

Strategic Performance Overview

2022/23



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1. Strategic Summary

CEO statement

Ofgem's RIIO-2 network price control sets out what gas distribution network companies are expected to deliver for energy consumers from 2021-2026. We made a strong start to RIIO-2 last year and continue to deliver against the plan, creating sector leading services while continuing to develop greener hydrogen options for the future.

It has, however, been a particularly challenging year for our communities, and we are very aware that over seven million people in the UK may now be living in fuel poverty, as the cost of living continues to increase, and energy prices and inflation hit record highs. We have been working closely with the industry and Ofgem to ensure we can do everything to keep our proportion of the gas bill, which presently stands at 13%, as low as possible. Our safe and reliable service is more critical than ever to ensure we keep people warm while protecting the planet for the future.

2022/23 has been the busiest year for emergency calls on record, with a significant increase on the previous year. While it has not been an exceptionally cold winter, the volume of calls has been driven by the wider cost of living and energy cost challenges that have influenced UK customer behaviours. Our experiences this year and our position as the provider of the National Gas Emergency Service for all Gas Distribution Networks gives us a unique perspective. We have seen an increase in energy supplier related calls being misdirected to the National Gas Emergency Service, with our busiest ten days on record in December 2022. We are using this to lead efforts to bring the industry together, respond to changing consumer behaviour and anticipate future requirements.

I'm particularly proud of how our teams worked together in responding to the significant damage caused by water ingress to our gas network in Stannington, near Sheffield in December 2022, affecting over 3,000 homes and businesses in

the coldest period of the year. Our incredible efforts to restore gas to the residents of Stannington was outstanding and delivering our double compensation payments quickly was a much-needed boost to the community. I'd personally like to thank everyone who worked around the clock, battled against ice, snow, and continuous water ingress to get residents back on gas as quickly as possible. It was a monumental effort and the response from the local community was testament to everyone involved.

I'm also proud of the leading role we have taken to support customers in vulnerable situations utilising the Vulnerability and Carbon Monoxide Allowance (VCMA) with ground breaking initiatives such as our Centres for Warmth which we are increasing at scale across the communities we serve. I am pleased that Ofgem have taken the decision to repurpose the fuel poverty scheme allowances to the VCMA which will allow us to support customers living in fuel poverty at an even greater scale. On top of this we continue to leverage the significant investment from our shareholders in the Cadent Foundation to give customers advice and real interventions which create fairer and easier warmth.

Through our business plan we have set Ofgem's defined efficiency benchmark for the sector; we have customer satisfaction scores among the best in the industry; and continue to play a leading role in creating greener, resilient, and affordable options for future energy use through our pioneering hydrogen projects.

We have made strong progress in improving our network resilience, including robust winter preparedness plans and making significant improvements in our cyber resilience. As we drive extensive changes to our data and digitalisation strategy, we've seen impressive action against our plans and some instrumental changes in cyber security and IT resilience.

In 2022/23 we continued our operational transition, transforming our Energy Operation Teams who operate and maintain our critical supply infrastructure. This transformation means that we have ever more multi-skilled and locally based teams, who not only understand the gas network in their area but are wholly focused on ensuring the resilience of the gas supply for their local communities.

Our embedded network operating model continues to deliver, with clear local accountabilities to our teams. We are benefiting from enhanced data, engagement, and insights, which has led to a quicker response to customers and operations.

Our transformation will continue in the year ahead, where we will focus on 'Operations 4.0', our strategic transformation programme, which will review the operating effectiveness of the business as we look ahead to the energy transition. We will be exploring the development of smart networks that utilise targeted asset investment, intelligent network monitoring and proactive leakage detection.



Steve Fraser
Chief Executive Officer



Chairman statement

Our purpose is “Keeping people warm, while protecting the planet”. This reflects both the essential work we undertake on a daily basis to provide a safe and reliable gas supply for our customers and wider communities as well as our journey to achieve our net zero ambitions. Every aspect of the company’s business and operational activities contribute to achieving our purpose.

Our purpose is underpinned by our values: we work together; we take responsibility; we drive performance; we shape the future – and behaviours that support them. These were introduced in 2020 following collaboration across our workforce to ensure that they were relevant to and resonated with our people. The Board has received regular reports and provided oversight and guidance throughout, recognising the importance and benefits of clear and embraced values and culture to the workplace experience.

As with our values and behaviours, our Force for Good Framework, is well established. It sets out our ambition to make a positive social impact for our customers and wider communities in which we work, as well as managing our climate change impact. Our functional plans are developed to support our ambitions of ‘easier warmth’, targeting fuel poverty and providing support for customers in vulnerable situations; ‘fairer opportunities’, focusing on equity, diversity and inclusion, fundraising, volunteering and matched giving; and ‘greener society’, covering key environmental targets. Progress and performance are monitored by the Sustainability Committee, which in turn reports to the Board.

A key role for the Board is to steer and guide development of the company’s strategy and business model to deliver the very best outcomes for consumers and broader society, and generate long-term sustainable value. The company’s business plan for the RIIO-2 price control period was accordingly formulated with the assistance of stewardship and strategic input from the Board. The business plan encompasses the company’s commitments to provide: a resilient network, keeping energy flowing safely and reliably; a quality experience for our people, our customers and stakeholders; tackling climate change and improving the environment; and trusted to act for the benefit of our communities.

In the second year of the RIIO-2 period, the Board’s areas of focus have included oversight of the company’s net zero strategy, which remains essential for the long-term success of the company; early review of plans and preparation under way for the RIIO-3 period; and management of cyber security risks. The Board also reviewed the company’s ambitions in relation to Equity, Diversity and Inclusion initiatives, and work to further enhance Cadent’s culture for the benefit of existing and future employees. As would be expected, the cost of living crisis and the actions available to Cadent to support customers have been recurring subjects for consideration. The Board has carefully monitored and reviewed the company’s response and has been pleased with the steps taken. Alongside areas of focus, the Board retained oversight of operational performance, ensuring that the company was delivering for customers against commitments made and reviewing activities in place to drive continuous improvement.



Sir Adrian Montague CBE
Chairman

2. Performance summary

Output performance summary 2022/23

We met all annual outputs, except for our Emergency Standards of Service in LN and NW, and we plan to meet all our five-year period outputs.

Outcome	Output	EN	LN	NW	WM
Delivering a resilient network to keep the energy flowing safely & reliably	Emergency call handling	●	●	●	●
	Emergency response – Uncontrolled	●	●	●	●
	Emergency response – Controlled	●	●	●	●
	Tier 1 mains	●	●	●	●
	Tier 1 services	●	●	●	●
	NARM	●	●	●	●
	London Medium Pressure	●	●	●	●
	Capital Projects	●	●	●	●
	High rise building plans	●	●	●	●
	GSOP	●	●	●	●
Providing a quality experience for all our customers & stakeholders	ER&R CSAT	●	●	●	●
	Planned work CSAT	●	●	●	●
	Connections CSAT	●	●	●	●
	Complaints handling	●	●	●	●
	Unplanned interruptions – MOBs	●	●	●	●
	Unplanned interruptions – non-MOBs	●	●	●	●
	Collaborative streetworks	●	●	●	●
	Consumer vulnerability minimum standards	●	●	●	●
Tackling climate change & improving the environment	Consumer vulnerability reputational incentive	●	●	●	●
	Shrinkage reputational incentive	●	●	●	●
	Shrinkage financial incentive	●	●	●	●
	Commercial EV Fleet	●	●	●	●

●	Achieved annual output or on target to meet period output
●	At risk of failing five-year period output
●	Failed to achieve annual output or will fail five-year period output

Financial summary

2022/23 (£m, 18/19 prices)	EN	LN	NW	WM
Regulatory Asset Value	3,262	2,330	2,322	1,745
Allowed Revenue	825	582	577	433
Return on Regulated Equity (%)	2.7	3.8	4.3	5.4

Totex summary

During 2022/23 we overspent our Totex allowances by £56m as our investment programme increased further in scale, whilst allowances reduced and inflationary and market pressures impacted the cost base.

2022/23 (£m, 18/19 prices)	EN	LN	NW	WM
Costs	373	281	245	171
Adjusted allowances	326	267	238	182
Outperformance	(47)	(14)	(6.6)	12
% Outperformance	(14%)	(5%)	(3%)	6%
Return for customers	(24)	(7)	(3.3)	6

Output Delivery Incentives

In 2022/23 we achieved a reward across CSAT and Shrinkage incentives in all our networks and a reward for Collaborative Streetworks in LN. We did not pay any penalties for Complaints and Unplanned interruptions. (See [Output Performance](#) section for further detail)

2022/23 (£m, 18/19 prices)	EN	LN	NW	WM
Customer Satisfaction	1.92	0.49	1.65	0.93
Complaints	0	0	0	0
Unplanned Interruptions	0	0	0	0
Shrinkage	0.08	0.16	0.48	0.36
Collaborative Streetworks	0	0.92	N/A	N/A

3. Financial Performance

This year we have spent over £1bn in operating, maintaining and investing in our gas distribution networks throughout the North West, West Midlands, East Midlands, South Yorkshire, East of England and North London. Over the five-year regulatory period we forecast that we will spend over £5bn in bringing gas to 11 million homes, businesses, schools and hospitals across our regions as well as playing a key role in keeping the lights on, through our support of peaking power plants, and facilitating green gas through our 42 biomethane connections. We have continued to focus on the operational improvements and efficiencies to deliver on our regulatory commitments and to minimise the impact of our activities on customers' bills.

Our actual and planned performance is set out in a period of economic and political uncertainty. We continue to face many competing challenges including delivering in an environment of higher costs to attract capital, affordability constraints, attracting and retaining diverse talent in a challenging labour market, security of supply concerns, and delivering decarbonisation. Despite these challenges we continue to deliver strong efficiency and financial performance which is expected to see a real terms bill reduction of £35 per customer p.a. or 22% reduction by the end of RIIO-GD2 compared to start of RIIO-GD1.



Return on Regulatory Equity (RORE)

For RIIO-GD2, we are publishing Regulatory Financial Performance Reporting ("RFPR") in September. We expect RORE on average over the five years to be marginally below the allowed return of 4.97%¹ at a Cadent level, however, this requires continued improvement in customer incentive performance and delivery of stretching efficiency plans. With a volatile economic backdrop, this remains a very ambitious plan.

Cadent RORE	2021/22	2022/23	2023/24	2024/25	2025/26	Average
Allowed Return	4.52%	4.56%	5.28%	5.24%	5.25%	4.97%
Totex	0.7%	(0.7)%	(0.5)%	(0.5)%	(0.1)%	(0.2)%
BP Incentive	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Financial ODIs	0.1%	0.2%	0.2%	0.2%	0.3%	0.2%
NIA Funding	(0.0)%	(0.0)%	(0.0)%	(0.0)%	(0.0)%	(0.0)%
Fines & Penalties	(0.1)%	(0.2)%	(0.1)%	(0.1)%	(0.1)%	(0.1)%
Operational RORE	5.2%	3.8%	4.9%	4.9%	5.3%	4.8%

Table 3.1: Cadent Return on Regulated Equity (RORE) performance by year

	Five-year RIIO-GD2 Average				
	Eastern	London	North West	West Midlands	Cadent
Allowed Return	5.0%	5.0%	5.0%	5.0%	5.0%
Totex	(1.1)%	(0.5)%	0.3%	1.0%	(0.2)%
BP Incentive	0.0%	(0.0)%	(0.0)%	(0.0)%	0.0%
Financial ODIs	0.2%	0.2%	0.2%	0.2%	0.2%
NIA Funding	(0.0)%	(0.0)%	(0.0)%	(0.0)%	(0.0)%
Fines & Penalties	(0.1)%	(0.1)%	(0.0)%	(0.1)%	(0.1)%
Operational RORE	3.9%	4.6%	5.5%	6.0%	4.8%

Table 3.2: Five-year average RORE performance by network

After the Allowed Equity Return, the main driver of RORE is the Totex incentive mechanism. Through the continued delivery of our ambitious programme of organisational transformation we are striving to deliver the stretching ongoing

¹ Operational RORE is calculated in line with RFPR reporting methodology.

efficiencies. These efficiencies are equally a component of our allowances, as such we aim to deliver at a similar level of performance to that achieved in 2022/23 over the remainder of the RIIO-GD2 period.

