. Not acting comes with reputational risks, failure to meet expectations from stakeholders and could ultimately result in the loss of a social licence to operate. Our stakeholder engagement shows that there are high expectations on us to take responsible action to improve our environmental impact.

Section E Engineering Justification Papers and Cost Benefit Analysis

249 The Environmental Action Plan Strategy is supported with six engineering justification papers (EJPs) and cost benefit analysis (CBAs). These documents support our RIIO-GD3 submission for each of the

initiatives detailed within Table 2 of this document and provide detailed Engineering Justifications and costs for investment detailed in this document.

Table 21: EJPs and CBAs supporting our EAP

Name / Project	Value (Sct, £)	NPV (Sct, 16 yr, £)	NPV (So, 16 yr, £)	EJP Reference	CBA Reference
Advanced Methane detection	12.43	13.92	92.48	SGN-GD3-EJP-DST-001	SGN-GD3-CBA-DST-SCO-001 SGN-GD3-CBA-DST-SOU-001
Ongoing maintenance of existing pressure management systems	11.19	n/a	n/a	SGN-GD3-EJP-DST-010	n/a
New Remote Pressure Management	11.22	n/a	3.62	SGN-GD3-EJP-DST-009	SGN-GD3-CBA-DST-SOU-009
Digital Platform Leakage Analytics (DPLA)	50	n/a	n/a	n/a	n/a
Intelligent Gas Grid (IGG)	7.1	n/a	n/a	SGN-GD3-EJP-DST-006	n/a
Property Management EJP	45.09	6.29		SGN-GD3-EJP-PRO-003	SGN-GD3-CBA-PRO-003
Fleet EJP	93.8	71.92		SGN-GD3-EJP-FLE-001	SGN-CBA-EJP-FLE-001

Conclusion

250 This EAP presents the best approach to achieving our key long-term objective of net zero operational emissions by 2045, balancing operational requirements, stakeholder input and the need to reduce emissions. In particular we see great opportunities with the new technology developing in methane management and emissions reduction, and this in turn provides opportunities to tackle emissions in parts of the network which present safety hazards as well as enabling us to have a bigger impact in reducing our operational carbon footprint.

251 We are pleased to be committing to a science-aligned carbon emissions reduction target of 46%. This would bring us well on our way towards Net Zero by 2045 for our scope 1 and 2 emissions including shrinkage. It is a stretching target and one we believe is key for us as a responsible company to deliver on in light of the climate crisis. As noted above there are some uncertainties associated with the target due to challenges in forecasting emissions. We commit to report our progress in the Annual Environmental Report for RIIO-3.

252 We are also very excited about the future for greener gas in our distribution systems. We will work collaboratively to maximise biomethane injection and reduce connection times for producers to provide the capacity to transport it to the equivalent of one million homes. This is a very ambitious target which will have a significant impact for our customers carbon footprint and the transition to a fair net zero economy.

253 Developing our business to pivot towards a positive platform for biomethane development is crucial in meeting Britain's net zero legal targets and ensuring the energy sources are decarbonised. Structuring our business around these strategic objectives will assist in meeting the requirements of the biomethane industry and will allow the biomethane industry to expand and realise the potential also ensuring existing and future connections are sustained. Introducing changes to our business to subtly adjust the emphasis towards biomethane facilitation at this stage will build a platform for the future to transition away from fossil fuel sources of gas over to the renewable sector. Biomethane offers a low regrets and low customer impact opportunity to transition away from carbon intensive fuels over to a true renewable, low carbon alternative which utilises existing assets and infrastructure.

Abbreviations

A&I	Aspects and Impacts
AI	Artificial intelligence
AMD	Advanced Methane Detection
ANR	Automated Network Response
ASP	Average System Pressures
BAU	Business as usual
BCF	Business carbon footprint
BNG	Biodiversity net gain
CAP	Community Action Project
CBA	Cost–Benefit Analysis
CHP	Combined heat and power
DEFRA	Department for Environment, Food and Rural Affairs
DESNZ	Department for Energy Security and Net Zero
DG	District governors
DPLA	Digital Platform Leakage Analytics
E&I	Engineering and installation
EAP	Environmental Action Plan
EJP	Engineering Justification Papers
EMS	Environment Management System
ESOS	Energy Savings Opportunities Scheme
EV	Electric vehicle
FEED	Front End Engineering Design
GD	Gas distribution
GDN	Gas Distribution Network
GGSS	Green Gas Support Scheme
GHG	Greenhouse gas
GWP	Global Warming Potential
HSE	Health and Safety Executive
IDP	Investment Decision Pack
IGG	Intelligent Gas Grid
ISG	Independent Stakeholder Group
KPI	Key performance indicator

LCV	Lightweight commercial vehicle
LDZ	Local Distribution Zone
LNG	Liquified natural gas
LPG	Liquified petroleum gas
ML	Machine learning
NAMS	Network Asset Management Strategy
NRPM	New Remote Pressure Management
NZARD	Net Zero and Reopener Development
NZASP	Net Zero Pre-construction and Small Net Zero Projects
UIOLI	Use it or lose it
PCD	Price Control Deliverable
PE	Polyethylene
PMS	Pressure management system
PPE	Personal protective equipment
PRI	Pressure Reduction Installation
PV	Photovoltaic
RESP	Regional energy system planner
RIIO	Revenue=Incentives+Innovation+Outputs
RPM	Remote Pressure Management
SCSS	Supply Chain Sustainability School
SIF	Strategic Innovation Fund
SIU	Statutory Independent Undertaking
SLM	Shrinkage and Leakage Model
SPC	Sustainable Procurement Code
SSMD	Sector Specific Methodology Decision
UIOLI	Use it or lose it
UNC	Uniform Network Code
UN SDGs	United Nations Sustainable Development Goals
WLR	Wholesale Line Rental
ZEM	Zero Emissions Mandate