We are experiencing significant input cost pressures that are not being compensated for through allowances. Mitigating these cost pressures through our transformation programme and rigorous control over expenditure ensure overspend is constrained; and where there is overspend, the risk is split evenly between customers and the company, reducing the bill impact.

There are very few positive Financial Output Delivery Incentives within the RIIO-GD2 framework, however we expect to earn incentive rewards that will contribute a 0.2% RORE over the period through the delivery of improved customer satisfaction and reducing disruption in the road in Greater London.

Revenue and Customer Bills

Allowed Revenue

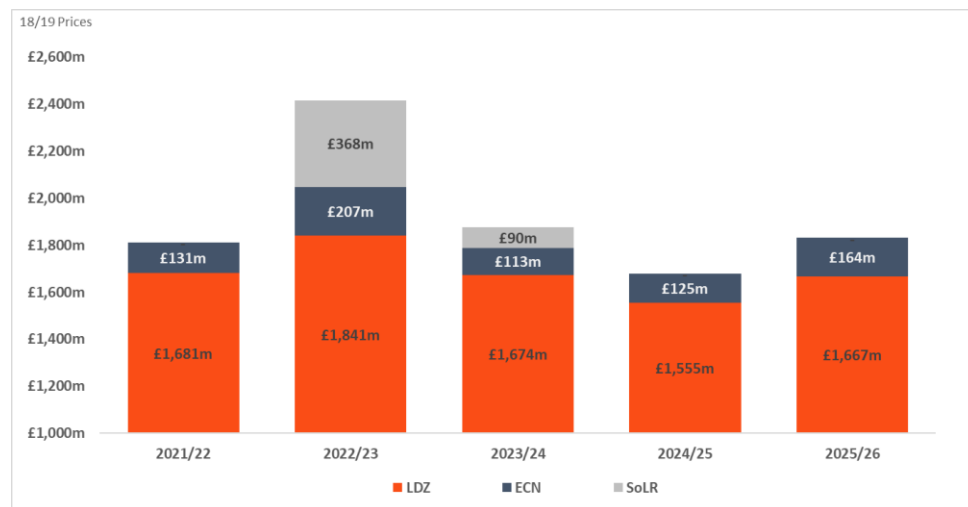


Figure 3.3: Cadent Revenues (2018/19 price base)

At the beginning of the price control Ofgem set revenues based on the Final Determinations which were subsequently amended following a Competition and Markets Authority (“CMA”) appeal. Our Allowed Revenue is calculated each year based on our cost and workload performance and is used to set customer bills. The amount of revenue we collect does not always match the amounts allowed due to changes in customer demand for example. Any under or over recovery is corrected for in future years. Our revenues are made up of three main charging building blocks. Revenues in relation to the provision of the gas network services known as “LDZ” or Local Distribution Zones. We also collect revenue to pay for the National Transmission System (“NTS”) for Exit Capacity charges, and the Supplier of Last Resort payments. The latter are pass through costs to the gas networks as we have limited opportunity to reduce them. They do feature as a large part of the end customer bill, particularly in the year to March 2023, and as such are separately identified in our analysis below.

Network	21/22	22/23	23/24	24/25	25/26
Eastern	614	825	654	570	633
London	443	582	415	405	439
North West	433	577	475	380	431
West Midlands	322	433	334	325	328
Total	1,812	2,416	1,878	1,680	1,831

Table 3.4: Cadent Revenues by network (2018/19 price base)

Our Allowed Revenue in the year to March 2023 is £2,416m and this is forecast to reduce by c. 30% by the end of RIIO-GD2 excluding the impact of inflation largely as we forecast to end charges in relation to Supplier of Last Resort costs, ongoing Totex efficiencies driven by our transformation programme and the reduction in gas prices (only a pass-through item for Cadent) seen recently continues into the longer term.

Customer Bill Impact

The amount each customer pays through their bill is driven by consumption, the Allowed Revenue for the year, changes in the number of customers, and the split of revenues between domestic versus industrial and commercial users. If the number of customers increases, then the amount each customer would pay is less. Our forecast presented below assumes no change in customer numbers and revenues aligned to the efficient expenditure profile included within our forecast. Importantly, shrinkage costs which are a pass through and related to volume but importantly the price of wholesale gas are expected to reduce from reduced leakage following further mains replacement activity and lower unit costs. The impact of inflation is excluded from the analysis with information provided in a constant price base with the current year.

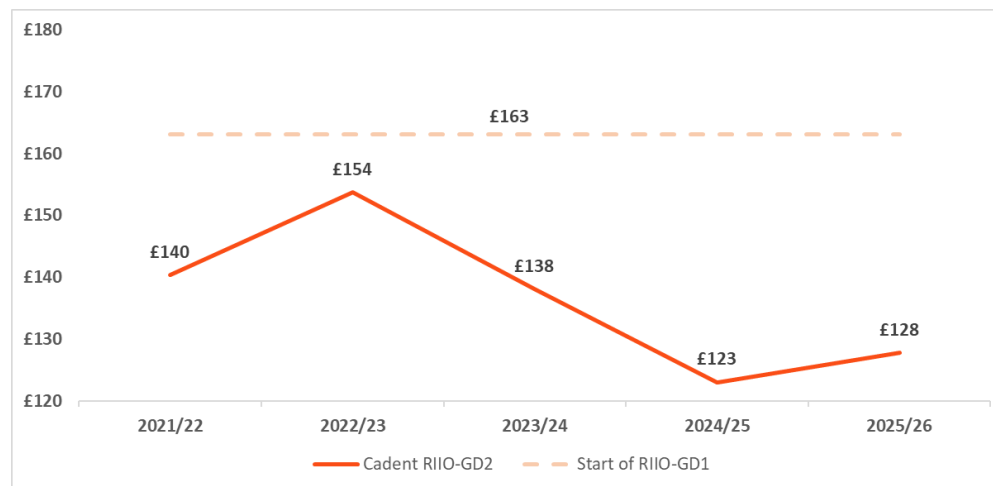


Figure 3.5: Average customer bill (22/23 price base)

Compared to the first year of RIIO-GD1 when charges in relation to LDZ services were £163 per customer on average, the average cost has reduced to £154 per domestic customer in FY22/23 and is forecast to reduce further to £128 (excluding the impact of inflation) by the end of RIIO-GD2.

We have excluded the exit capacity and supplier of last resort costs from the analysis as those costs are a pass through and not related to services provided.



4. Performance against our allowances

Totex performance

CADENT TOTEX (£m, 18/19 prices)	21/22	22/23	23/24	24/25	25/26	Total	Allowance	% Variance
Opex	383	413	406	398	397	1,998	1,945	-3%
Capex	158	190	194	168	134	843	832	-1%
Repex	440	466	444	442	425	2,217	2,190	-1%
Totex	981	1,069	1,043	1,008	956	5,058	4,967	-2%
Allowance	1,033	1,013	1,004	971	945	4,967		
Variance	51	(56)	(39)	(37)	(11)	(92)		
Variance	51	(5)	(44)	(81)	(92)	(92)		
Cumulative								
% Variance	5%	-6%	-4%	-4%	-1%	-2%		
Eastern	333	373	366	354	341	1,767	1,620	-9%
London	254	281	272	278	262	1,347	1,303	-3%
North West	235	245	231	213	198	1,121	1,151	3%
West Midlands	159	171	175	163	155	822	893	8%

Table 3.6: Totex performance vs. allowance

So far in RIIO-GD2 whilst delivering strong performance against our outputs we have overspent our Totex allowances by £5m (0.2%) cumulatively at a Cadent overall level. During 2022/23 we overspent our Totex allowances by £56m as our investment programme increased further in scale, whilst allowances reduced, and inflationary and market pressures impacted the cost base.

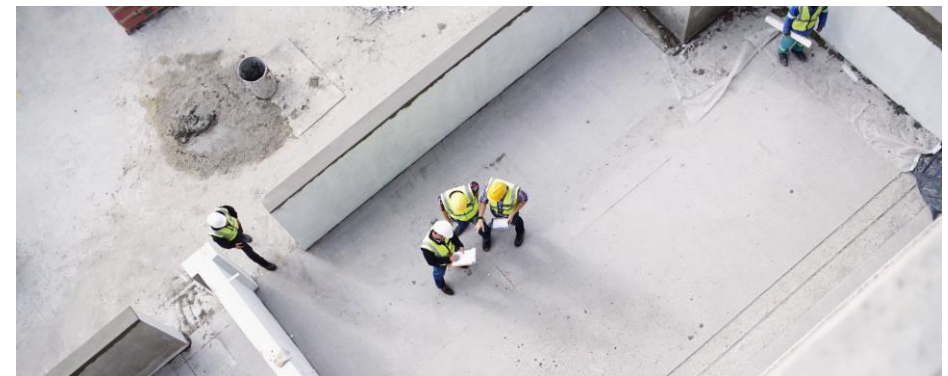
This year we delivered **Controllable Opex** within just 4% of the stretching allowance. This variance was predominantly due to inflationary and market pressures. Importantly, an increase in emergency and repair costs to respond to higher workload following a sudden spike in gas demand in December 2022 led to an exceptional level of customer calls, with an associated cost. In addition, building

resilience to deal with unexpected incidents outside of our control, including in Stannington Sheffield, added to resource costs.

We invested £11m more on **Capex** compared to allowances for the year. This was due to variance between the phasing of our delivery profile compared to the baseline included in our allowances, along with the above inflationary and market pressures seen across the cost base not covered through allowances. In addition, our capex programme included significant investment in a Governor Improvement Programme this year.

We invested 7% more on **Repex** this year than our allowances due to:

- Challenging Repex allowances driven by our already stretching business plan, the use of the 85th percentile in cost assessment and the inclusion of a very stretching efficiency assumption.
- Some key London regional factors not being recognised within our allowances, with average unit costs per meter running significantly above those allowed. As well as impacting our London network it also has a significant affect in our Eastern network which includes the Outer Met area of London.
- Significant inflationary and market pressures beyond those compensated for through our allowances, on materials and labour; and
- A significant increase in workload delivery this year, with a 6% increase in mains decommissioned from 2021/22; combined with differences in workload phasing between our delivery plans and those assumed in the final determination.



Opex performance

Controllable Opex

CADENT Controllable Opex (£m, 18/19 prices)	21/22	22/23	23/24	24/25	25/26	Total	Allowance	% Variance
Work Management	82	94	89	84	84	433		
Work Execution	187	205	189	185	184	950		
Emergency	50	53	49	47	47	246		
Repair	61	73	67	67	67	335		
Maintenance	58	56	52	50	50	266		
Other direct activities	19	22	21	20	20	102		
Business Support	100	101	113	115	116	545		
Training / Apprentices	13	14	14	14	14	69		
Total Opex Costs	383	413	406	398	397	1,998		
Allowance	414	396	388	371	375	1,945		
Variance	31	(17)	(18)	(27)	(22)	(53)		
Variance Cumulative	31	14	(4)	(31)	(53)	(53)		
Eastern	134	147	139	139	139	699	632	-11%
London	97	103	103	101	101	504	515	2%
North West	90	98	95	90	90	462	445	-4%
West Midlands	62	66	69	68	68	333	353	6%

Table 3.7: Controllable Opex

Our Controllable Opex (“Opex”) costs were £413m in 2022/23, £30m (8%) higher than the previous year. We expect operating costs to reduce in real terms in the final three years of RIIO-GD2 with ongoing efficiency and workload impacts from improving network performance reducing spend. The 2022/23 increases are predominantly driven by workload impacts including the unprecedented winter demand in December and Stannington incident. The ongoing variance to allowances are driven by factors including reductions in allowances and a pay award that impacts the forecast financials from 2023/24.

Work Management and Work Execution

While 2022 was the UK’s warmest year on record overall, it also saw a sudden spike in gas demand in December leading to an extraordinary increase in calls from customers which we were required to respond to along with the wider industry. These conditions led to a prolonged period of high work volumes, with December seeing seven of the ten highest ever daily recorded call volumes to the National Gas Emergency phone line. Volumes were higher than we experienced in December 2018 during the storm labelled the “Beast from the East”.

As a consequence, we spent £3m (6%) more on **Emergency** than in the previous year. All our networks saw significant increases in work volumes year on year, with the number of Public Reported Gas Escapes (“PRE”s) increasing by 10% from 2021/22 with London (15%) seeing the biggest increase. Over the last three years of RIIO-GD2, as a consequence of continued investment in the network, we forecast that emergency workload reduces slightly across all networks, delivering lower costs.

We are however continuing to closely monitor the impacts of the cost-of-living crisis on customers behaviours in maintaining their gas appliances which could result in additional call volumes.

During the busy December period, our team in the Eastern network also needed to respond to a major incident in the Stannington area of Sheffield. This incident saw unprecedented levels of water enter a four-mile area of the local gas network after a high-pressure water main burst, leaving more than 3,000 properties without gas during this cold period. Due to the seriousness and complexity of this incident we mobilised teams from across our business and supply chain and worked around the clock to restore customers’ gas supplies. Our response to this incident cost in the region of £7m which is reported within **Other Direct Activities**.

Our **Repair** workload increased by 4% in 2022/23 from the previous year, with London (19%) seeing the biggest impact. In addition to responding to challenging industry conditions noted above, we also saw an increase in repair volumes due to the record high temperatures experienced in the summer. Furthermore, this year we also had a strong focus on reducing the risk of programmed escapes and

increasing our winter resilience which also contributed to higher workload and operating costs relative to other years. This focus led to a reduction in the investment work ordinarily undertaken by these Repair teams, adding approximately £3m of labour costs and £2m of overheads within Opex.

We also used additional contractor resource to support our operations during the winter period and saw direct impacts on other direct costs, noticeably reinstatement, NRSWA (New Roads & Street Works Act) and mobile plant and traffic management costs. Overall, we saw an increase of £13m (21%) on **Repair** costs compared to the previous year. Repair costs are expected to reduce slightly over the remaining three years of RIIO-GD2 as work volumes fall.

Our emergency and repair processes have also been impacted by a new approach to managing fatigue as HSE expectations have changed in this area. This leads to more down time and increased resourcing costs for both direct costs (work execution) and in supervision (work management). We are working through this impact and will be submitting the evidence of this as part of the reopener in January 2024.

Operations Management includes the day-to-day planning and supervision of our direct and contract field-force resources and as such faced the same operational challenges as our Emergency and Repair teams. This impacted costs, with increases in overtime as well as travel and subsistence costs. This was the main contributory factor in an £11m (14%) increase in **Work Management** costs in 2022/23 from the previous year. We are planning to reduce our work management costs over the remainder of the period. However, responding to HSE fatigue requirements is expected to increase our resourcing levels beyond our plan to ensure we can cover shift patterns.

We spent £2m (3%) less on **Maintenance** this year, in line with our latest plan. This predominantly relates to reductions in costs associated with the phasing of our routine maintenance programme, particularly on Pressure Reduction Station activities ("PRS") and regulators. There has also been a reduction on Electrical and Instrumentation ("E&I") activities following the replacement of these assets as part of the Governor Improvement Programme. Maintenance costs are expected to

remain broadly flat over the remaining three years of the price control as we continue to ensure the resilience of our network assets.

Business Support costs remained broadly flat year on year.

We spent £4m (9%) less on **IT and Telecoms** in 2022/23 than in the previous year. Ongoing costs are consistent year on year, the reduction is the result of lower project spend in 2022/23. These costs are, however, expected to increase significantly over the last three years of the price control period. This relates to the timing of projects, particularly related to increasing our Data Best Practice maturity and Cyber resilience partially funded through Uncertainty Mechanism ("UM") allowances, as well as inflationary cost pressures affecting our license renewals.

Our **Property** costs increased by £4m (30%) year on year. This relates to the timing of the closure of our Ashbrook Court head office (November 2021) and Hinckley Operations Centre (October 2022) and commencement of occupation of our new offices at Ansty Park (May 2022). Our property strategy reduces costs in the long run following completion of the plan of reducing our office space requirement.

Property costs have also been impacted by inflationary pressures, through increased rents and utility bills. As such, we forecast an increase in costs 2023/24 before remaining flat in the last two years of the price control period.

We spent £3m (19%) more on **Audit, Finance and Regulation** this year. This relates to a ramp up in work on Sustainability, investment in our Net Zero ambition and the next price control review. We expect a continued growth in activities linked to the next price review, as well as the phasing of work on Net Zero and Personalised Welfare use it lose it allowances to drive additional costs in this area over the last three years of the price control. This is offset by a £4m (38%) reduction in **CEO and Group Management** costs, largely linked to corporate cost savings.

Insurance costs increased by £2m (29%), following the renewal of a number of competitively tendered contracts. This is an example of unfunded above inflationary market cost pressure. We expect these costs to now remain broadly flat over the remainder of the RIIO-GD2 period.

Costs associated with **Training and Apprentices** have slightly increased during the year as we continue to invest in our people with the average number of trainee's and apprentices during the year exceeding 200. Development of our people is a fundamental part of our strategy and we expect to maintain spend at this level over the remainder of the RIIO-GD2 period.



Non-Controllable Opex

Cadent Non-controllable Opex (£m, 18/19 prices)	21/22	22/23	23/24	24/25	25/26	Total
Shrinkage	54	53	28	27	26	188
Ofgem Licence	10	10	11	11	11	52
Network Rates	195	179	140	140	140	794
Pension Deficit	32	20	-	-	-	52
NTS Exit Costs	183	137	106	125	164	715
Xoserve	14	11	11	12	13	61
Other*	4	349	90	-	-	443
Total non-controllable costs	491	758	386	315	354	2,305
Eastern	164	276	139	113	128	820
London	100	160	84	70	77	491
North West	110	183	94	76	85	548
West Midlands	117	139	69	56	63	446

*Other = Miscellaneous pass-through inc. SOLR

Table 3.8: Non-Controllable Opex

Non-Controllable (or “pass through”) costs are largely outside of the control of network operators. Costs are charged to end customers as noted above and included in customer bills. The main variability recently has been in relation to:

- Shrinkage costs which are linked to global gas prices which we now forecast will remain below the historic high noted over the last two-year period; and
- Miscellaneous pass-through costs that largely relate to socialising the Supplier of Last Resort costs that are not expected to continue post 2023/24.

Capex performance

CADENT CAPEX (£m, 18/19 prices)	21/22	22/23	23/24	24/25	25/26	Total	Allowance	% Variance
LTS, Storage & Entry	27	31	33	38	45	174		
Connections	33	29	20	15	13	110		
Reinforcement (<7 barg)	15	12	26	24	22	99		
Governors	12	24	28	7	4	75		
Other Capex	71	94	86	85	50	386		
Total Capex costs	158	190	194	168	134	843		
Allowance	170	179	183	164	135	832		
Variance	12	(11)	(10)	(4)	2	(12)		
Variance Cumulative	12	1	(9)	(13)	(12)	(12)		
Eastern	70	72	83	80	66	370	323	-15%
London	27	37	36	36	30	166	161	-3%
North West	40	49	45	29	21	184	202	9%
West Midlands	21	32	30	23	17	122	145	16%

Table 3.9: Capex performance

Our Capex costs were £190m in 2022/23, £11m (6%) higher than our company allowances with a ramp up of £32m (20%) compared to the previous year. This year-on-year increase relates to our workload delivery plans which peak across 2022/23 and 2023/24 before reducing in the last two years of RIIO-GD2 in line with our allowances. We expect to spend broadly in line with our Capex allowances (1%) over RIIO-2.

Within our capital works we are seeing cost pressures on most lines driven by the price of materials, supply chain availability and the complexity of the work. This is offset in part by change in classification of IT spend (Software as a Service) that is now included within Controllable Opex.

Our **LTS, Storage and entry** costs were £4m higher than the previous year, the profile of OLI surveys led to a doubling in the volume undertaken in 2022/23 compared to the previous year. We forecast these costs to continue to increase over the five-year period mainly as a result of the workload profile.

Forecast increases are primarily in our Eastern network as a result of the phasing of capacity upgrade projects at Maltby, Eye Green, West Winch and Teversham covered by the Capital Projects PCD. Works in the first two years on these projects have largely focused on conceptual design and feasibility studies. We also expect our London network costs to rise in 2025/26 due to an increase in planned works relating to water bath heaters.

Across our networks we have seen higher customer driven chargeable diversion projects resulting in higher contributions netting off against underlying costs. This workload is expected to reduce over the remaining period of RIIO-GD2 period, with workload on non-chargeable diversions ramping up particularly in our Eastern and North West networks. We also expect costs to increase in the final two years of RIIO-GD2 relating to projects associated with encroachment on our network. As the nature and characteristics of this work is typically unique, the project forecasts are subject to change. We are working to identify whether we have the rights to charge back costs to the customer if structures cannot be removed, whether we can utilise the mains replacement programme or whether we claim incremental costs are funded through the Diversions and Loss of Development claims policy re-opener.

Connections expenditure fell by £4m (12%) to £29m across all Networks. The national cost of living crisis has impacted Customer demand for new connections, as well as the number of new homes being built by developers. This all caused a decrease in connections volumes across our Networks.

Design and Quotation volumes are down by 21% from last year across all Cadent networks combined, North West (28%) being the network most impacted. The reduction has been most noticeable for Fuel Poor Connections (81% reduction year on year) following changes in industry policy and the reduced availability of funding for in-home first-time heating. These allowances have now been repurposed to add to our continued work on Vulnerability and Carbon Monoxide,

Except for new housing services in London, there has been a substantial decrease in all connection types in each network compared to last year. North West again are the most impacted with a reduction of 43%.

Any change in connections workload resulted in adjustment to allowances and revenues via a volume driver mechanism.

Mains reinforcement costs reduced this year by £3m. This is needs driven and we look to reinforce where it is economical to do so as it allows a better whole life cost of project delivery and ensures we maintain resilience on the network. We will assess year on year as we develop our mains replacement delivery programme on where this is most economical to deploy to keep costs down for customers.

Cadent is committed to delivering a three-year **Governor Improvement Programme** (commencing in January 2021) to our (9,305) governor sites, ensuring the entire asset population is compliant with DSEAR legislation, as well as addressing other identified issues including vegetation management, civils, corrosion, security and HASAWA signage requirements.

At the last HSE update on 6 July 2023, it was reported that 7,600 governors had been completed and signed off, and that a robust plan is in place to deliver the balance by the end of December 2023, which is reflected in the profile, with expenditure forecast to reduce significantly in the last two years of the price control.

This has resulted in both an increase in reported Governor investment and **Other Network Capex**, included within **Other Capex**, which has increased by £23m (33%) in the year, largely driven by investment in electrical and instrumentation assets.

Investment in **IT and Telecoms** (Other Capex) increased to £9.2m due to the ramp up in project delivery and replacement of field and office devices in 2022/23 but continues to be significantly lower than plan to due to the Software as a Service (SAAS) change in accounting treatment which results in large elements of planned project spend being classified as Controllable Opex.

The Fleet Transformation Programme is now well underway, targeting our vehicles and contributing towards our net zero commitments resulting in an increase in expenditure on **Vehicles** (Other Capex) in 2022/23.

We continue to invest in our **Property** (Other Capex) portfolio with expenditure of £20m during the year, a £3m increase compared to 2021/22. The Ansty head office and Hinckley Operating centre relocation project was completed during the year. The new Wolverhampton office at Planetary Road was also opened enabling the closure of both Stafford Road and our Windsor Street site in Birmingham.



Repex performance

Repex Costs

Our investment in Repex totalled £466m in 2022/23, £28m (6%) higher than our company allowances and £26m (6%) higher than the previous year having delivered 6% higher workload. We expect costs to reduce over the remaining three years of RIIO-GD2 due to differences in workload phasing. Overall, we are forecasting to spend slightly more, £28m (1%), than the five-year allowance, with variability across the networks as our Eastern and London networks invest more than allowed. This performance is reflective of:

- The challenging RIIO-GD2 settlement driven by our already stretching business plan, the use of the 85th percentile in cost assessment and the inclusion of a very stretching efficiency assumption.
- Inflationary pressures beyond those compensated for through allowances, including on competitive market for resources driving up labour rates, particularly impacting our London and Eastern networks which show expenditure being greater than allowances and higher costs of raw materials.
- Regional factors in our London network from working in this unique operating environment. The dense nature of population and the resulting congested utility ecosystem limits the use of least cost techniques (with insertions of Polyethylene pipe often not possible) and has increased delivery times as we need to navigate complex underground networks. The type of housing stock, particularly the presence of converted flats and listed and/or protected buildings means greater levels of enabling and delivery work are needed relative to when replacing similar lengths in the presence of other building types. Alongside these factors, intensive urban road and foot traffic drive additional costs due to the need to break up harder wearing road and pathway materials and comply with streetworks restrictions. Whilst some of these factors were reflected in the allowances for London, we note as part of the RIIO-ED2 final determinations, further regional factors were awarded to network operators and in our view, this illustrates that the full scale of factors that impact our efficiency in London is not currently being accounted for.

CADENT REPEX (£m, 18/19 prices)	21/22	22/23	23/24	24/25	25/26	Total	Allowance	Variance
Tier 1 Mains	257	269	248	244	243	1,261		
Tier 1 Services	81	83	68	64	62	359		
Tier 2A Mains & Services	1	0	4	4	3	13		
Tier 2B Mains & Services	4	6	9	7	7	33		
Tier 3 Mains & Services	8	11	13	14	9	55		
<2" Steel Mains & Services	9	10	7	6	6	38		
>2" Steel Mains & Services	6	6	6	5	5	29		
>30m Mains	5	1	-	-	-	6		
Other Mains & Services	4	0	6	5	5	20		
Diversions Mains & Services	5	4	6	19	12	46		
Other Services	42	51	52	51	51	246		
Tier 1 Stubs	3	1	5	4	4	16		
Risers	13	19	17	17	16	83		
Robotic Intervention	1	4	4	1	1	12		
Total Repex Cost	440	466	444	442	425	2,217		
Allowance	448	438	433	437	434	2,190		
Variance	9	(28)	(11)	(6)	9	(28)		
Variance Cumulative	9	(20)	(31)	(37)	(28)	(28)		
Eastern	129	154	144	136	136	698	665	(33)
London	130	141	133	141	132	677	626	(51)
North West	105	98	91	94	87	475	504	28
West Midlands	76	74	76	72	70	367	395	28

Table 3.10: Repex costs

Repex workload

Repex spend is directly correlated to the amount of length we have or are forecast to decommission. In 2022/23 we have decommissioned a total of 1,781km of metallic mains across all tiers and materials, a 6% increase on the previous year.

Cadent (km)	21/22	22/23	23/24	24/25	25/26	Total
Tier 1*	1,537	1,597	1,527	1,517	1,517	7,694
Tier 2A	1	2	7	7	7	24
Tier 2B	11	19	21	21	21	92
Tier 3	6	4	5	5	4	24
Iron Mains	1,555	1,622	1,560	1,549	1,549	7,835
Steel	54	62	43	43	45	246
Other	37	61	24	19	19	161
Diversions	36	38	31	31	31	167
Total	1,682	1,784	1,657	1,642	1,644	8,409
Eastern	563	638	590	590	590	2,970
London	329	351	350	350	350	1,729
North West	471	458	395	395	395	2,114
West Midlands	318	337	323	308	310	1,595

Table 3.11: Repex workload²

The largest portion of our Repex spend relates to decommissioning and replacing **Tier 1 iron mains** and undertaking interventions on the associated services. This accounted for 76% of the total Repex spend in 2022/23 and 73% of our actual and forecast spend over the price control period, with Tier 1 services volumes expected to fall. During RIIO-GD2 this work is captured within a Price Control Deliverable (“PCD”) and the base workload within our **Tier 1 Mains PCD** is just over 7,692km across RIIO-GD2, or 1,538km per annum. We delivered 1,596km in 2022/23, bringing our total to date for RIIO-GD2 to 3,131km which is 2% more length than

the baseline assumes. This positive delivery against the baseline is reflective of the hard work in implementing our new Repex delivery model. In terms of work mix, our delivery plans will see us being within -2% to +3% against the PCD target in all networks. The Tier 1 PCDs “true-up” allowances at the end of the period so that they reflect the actual work delivered.

Tier 2A Mains can be difficult to predict and as such is subject to a volume driver revenue adjustment mechanism. Our delivery in the first two years of RIIO-GD2 has been lower than originally forecast, however we expect workload to increase during 2023/24 and to be broadly in line with our period forecast of 24km.

On our **London Medium Pressure** programme, we have already replaced 7.8km of mains (around 80% of the period target) of the planned mains for the RIIO-GD2 period as well as two of the four planned Governor interventions. We remain on track to deliver against our PCD output over the five-year period.

Diversions spend is expected to ramp up in year four, mainly in our Eastern and North West networks where we are expecting to complete a number of non-chargeable diversion projects. We also expect an increase in workload over the final three years of the plan across our networks on built over structures as noted earlier within Capex.

We expect to deliver significantly more **Steel Mains** during the five-year period than included in the final determination. This increase relates to obligations we have to replace associated steel mains that are directly connected to our Iron Mains. In the first two years we have seen higher volumes of steel per km of iron than historically, and we expect this to continue over the remainder of the period. Steel mains form part of the Network Asset Risk Metric (NARM) mechanism where we are funded to remove risk across a number of asset categories. As such, this additional steel mains delivery will contribute towards any reactive workload forecast within the NARM baseline that does not materialise, trading across asset types / categories and/or over-delivering against our monetised risk targets.

² Tier 1 workload in table includes Tier 1 Mains decommissioned PCD plus Tier 1 Stubs

5. Output performance

Performance highlights

We set out in our RIIO-GD2 business plan the outcomes our customers and stakeholders want us to deliver. In the section below, we provide the key performance highlights against each of these outcomes and explain how we have performed against the relevant regulatory outputs or commitments that sit under these.

Delivering a resilient network to keep the energy flowing safely and reliably



1.6m
calls to the
National
Gas
Emergency
number

90%
of your calls
answered in
30 seconds

99.9%
Network
reliability

Tackling climate change and improving the environment



4%
Reduction
in
shrinkage
emissions

411
Zero-carbon
commercial
vehicles
purchased

2%
reduction in
our
Business
Carbon
Footprint

Providing a quality experience to all of our customers, stakeholders & communities



9.2
Average
Customer
Satisfaction
score

£193m
in social
benefits
through
VCMA
projects

89%
Complaints
resolved
within one
working day

Trusted to act for our communities



2.9m
Invested in
the Cadent
Foundation

640
days in
employee
volunteering

£0.2m
Raised
through
Employee
Volunteering

Delivering a resilient network to keep the energy flowing safely and reliably

Responding to gas emergencies

Answering emergency calls

We operate the National Gas Emergency Service contact centre, providing a 24/7 emergency call handling service, taking calls and providing safety advice on behalf of all gas networks across the UK.

In 2022/23 we received c.1.6m telephone calls and answered 90% (89.82%) within 30 seconds. The performance is lower than last year predominantly due to a period in December 2022 in which we received an unprecedented volume of calls to the National Gas Emergency Line.

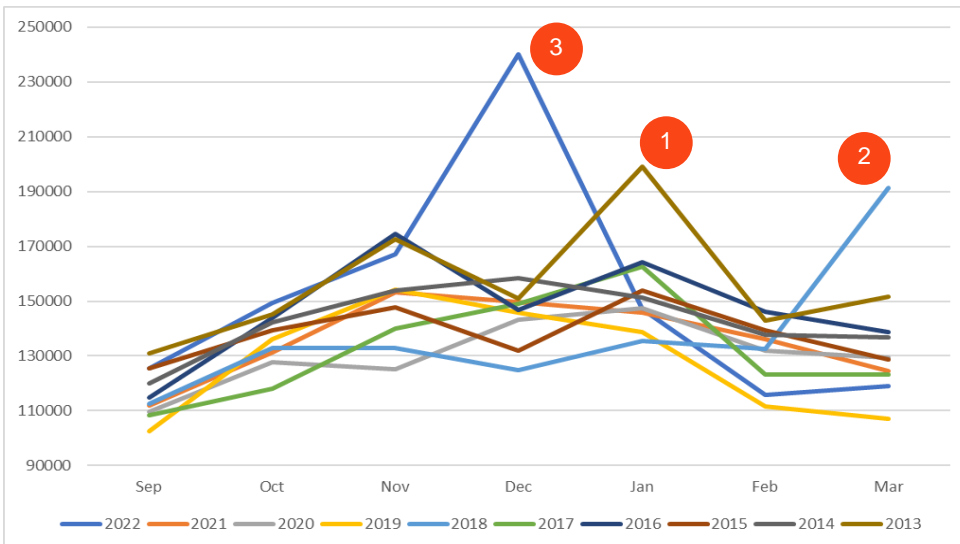


Figure 5.1: Monthly Gas Emergency Call Volumes over last 10 years in winter periods

Point on graph	Month	Volume of calls in month	Additional Information	Duration
1	Jan 2018	198,969	Odorant release from France	1 day
2	March 2018	191,383	'Beast from the East'	3 days
3	Dec 2022	239,962	December 2022 Incident Period	12 days

Table 5.2: Highest three discrete months of Emergency Call Volumes over last 10 years

The high level of calls was caused by a combination of the cost of living crisis and a significant cold snap. This had a substantial impact on call volumes to Energy Suppliers and Homecare providers which their call centre services were unable to manage as well as them not being able to service in home appliances in a timely manner. In addition, there was a surge of pre-payment meter customers who had insufficient credit.

Customers were largely unable to contact their suppliers during this period due to a combination of the volume of traffic into the suppliers and availability of their channels. In the absence of an alternative contact number, customers called the National Gas Emergency number, leading to a significant deterioration in our call handling service. This had a substantial impact on the number of emergency jobs created which also impacted the emergency response service (*see attending emergency gas escapes section on page 12*).

We declared a major incident and implemented our incident command structures on 10th December. The incident period started on 9th December and lasted until 20th December.

During the incident period we responded to minimise the impact through a number of activities, including:

- Triggering all our contingencies to respond to calls as best as possible.
- Writing out to and engaging with suppliers to help us minimise misdirected calls.

- Amending our call scripts and triaged where possible to ensure we prioritised genuine gas emergencies, including invoking a recorded message advising customers to please disconnect if not contacting for a gas emergency.
- Implementing a communication campaign across our social media channels throughout the incident, advising customers of the appropriate use of the Gas Emergency service. This included both promotion across Cadent digital channels, as well as targeted advertisements within geographic hotspots.

The incident revealed a number of industry-wide issues that need to be explored to help mitigate similar incidents taking place in future. We have been working with the other Gas Networks and Gas Suppliers, via Energy UK, to look at ways in which we could collectively signpost customers to the right call centres and communication channels, to better coordinate the resilience of the services across the industry in peak times. This work has been supported by both the HSE and Ofgem and dovetails with an Ofgem consultation on consumer protection standards which amongst other things is looking at the availability of supplier call centres.

Attending emergency gas escapes

We provide a gas emergency service free at the point of use which keeps people safe and warm in their homes and businesses. We respond to internal and external gas escapes and to potential cases of carbon monoxide poisoning from appliances.

While 2022 was the UK's warmest year on record overall, it also included a prolonged spell of cold and snowy weather during the winter period. The met office advised that 2022 was one of the most significant cold snaps since December 2010. This led to a significant and prolonged spike in work volumes resulting in invoking maximum staffing levels under the winter plan due to elevated and sustained emergency call volumes.

In 2022/23 we attended over 316,000 gas escapes, an increase of 10% compared to last year. As explained, we received an unprecedented number of calls to our emergency line in December 2022, which led to a significantly higher number of emergency jobs being created, severely impacting our ability to respond. In addition, we also experienced an unusually busy summer period for emergency, particularly in our London network, where the publicity related to the tragedy in Croydon understandably drove a wider public need around gas safety checks. The impact of this and the increased call volumes during the December cold snap meant that we were slightly below the annual standard of service in our London and NW networks for controlled and uncontrolled emergencies as shown in the table below.

%	One hour response to uncontrolled emergencies	Two hour response to controlled emergencies
EN	97.1%	97.7%
LN	95.2%	94.9%
NW	96.0%	96.5%
WM	97.6%	97.8%

Table 5.3: 22/23 Emergency Standards of Service performance

Due to the volume of calls we received over this relevant period; we asked customers additional questions in order to determine whether they were gas emergencies we could assist with, or issues that needed to be re-directed to suppliers or gas safe registered engineers. However, if there was ever any doubt, we used a safety-first approach and despatched an engineer to attend.

Prior to the incident period, our performance in meeting ESOS was above the 97% standard in all our networks and we were also over 97% for the period after the incident period. However, the incident period massively impacted our performance due to the volume of jobs created, including non-gas emergencies. As explained, we are leading industry work to mitigate the chances of this occurring in future.

Mains replacement

Tier 1 Mains PCD

The Tier 1 mains PCD includes a baseline target for us to decommission 7,693km of Tier 1 iron mains by the end of RIIO-GD2 across all our networks. We have replaced 3,131km of Tier 1 Mains over the first two years of RIIO-GD2, increasing in both length of mains replaced, and complexity of works compared to last year.

At a cumulative level we have delivered beyond the total length against a straight profile in all networks, except LN. When adjusted for the diameter mix, we are slightly behind the baseline in EN, LN and WM, and ahead in NW. However, we have plans for our workload to increase again next year and are confident that all networks will have achieved the period targets by the end of RIIO-GD2.

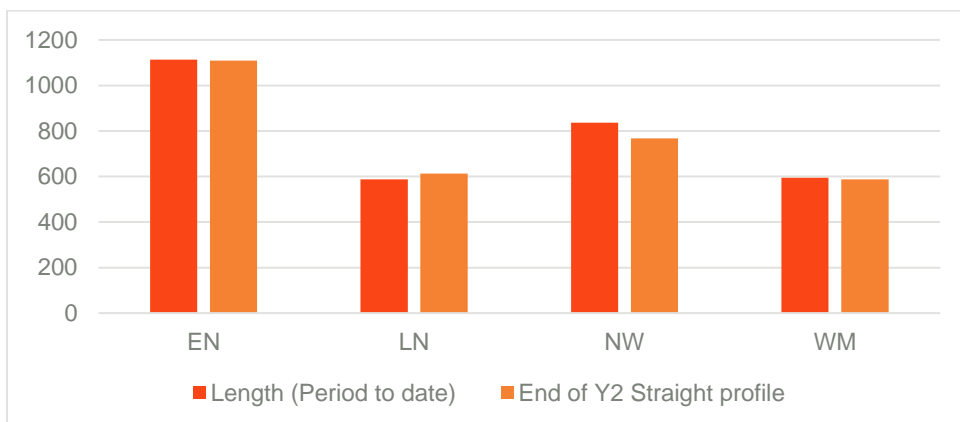


Figure 5.4: Tier 1 Mains PCD – Cumulative length decommissioned vs. straight profile

Tier 1 Services PCD

The Tier 1 services PCD includes a baseline target for us to undertake 779,882 interventions (i.e. relay or test & transfer) to services associated with Tier 1 mains by the end of RIIO-GD2 across all networks. We have undertaken more than 287,000 service interventions over the first two years of RIIO-GD2 and this year our interventions increased by 11% compared to last year.

Whilst there is a link between the length of mains decommissioned and the number of services delivered, it is not always linear as the density of services to mains will differ depending on the nature of the geographies we are working in.

NW has delivered 1% more services than the straight profile. However, EN, LN and WM have delivered less services compared to the straight profile, as we experienced a lower service density per kilometre of Tier 1 main decommissioned than assumed within our baseline target.

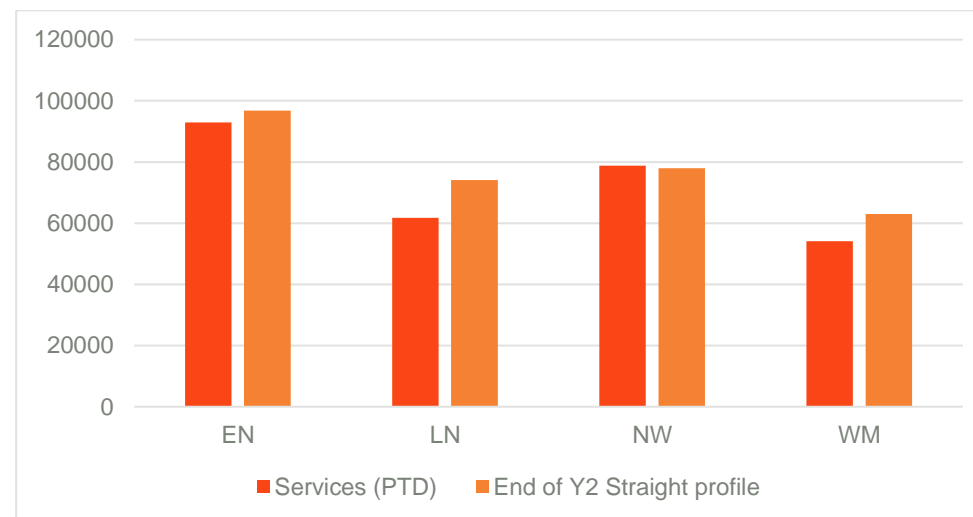


Figure 5.5: Tier 1 Services PCD – Cumulative interventions vs. straight profile

As our Tier 1 mains workload delivery increases in 2023/24, we expect the Tier 1 services delivery to also increase and expect to be within the 10% PCD deadband across all our networks by the end of RIIO-GD2.

At the end of the price control our allowances under both the Tier 1 mains and services PCDs will be adjusted for any variance realised between our baseline targets and the actual work we deliver. This dynamic mechanism provides flexibility for GDNs to optimise delivery whilst ensuring that customers only pay for the work delivered.

As part of our tier 1 programme, we also have obligations to replace associated steel mains that are directly connected to our Iron. These include for example steel

back rails (2" steel that runs along the back of a set of properties to bring gas to the rear of the property). We are seeing increased volumes of this work over the first 2 years of RIIO-GD2 and expect it to continue into years 3-5. This is again connected to the nature of the geographies we are working in.

London Medium Pressure (LMP)

The LMP programme of work, which started in RIIO-GD1, is part of a long-term programme to upgrade and replace strategic sections of the Central London Medium Pressure network. This work needs to be undertaken primarily due to Asset Health and the resultant risk the associated mains pose to nearby buildings and in particular their populations.

The work will take place in some of the most sensitive locations within central London and therefore it is important that we deliver the work in close consultation with stakeholders and with the least disruption to residents, workers, businesses and tourists.

For RIIO-GD2 we proposed to replace 9.9km and four specific governors across the route. Our over-arching objective for RIIO-GD2 is to deliver the renewal of the assets in the next phase of the LMP programme to meet our customer and stakeholder expectations with regards to work execution, safety, resilience and value for money.

In 2022/23, we decommissioned a further 2.5km and commissioned 2.7km of LMP main and replaced an additional Governor. Overall, we have replaced 7.8km of LMP mains over the first two years of RIIO-GD2, representing 79% of the PCD target, and completed two of the four planned Governor interventions. We are confident we will meet the end of period target.

Asset health investment

Capital Projects PCD

For RIIO-GD2 Ofgem introduced the Capital Projects Price Control Deliverable (PCD), an output which holds networks to account for the delivery of specific capital investments. The PCD mechanism allows for funding to be returned to customers if the output is not fully delivered by the end of the period.

We have three categories of work that we agreed to deliver against this PCD; Capacity upgrades (>7 bar) at 13 sites, Metering systems replaced at 18 Offtake sites, and the replacement of interim PE pipes within the service tunnel at Lowestoft Harbour. Last year we completed the Lowestoft Harbour project replacing the interim PE pipe with a permanent 8" steel pipe.

Of the 13 Capacity Upgrade projects:

- One project (Hambleton PRI) is no longer required due to a cancellation of a customer request and therefore no further need to reinforce the site;
- 6 projects have had conceptual designs completed ready for detailed design;
- 4 projects are at the stage of detailed design and are expected to be completed in 2023/24; and
- Two projects have had detailed design completed and are progressing through to procurement of materials and construction.

Of the 18 Offtake sites requiring metering systems to be replaced:

- 15 projects are at the stage of detailed design;
- One project has had detailed design completed and is progressing through to procurement of materials; and
- Two projects have had materials procured and are planned to be constructed in 2023/24.

With the exception of Hambleton PRI Capacity upgrade (which is no longer required), we expect to complete all Capital projects by the end of RIIO-GD2.

High Rise Building Plans

We have developed 1,103 High Rise Building (HRB) plans over the first two years of RIIO-GD2 which goes beyond our end of 22/23 targets. We have achieved this through building on the work done last year to refine the processes, systems, and resources to help automate key elements of the plans along with active engagement with building owners and other key stakeholders to build on the information contained within the plans.

This is a significant improvement in performance and demonstrates a recovery of our 21/22 shortfall and achievement of our 22/23 targets across all our networks. The development of these plans will support with planning and engagement activities during works on these complex buildings and we are confident that our period targets will be achieved by the end of RIIO-GD2. We are aware that other networks are now looking at improving their MOB's data and records, and our leading approach here could provide a platform for the other networks to follow.

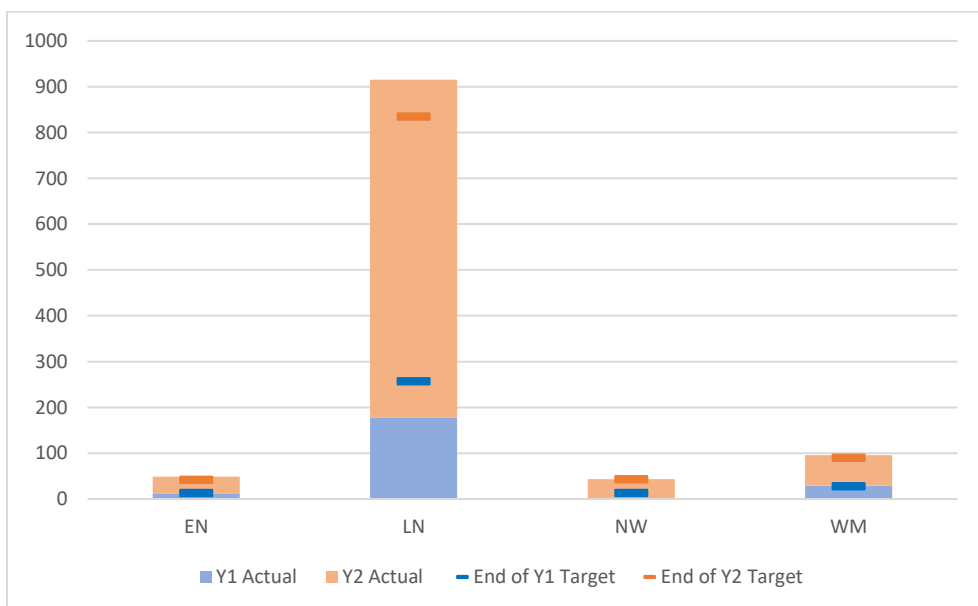


Figure 5.6: High Rise Building Plans – 21/22 and 22/23 performance

Cyber and IT

Cyber Resilience OT and IT

Cyber Security continues to be a priority with regular engagement with all stakeholders including our Board, Ofgem and the National Cyber Security Centre (NCSC). We continue to improve our Cyber Security strategy, adding a number of controls across Access Management, Incident Management and Business Continuity.

Through the RIIO-GD2 framework we currently have a number of Price Control Deliverables (PCD) aimed at enhancing our overall cyber resilience strategy, and that complements our requirements under the Network and Information Systems (NIS) Regulations for both Information Technology (IT) and Operational Technology (OT) respectively, with allowances granted to us for investing in the latter over the first three years of RIIO-2.

The purpose of these deliverables is to:

- Demonstrate activities implemented that contributes to increased cyber resilience,
- Invest in technology to improve our cyber resilience (especially in relation to OT)
- Mitigate associated risks, including changes to level of risk and the cyber threat landscape,
- Improve our status with respect to Cyber Assessment Framework (CAF) outcomes on our network and information systems.

As cyber threats have significantly increased on a global scale over the last few years, we continue to closely monitor threats, assessing risks, and adapting our resilience plans in this area to ensure customer data and our critical systems remain safe and secure. Being part of the Critical National Infrastructure (CNI) means that technology is core to our operations, and we understand the impact system failures can have on customers and businesses. That's why we're committed to delivering a safe, secure, and reliable network for our customers and the communities we operate in, both now and for the future; and is why we utilised the re-opener window in January 2023 to apply for additional funding to help us

achieve this. Due to this work being critical and therefore sensitive in nature, we will continue to provide detailed progress reports to Ofgem in line with the reporting requirements set out in our licence.

Data and Digitalisation

Our [Digitalisation Strategy and Action Plan](#) provides visibility to our stakeholders on the progress we are making in designing and building digital products and solutions.

Building on our Brilliant Basics strategy that is designed to simplify everything, we have delivered changes to provide:

- Enriched processes that allow stakeholders to request and receive Cadent data that are of public interest and support our net zero ambition with improved data triage process, release of data dictionaries and metadata expressed in Dublin Core standard.
- We have laid the foundations for Open Data Portal (conceptual architecture design and functional and non-functional requirements for the solution).
- A new network visualisation tool that supports the journey to net zero and a geographical model that is being shared with Local Authorities to inform their future energy network planning.
- New modernised Field Services Management system for our Field force that standardise the data captured in the field and automates the integration with our core systems.

Within our IT department, we have progressed our Agile Transformation, focusing on transparency of change and iterative ways of delivering products and services. We have introduced a product centric model and constructed Data ART (Agile Release Train) that takes the responsibility for Data Products and Data Platforms to allow us to deliver our Target Data Architecture and ensures we are moving towards common data models and standardised ways of describing our data with appropriate attention given to our metadata and data quality.

Through the year, we continued chairing a Digitalisation Working Group and our Data Governance Group to ensure there was senior oversight of new initiatives and appropriate coordination for the delivery of change.

Providing a quality experience for all our customers, stakeholders & communities

Customer service

Customer Satisfaction

We have continued to make significant CSAT improvements in 2022/23 with all our networks improving at an aggregate level and on average achieving a score of 9.20 out of 10 (0.15 increase in score vs. last year), representing our highest ever score since the introduction of the incentive at the start of RIIO-GD1. We are particularly proud of our performance in our Connections service where we expect our networks to be positioned as the leading performers in the sector.

Network	21/22	22/23	Movement from last year
EN	8.97	9.21	+0.24
LN	8.88	9.05	+0.17
NW	9.24	9.27	+0.03
WM	9.08	9.20	+0.12

Table 5.7: Average CSAT scores by network across all surveys

Emergency response and repair

Network	21/22	22/23	Movement from last year
EN	9.50	9.57	+0.07
LN	9.29	9.39	+0.10
NW	9.55	9.58	+0.03
WM	9.46	9.56	+0.10

Table 5.8: ER&R CSAT scores by network

Customers value a rapid response to gas emergencies and quick repairs, and we have delivered improved satisfaction scores in this area for several years. Our 2022/23 plans remained centred on learning from key customer insights with a

specific focus on reducing disruption from our works. This includes reducing the frequency and length of gas supply interruptions, and ensuring we complete reinstatement works efficiently and to a high standard. Working with our new contract partners and enhancing our ways of working for reinstatement works has delivered significant improvements in our next day (D+1) response for customers.

As a result, CSAT scores have improved in all four networks by an average of +0.08 compared to last year. We achieved an average of 9.54 out of 10, exceeded our regulatory target of 9.37 in all four networks.

Connections

Network	21/22	22/23	Movement from last year
EN	8.76	9.18	+0.42
LN	8.73	9.15	+0.42
NW	9.05	9.19	+0.14
WM	8.82	9.27	+0.45

Table 5.9: Connections CSAT scores by network

We have continued to see significant benefits from the transfer of our connections services into a direct workforce operation, aligning delivery and customer experience outcomes to our local area model which encompasses 28 local areas across our networks. By maintaining our focus on all the key customer touchpoints, reducing lead times for works and continued investment in simplifying our application processes, we have driven customer satisfaction to record levels.

Satisfaction with our connections service increased significantly in all four of our networks by an average of +0.36 compared to the previous year. We achieved an average of 9.19 out of 10, significantly exceeding our regulatory target of 8.38 in all four networks. Our four regulatory networks are now at the forefront of customer experience for connections, with more improvements in the pipeline for next year.

Planned work

Network	21/22	22/23	Movement from last year
EN	8.65	8.88	+0.23
LN	8.61	8.60	-0.01
NW	9.11	9.04	-0.07
WM	8.96	8.76	-0.20

Table 5.10: Planned work CSAT scores by network

In 2022/23, we entered a second year with new contractual and operating arrangements for our planned work activity. Our wider customer strategy and delivery model places greater emphasis on network and local level accountability, which means tailoring experiences to our local communities. Our Network Directors are responsible for driving new ways of working to improve customer and colleague satisfaction, while our teams and partners share our purpose and values to deliver first time, every time, and promote a collaborative and collective culture of responsibility. This helps us share best practices across our networks and promote innovative ideas.

We have continued to deliver an excellent service to customers, achieving an average score of 8.86, exceeding the regulatory target of 8.51 in all four networks. Whilst this is a positive achievement, we acknowledge that the scores have plateaued at the level we delivered last year (-0.01) and we are clear on the need for ongoing focus to ensure continuous improvement. Demonstrating our commitment to improving, in the Eastern network, there has been a significant increase in customer satisfaction compared to last year (+0.23).

Complaints handling

When things do go wrong, we know customers want issues resolving quickly and without any hassle. We are pleased that we improved an already industry-leading level of performance in our responsiveness, with all our networks improving on performance against the Complaints Metric and D+1 resolution compared to last year.

Network	21/22	22/23	Movement from last year
EN	2.10	1.50	-0.60
LN	1.67	1.20	-0.47
NW	1.41	1.36	-0.05
WM	1.65	1.09	-0.56

Table 5.11: Complaints Metric scores by network

Network	21/22	22/23	Movement from last year
EN	79.0%	87.8%	+8.8%
LN	85.7%	89.4%	+3.7%
NW	89.1%	89.3%	+0.2%
WM	85.6%	89.5%	+3.9%

Table 5.12: D+1 Resolution by network

Our strong performance was driven by continued focus on empowering local teams to resolve complaints directly by using their knowledge and taking ownership to swiftly resolve complaints to the satisfaction of the customer. We continue to use learning from the processes put in place in the previous year for lessons learnt from complaints and sentiment analysis to make targeted improvements.

Connections Guaranteed Standards of Performance (GSOP)

Minimum standards for our connections delivery service are measured via Guaranteed Standards of Performance (GSOP). Customers are entitled to a compensation payment if we fail to deliver against them and we are obliged to meet them at least 90% of the time (as per Standard Special Condition D10: Quality of service standards). In 2022/23 we exceeded the 90% standard for all GSOP across all our networks. The GSOP minimum standards were introduced almost 20 years ago to drive improvements in service, however, given the excellent customer satisfaction scores we are delivering on connections, we are unclear on the merits of the Connections GSOP standards and whether they reflect what customers value most.

GSOP	EN	LN	NW	WM
GSOP 4: Provision of standard quotation	99.8%	99.2%	99.6%	99.2%
GSOP 5: Provision of non-standard quotation (≤ 275 kWh per hour)	99.9%	99.4%	99.1%	99.0%
GSOP 6: Provision of non-standard quotation (> 275 kWh per hour)	96.0%	98.1%	90.3%	95.1%
GSOP 8: Response to land enquiries	99.4%	99.7%	99.1%	99.6%
GSOP 9/10: Provision of a date for starting and finishing work	99.3%	96.8%	96.9%	99.1%
GSOP 11: Completing work in the agreed timescales	96.3%	96.5%	93.4%	95.8%

Table 5.13: Connections GSOP performance against 90% standard by network

Keeping the energy flowing

Unplanned interruptions

For RIIO-GD2, Ofgem introduced a financial output delivery incentive to ensure that GDNs manage any unplanned interruptions to customers' gas supplies in a timely manner and that customers are protected from any deterioration in performance. Cadent has two Unplanned Interruption measures, one measuring the average duration of unplanned interruptions in MOB's and another measuring the same for all other buildings (i.e. non-MOB's). For each measure Ofgem set a Minimum Performance Level as well as an Excessive Deterioration Level for each network, with a financial penalty increasing between these levels.

Unplanned interruptions in non-MOBs performance

In 2022/23, all our networks performed better than the Minimum Performance Level, however there was a slight increase in the average duration in two of our networks. The duration of interruptions is dependent upon a number of factors including weather conditions and this year's performance was impacted by the high call volumes associated with a prolonged period of cold weather in December.

Network	Minimum performance level	Excessive deterioration level	2021/22 performance	2022/23 performance
EN	12	17	5	7
LN	14	19	12	12
NW	14	19	8	9
WM	13	18	8	8

Table 5.14: Non-MOBs Unplanned Interruptions Average Duration (Hours)

Unplanned interruptions in MOBs

In 2022/23, all our networks performed better than the Minimum Performance Level. The average duration for a MOB's Unplanned Interruption reduced in EN, LN and WM compared to last year, and whilst the average duration increased in NW, it's performance remains significantly lower than the Minimum Performance Level.

Network	Minimum performance level	Excessive deterioration level	2021/22 performance	2022/23 performance
EN	518	718	389	106
LN	601	801	583	521
NW	601	801	55	81
WM	601	801	331	94

Table 5.15: MOB's Unplanned Interruptions Average Duration (Hours)

Case study: 'Monumental effort' in Stannington

Late on Friday 2 December 2022, a water main burst and flooded the gas network in the Stannington area of Sheffield. Once the extent of the incident had been identified, a huge team mobilised from across the country assembled to tackle the problem, working day and night for two weeks in freezing temperatures to restore gas to homes and local businesses.

The furthest points affected were four miles distance from each other, and more than 3,000 properties were affected, whether by loss of gas completely, poor pressures or damage caused to boilers and appliances. At the peak of activity, more than 250 engineers and support staff were on site from all our networks and supply chain, plus 50 staff from Sheffield City Council, the British Red Cross, Northern Powergrid and Yorkshire Water, as well as mutual aid from Northern Gas Networks and SGN.

After a monumental effort, gas was restored to every property by the 16 December, leaving a lot of tidying up to do in the local area. We set up a dedicated phone line to enable direct compensation payment to customers, rather than via their supplier. These direct payments were paid for seven days as a minimum, with each day's payment double the statutory amount.

Collaborative streetworks

The Collaborative Streetworks financial incentive was introduced in RIIO-GD2 for London-based networks. We have delivered 6 projects in our London network reducing disruption by 291 days. Across all of our collaboration projects delivered, including those that did not qualify for the incentive, we have achieved 1018 days of avoided disruption. Whilst there is a fixed incentive reward for each project delivered, the real value each project is delivering to customers and the wider community is much greater and this needs to be reflected when the incentive is updated or re-calibrated.

Project name	Collaborative partners	Estimated number of days saved
Lansdowne Grove	Thames Water	36
Cabul Road	Thames Water	49
Green Lane	London Borough of Hounslow	31
Hendon Wood Lane	Affinity Water	69
Renwick Road	London Borough of Barking and Dagenham	49
Long Acre	Westminster City Council, Thames Water, UKPN, and Virgin Media	57
		291

Table 5.16: 2022/23 Collaborative streetworks projects delivered

We have utilised the monitoring and evaluation (M&E) tool for all the incentive applicable projects and have also used this to show the benefits to local authorities prior to starting works to help drive collaboration. Our 'collaborate on everything' model we started last year continues to be successful and we have managed to involve lots of different organisations and workstreams. This year our work at Hendon Wood Lane with Affinity water was recognised with an award at Streetworks UK for Best Collaborative Works in 2022.

All our incentive-applicable projects were presented to the GLA (Greater London Authority) for independent approval – this was detailed in our new process flow report which we completed throughout the year and checked regularly. Further information on each of the projects delivered has been published on the [ENA Smarter Networks Portal](#).

The opportunity to deliver incentive applicable Collaborative Streetworks projects in our Eastern network is much smaller as only a small proportion of the network covers the London region, and whilst we pursued a number of opportunities to collaborate, the projects did not follow through to delivery in 2022/23.

Supporting customers in vulnerable situations

Vulnerability and Carbon Monoxide Allowance (VCMA)

Our social impact forms a key part of how we do what we do – making life easier, fairer, and greener for our customers and colleagues. The past three years have really shown how vulnerable society is, first with the COVID-19 pandemic having significant consequences on the economy and now with inflation and rising energy bills impacting households across the UK.

Given this environment, we are proud in how we have significantly scaled up our support to maximise our impact with groundbreaking initiatives such as Centres for Warmth which has been vital to the communities we serve. We have focussed our efforts and funding to support more customers in fuel poverty. This revised approach allowed an increase in the number of cost of living and fuel poverty focused projects which we could mobilise quickly to ensure that the maximum support could be provided.

We have invested £9.3m of the VCMA over the first two years of RIIO-2, delivering a Social Return on Investment of c.£193m (equivalent of £21 for every £1 we have spent). This investment has supported customers with a wide range of innovative and effective services to increase awareness of the dangers of Carbon Monoxide poisoning, reduce fuel poverty and identify individual needs and joining up services to meet these.

In 2022/23 we originally committed to spend £4.9m in 2022/23. However, we increased our forecast to £6.3m to allow us to increase our fuel poverty focused initiatives, and our actual spend was £6.4m (an increase of £0.1m compared to our increased forecast). We focused on national projects and campaigns through the collaborative allowance and local partnerships through our individual company funding. Our local approach has been a success and allowed us to reach customers most at need through initiatives such as Centres for Warmth, Mobile Warm Hubs, regional Citizens Advice partners and other smaller partners and organisations.

We were already forecasting to invest over c.£30m through the VCMA during RIIO-GD2 to support customers in vulnerable situations. However, with a significant amount of the FPNES allowance likely to go unspent due to changes in support schemes for first time heating, we have worked with Ofgem and GDNs on

repurposing these allowances to the VCMA. As such, we are now able to invest around £85m of the VCMA during RIIO-GD2 to support customers most in need within the communities we serve, and we have submitted a robust strategy to Ofgem that details how we will significantly ramp up investment to do this.

	2021/22	2022/23	2023/24	2024/25	2025/26	Total
	Actual		Forecast			
Cadent specific fund	2.1	4.1	7.1	23.5	22.8	59.4
Collaborative fund	0.8	2.3	2.5	7.3	12.7	25.6
Total VCMA	2.9	6.4	9.6	30.8	35.4	85.0

Table 5.17: VCMA Actual and Forecast spend over RIIO-GD2

Our vulnerability strategy is built around four key priority areas; Tackling fuel poverty, Carbon monoxide awareness, Identifying individual needs and joining up services, and Going beyond the meter to never leave a customer vulnerable without gas. Our [2022/23 VCMA Annual Report](#) provides detail on how we have performed against these priority areas, however in the next sections we provide some insight, including performance against the consumer vulnerability reputational incentive measures.

Tackling fuel poverty

We are mindful that all of our customers are facing challenges as a result of the increase in energy prices and inflation. We have worked hard to reach as far as we can by offering energy and income advice and investing in community level and household level interventions to provide practical advice and directly improve household energy efficiency. We focused our efforts on helping people across our communities to heat their homes more affordably. We've seen the number of households we serve living in fuel poverty nearly double and we're now overseeing over 70 individual projects with a combined value of over £10m (in 2022/23) which will deliver a further anticipated social return of well in excess of over £200m. Several of these initiatives focus on the provision of tailored, professional, face-to-face energy and income advice to families most in need. We offer this in people's homes, but we reach more households through our expanding network of Centres

for Warmth to support local communities. These are unique to Cadent, where we fund professional resources to provide a range of financial and safeguarding support. We have established over 50 centres, helping over 25,000 households this year. The average household is between £2,000 and £2,500 better off as a result; resulting in at least £50m of benefit to some of the most vulnerable customers across our network.

Fuel Poor Network Extension Scheme (FPNES)

As well as utilising the VCMA to support customers in fuel poverty, we also continued to provide essential support to a large number of households through the FPNES. In 2022/23 we delivered 1,136 Fuel Poor Connections and in total over the RIIO-GD2 period to date we have delivered 4,405, which equates to more than 70% of the five-year period target of 6,250.

Network	FPNES connections delivered over RIIO-GD2	Period target	% Delivered vs. target	Cap	% Delivered vs. cap
EN	1,730	2,050	84%	2,446	71%
LN	478	500	96%	639	75%
NW	1,033	2,250	46%	1,909	54%
WM	1,164	1,450	73%	2,003	53%
Cadent	4,405	6,250	70%	6,997	63%

Table 5.18: RIIO-GD2 FPNES connections delivered vs. annual targets and cap

Changes to industry policy resulted in a drastic decrease in the availability for first time gas central heating (FTGCH). This had a significant impact on the deliverability of FPNES connections as customers are required to have access to in-home gas appliances and systems in order to qualify for the scheme.

However, despite these challenges, FPNES continued to form a key part of our "whole house" strategy for supporting customers living in fuel poverty. We maintained our work with partners and key stakeholders to continue to deliver FPNES connections at scale.

Carbon monoxide awareness

We use sophisticated data analytics to target households most at risk of carbon monoxide (CO) poisoning and this year we have delivered carbon monoxide safety classroom-based training to over 80,000 children attending schools in areas we've identified as most at risk. We have helped to embed our 'Safety Seymour' and 'The CO Crew' school education programmes into the other GDNs, and we're now sharing our Climate Genie project, which uses Minecraft to increase student engagement, across the industry.

We continue to measure CO awareness through a common survey which is completed on emergency jobs by our first call operatives as well as through our partnerships. The survey captures evidence of conversations on CO with our customers and allows us to demonstrate the pre and post CO knowledge. Of the 62,825 customers that have been surveyed in 2022/23, we have seen an average increase in knowledge of 3.15 points (out of 10), which is a 1.35 points increase since last year.

Our focus for 2023/24 is to continue to drive awareness of CO across networks with a focus on customers living in vulnerable situations in areas of deprivation.

	EN	LN	NW	WM	Cadent
Average score before	4.86	4.88	5.70	5.52	5.24
Average score after	8.41	7.89	8.67	8.58	8.39
Average score difference	3.56	3.00	2.96	3.06	3.15
No. of customers reached through CO awareness	1,184,421	633,649	782,684	567,591	3,168,345

Table 5.19: 2022/23 CO awareness survey scores and reach

Identifying individual needs and joining up services

We continue to chair the cross industry Safeguarding Working Group, which seeks ways to improve the process of raising awareness and registering customers on the Priority Services Register (PSR). There are around 3.9 million households living in our network who are registered on the Priority Services Register (PSR).

The PSR is a way that we can help those who have extra communication, access, or safety needs to always gain equal access to the best possible service. Over the course of this year, we have had over 250,000 face-to-face PSR conversations. Through our collaborative winter campaign which targeted PSR awareness, we estimate we have reached around half of the customers in our network, and we've seen the number of registrations increase as a result.

Our ongoing commitment to support customers in vulnerable situations is reflected in the scores provided by Priority Services Registered customers, who gave us an average of 9.34 out of 10. Our PSR customers scored us higher on average in all four of our networks compared to CSAT for all customers.

Network	PSR CSAT score	Difference vs. all customer CSAT
EN	9.33	+0.12
LN	9.22	+0.17
NW	9.39	+0.12
WM	9.35	+0.15
Cadent	9.34	+0.14

Table 5.20: Average PSR CSAT by network across all surveys:

Going beyond the meter to never leave a customer vulnerable without gas

In keeping customers safe, it is occasionally necessary to isolate the gas supply from a particular household appliance or even the whole house. We recognise this could leave customers in a vulnerable situation, so we've created a process whereby we use our own trained engineers to complete a range of technical assessments and interventions to get customers back on gas after we've identified a safety related fault in their home. We have also expanded our One Number Referral process, where engineers can refer a customer in a vulnerable situation to our partners, National Energy Action and Groundworks UK, for additional funded support. This year we've referred thousands of households, with many benefiting from replaced or repaired appliances, among a range of additional benefits. As we expand this service, we have invited other GDNs to do the same, using the collaborative VCMA allowance. Northern Gas Networks joined us, using our

dedicated training centre at Hollingwood (in the North West of England) to upskill their engineers.

Case study: Energy efficiency campaign to reach more than 1m customers

In November 2022, we launched a campaign to provide households across our network with advice to help them reduce their energy usage to save money over the winter period.

Having undertaken a comprehensive customer research programme called the Energy Diaries, which helped us understand how customers used their home energy pre and post the energy price increases in April 2022, we invited them to join us at workshops. Along with experts from charities and customer advocacy organisations such as Citizens Advice and National Energy Action, we used these workshops to cocreate solutions designed to support customers through the cost of living crisis.

While numerous ideas were generated, the most important insight was that customers wanted free, impartial, simple advice that they could easily follow to reduce their energy consumption and thereby their bills. This insight inspired our campaign and we worked with customers and a specialist campaign management organisation to develop a suite of material that we shared on national radio, billboards, posters, social media, our website and leaflets.

The campaign reached more than one million households, offering advice that could potentially save each customer over £100 per year, with simple tips such as keeping the lid on pans when cooking, turning down the thermostat and encouraging everyone to “switch on to switching off” when it comes to household appliances.

Personalising Welfare Facilities

The Personalising Welfare Provisions PCD is a bespoke output that was introduced for us in RIIO-GD2 to support customers in vulnerable situations (for those registered on the PSR and not) with enhanced ‘personalised welfare’ when their gas supply has been interrupted, beyond the minimum requirements under GSOP 3.

Our provision of personalised welfare products and services has increased significantly from last year, with 23,146 customers benefiting – a 261% increase from 2021/22.

	EN	LN	NW	WM	Cadent
Provisions to PSR customers	3,960	3,670	3,181	3,002	13,813
Provisions to non-PSR customers	1,504	4,899	1,304	1,626	9,333
Total	5,464	8,569	4,485	4,628	23,146

Table 5.21: Number of personalised welfare facilities provided in 2022/23

This improvement is based on the embedding of our Safeguarding Strategy and the initiatives we implemented last year to establish a foundation, including the widescale training of our customer facing colleagues and the research and development of new products and services that are based on the bespoke needs of customers. We also continue to develop our Additional Welfare Decision Tool (AWDT), which helps our front line engineers to identify which welfare products and services to provide.

Given the increased cost of energy, one of the most popular products this year with a significant level of take up are food vouchers. Whilst we offer alternative cooking equipment, many customers prefer vouchers as they can avoid the additional costs of running the alternative cooking equipment and, knowing that an outage will be relatively short, do not wish to be left with additional equipment. Whilst vouchers are provided through popular food-delivery websites and applications, we have also been working to extend this offer for those who may find themselves digitally excluded or living in rural areas where food voucher usage can be restricted. For example we have introduced partnerships with

companies such as Parsleybox who deliver predominately to a demographic of pensionable age in rural settings. This delivery contains prepared and healthy meals which are easy to heat in a microwave.

Supporting the cost of living crisis, we have developed and put into place a new offering helping to cover the running costs of any electrical welfare items for the off-gas period. This has been well received by customers and a more proactive way of communicating this offer to customers will be embedded next year, ensuring our personalised welfare items are accepted and utilised to support customers keeping safe, comfortably warm and independent in their homes in an off-gas situation.

With the improvements that have been progressed across all parts of the business this year and newly implemented enablers, we have real confidence that the targets set for the PCD are very achievable. In 2023 we will formally contract with an organisation that has an expertise in logistics who will help us significantly increase the extent of products and services we can deliver, utilising their expert software (for determining need, ordering stock and recording actions) rather than our own. We expect this to be fully operational by mid-2023 and as a result our Personalised Welfare provision increasing by a further 300%. With a rich portfolio of relevant products and a logistics strategy to deliver consistently across all networks, we expect to embed a best-in-class service next year to support all PSR and customers in vulnerable situations when off gas due to our works.



Tackling Climate Change and improving the environment

Decarbonising our business operations

Environmental emissions and shrinkage

Shrinkage is gas that leaves our network without passing through a meter. While not physically measured, it is modelled and estimated using an Ofgem approved methodology. Shrinkage includes gas that leaks or is vented from our system (leakage), gas that is used for our operational purposes, for example, preheating gas prior to pressure reduction (own use gas) and gas that is stolen upstream of the meter (theft of gas). Leakage is the largest contributing factor of greenhouse gas emissions from the gas transportation network and contributes to global warming.

Across our four networks shrinkage gas losses were reduced by 43.1GWh (4.0%) with reductions achieved in all four of our networks. Based on an assumed typical annual consumption of 12,500 kWh, this reduction is equivalent to the gas usage of approximately 3,450 domestic houses.

We continue to see the biggest reduction in our year on year emissions coming from the delivery of the mains replacement programme which replaces ageing metallic pipes with polyethylene. This contributed 39.3GWh of the overall performance.

We projected our average system pressures to be flat over the course of RIIO-GD2, however operational impacts or exogenous factors, for example weather, can impact them. We experienced higher average system pressures in 22/23 when compared with 21/22 and this contributed a 1.2 GWh increase in shrinkage.

Within each of our networks we still have a significant amount of low pressure iron mains that have lead and yarn joints. These joints are treated using Monoethylene Glycol Saturation (MEG) which reduces the rate at which gas leaks from them. A proportion of lead yarn jointed pipe is replaced annually with polyethylene pipe as part of our mains replacement programme. We are committed to the ongoing treatment of lead and yarn joints as this positively impacts gas Leakage and

contributes to keeping our customers safe. In 2022/23 our overall MEG saturation increased from 35.7% to 40.0% compared to 2021/22, as a result of this our emissions decreased by 5.3GWh compared to last year.

	EN	LN	NW	WM	Cadent
2021/22 Shrinkage Outturn (GWh)	380.7	195.0	268.3	244.9	1088.9
LP / MP Mains Replacement	(8.9)	(5.5)	(6.8)	(5.0)	(26.1)
Service Relays	(4.5)	(3.1)	(3.5)	(2.2)	(13.2)
Average System Pressure (ASP)	2.9	(0.2)	0.1	(1.6)	1.2
Monoethylene Glycol Saturation (MEG)	(0.4)	(2.3)	(3.1)	0.6	(5.3)
Interference Damages	0.9	(0.1)	1.0	(0.1)	1.8
Own Use Gas	(0.8)	(0.4)	(0.5)	(0.3)	(2.0)
Theft of Gas	(1.4)	(0.7)	(0.9)	(0.5)	(3.5)
AGI Asset Numbers	0.1	(0.0)	0.0	(0.3)	(0.2)
2022/23 Shrinkage Outturn (GWh)	370.4	183.9	256.2	235.3	1045.8
Year on year reduction (GWh)	(10.3)	(11.1)	(12.2)	(9.5)	(43.1)
% Reduction	-2.7%	-5.7%	-4.5%	-3.9%	-4.0%

Table 5.22: 2022/23 Overall Shrinkage performance

Since 2012/13, our Shrinkage volumes have reduced by 464.8GWh (31%) compared to our opening baselines. This is the equivalent to the gas consumption of approximately 37,180 homes. The graph below shows our performance compared to baselines and our forecast performance over the remaining years of RIIO-GD2.

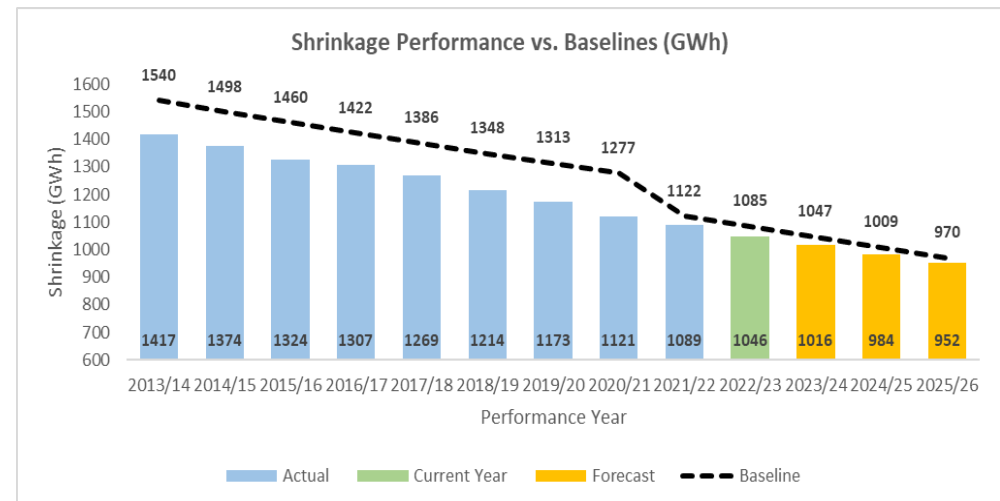


Figure 5.23: Shrinkage Performance vs. Baselines (GWh)

During 2022/23 we have been leading on a SIF project looking at how we develop our shrinkage modelling further (the Digital Platform for Leakage analytics – DPLA). We are delighted that this has been recognised and will now proceed to Beta funding. This will allow us to revolutionise both how we measure the impact of our network and to target more impactful interventions over and above mains replacement. (Further detail in the innovation chapter on [page 30](#))

Zero emissions commercial fleet

In support of our ambition for decarbonisation, in our business plan we committed to have a zero emissions first responder vehicle fleet by the end of the RIIO-GD2 price control. Through the Commercial Fleet Price Control Deliverable (PCD), Ofgem provided us funding for the procurement of 999 large electric vans, for our FCOs, and the installation of 401 EV (Electric Vehicle) charging points across our four networks.

Since submitting our business plan the commercial EV fleet market has grown rapidly with many new models becoming available that would meet the needs of our First Call Operatives (FCOs). As such, we have engaged with Ofgem to update Special Condition 3.13 within our Gas Transporter licence to enable us to procure

cheaper medium vans rather than large vans to deliver our commitment. This adjustment to our strategy will enable us to return around £4m of allowances to customers via the PCD mechanism (with no financial benefit to Cadent).

In 2022/23 we purchased 411 EVs, resulting in a total of 441 EVs purchased over the RIIO-GD2 period to date. EN (23% over) and WM (18% over) are delivering over the straight profile, whilst LN (9% under) and NW (26% under) are below. Whilst our procurement of EVs in 2021/22 was relatively low as we were identifying optimal vehicles for our FCOs, delivery has now accelerated across all networks, and we expect to meet our period target of 999 zero emission vehicles by the end of RIIO-GD2.

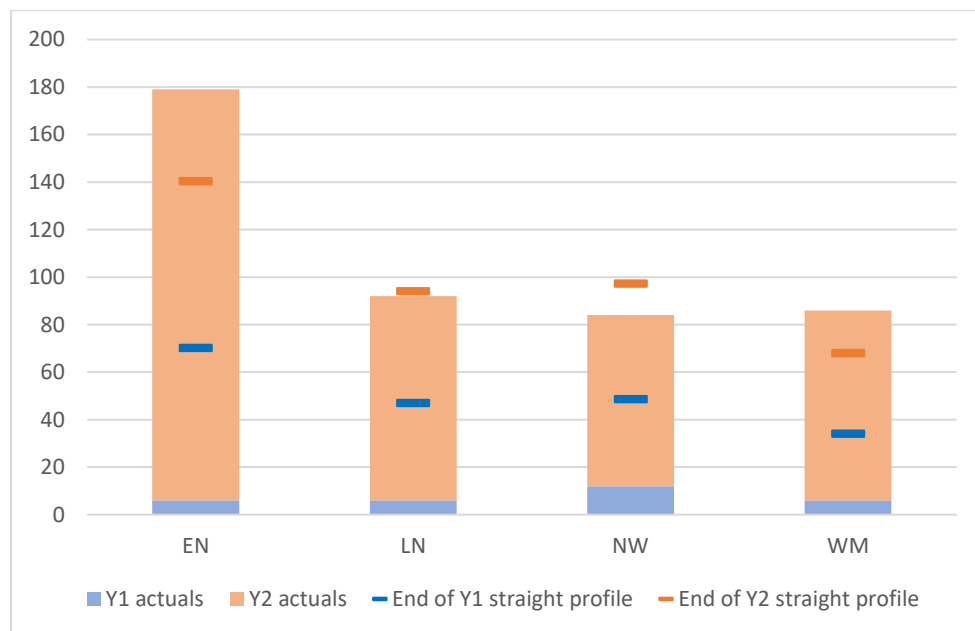


Figure 5.24: RIIO-GD2 Commercial EV Fleet purchased

In 2022/23 we also installed 195 EV charging points, resulting in a total of 225 charging points over the RIIO-GD2 period to date. All our networks are delivering

above the straight profile, and we expect to achieve our period target of 401 charging points by the end of RIIO-GD2.

	EV Charging Points installed in RIIO-GD2 to date	End of Y2 Straight profile	% installed vs. straight profile
EN	99	56	176%
LN	42	38	111%
NW	46	39	117%
WM	38	27	140%
Cadent	225	161	140%

Table 5.25: RIIO-GD2 EV Charging Points installed

The conversion of our fleet is done over time as our vehicles are leased and their contracts end at different points over the RIIO-GD2 period. Conversion to zero emission vehicles is completed once a contract for a vehicle has ended and requires replacement. We have adopted a leasing strategy to purchase zero emission commercial vans as this generates the most value to Cadent and our customers, allowing us to keep pace with the progressing zero emission vehicle technology in the market.

Business Carbon Footprint

Whilst the majority of our greenhouse gas (GHG) emissions are from shrinkage, we have other significant sources that stem directly from our energy consumption (gas and electricity), fuel use and indirectly from our supply chain. We define this as our scope 1, 2 and 3 business carbon footprint (BCF).

Our Environmental Action Plan (EAP) includes targets for reducing our BCF over RIIO-2 and individual environmental commitments to achieve this. In 2021/22 we published our first Annual Environmental Report (AER) that details our performance against our commitments in the EAP and how we are improving environmental reporting methodologies.

In 2022/23 we have seen a 2% reduction in our BCF (excluding shrinkage) from 2021/22, however we are above our emissions target by 15,267 tCO₂e. As part of our commitments to reduce our environmental emissions, we have implemented a programme to improve our scope 3 reporting over RIIO-2, which includes the introduction of a new carbon reporting tool for our supply chain. As a result of this we have seen an increase in scope 3 emissions, largely attributed to contractor vehicles which comprise 83.12% of the scope 3 emissions.

We have reduced our scope 2 emissions by 17.8% compared to 2021/22 and committed at the start of RIIO-2 to reduce our energy consumption and procure 100% renewable energy.

The total 2022/23 scope 1 emissions were 25,459.37 tCO₂e, a 2.4% decrease compared to 2021/22. The decrease was seen across most scope 1 reporting categories, predominantly own use gas, gas consumption and commercial fleet. Some of our environmental programmes will take time to see an effect in our BCF, for example our conversion of commercial fleet vehicles to zero emission equivalents will reduce our scope 1 emissions. The rollout plan will see the majority of conversions occurring in the second half of the price control, hence, we will see the greatest impact on our BCF in the latter part of RIIO-2.

BCF (tCO ₂ e)	21/22	22/23	Year on year % change
Scope 1 and 2 excl. shrinkage	31,623	30,005	-5.1%
Scope 1 and 2 incl. shrinkage	1,276,328	1,227,883	-3.8%
Scope 3	31,655	32,264	1.9%
BCF excl. shrinkage	63,279	62,268	-1.6%
BCF incl. shrinkage	1,307,984	1,260,147	-3.7%
Emissions Target excl. shrinkage (based on Business Plan)	47,976	46,526	

Table 5.26: BCF performance

Trusted to act for our communities

The Cadent Foundation

This past year has shown that the projects we fund are unfortunately more critical than ever, as the ongoing cost of living crisis has left millions of people facing impossible choices every day. With spiralling demand on the charitable sector, we wanted to do more, but in a way that ensures our funding is going to where it can help the most. With this in mind, we launched a new vision and ambition for the Cadent Foundation, centred around tackling the root causes and impact of fuel poverty within our communities.

With an estimated 7.5 million UK households unable to afford to heat their homes to the temperature needed to keep warm and healthy, fuel poverty is one of the greatest issues our society faces today. We believe this is where our Foundation can make the greatest positive difference.

We awarded more than £2.9 million to support some amazing charities doing tremendous work in very challenging times. Through our partnerships we have helped to deliver in-depth, tailored energy advice; installed thousands of energy-saving measures to make homes more energy efficient; facilitated access to grants and schemes for larger home improvements and helped people have more money in their pocket through income maximisation and debt services.

We want to amplify our social impact by enabling better access to services, driving innovative new solutions to help people make their homes easier and more affordable to heat, and developing best practice models which remove barriers and give organisations the flexibility to tackle fuel poverty in the ways that work best, ensuring we can get help to those who need it the most. As part of the Foundation's transition to focusing on fuel poverty, new data gathering processes have been developed to provide greater insight into how we measure our impact and delivery. This has proved invaluable, demonstrating the positive benefit of partnership working and the need for targeted, energy efficiency interventions to secure long term, sustainable solutions to fuel poverty.

Employee volunteering

Our charity partnership with Emmaus has prompted renewed commitment to volunteering efforts with our colleagues showing commitment and dedication to their chosen projects over the last twelve months. Through a range of employee engagement activities, our employees understand the contribution they can make and are actively encouraged to participate to the fullest extent they can.

We raised over £160,000 and supported with over 640 days of activity. 60% of colleagues gave back to our communities through volunteering with teams across the business coming together and working as an extended family within communities, working in schools, on community projects and adding much needed support on the doorstep.

A diverse and inclusive workplace

We are committed to an organisation design that will enable the achievement of our commitments for RIIO-2 and beyond, ensuring that we have the right people in the right place at the right time. We are driving a direct labour model while working closely with our supply partners to provide opportunity and growth for our colleagues.

Our CEO, Steve Fraser, was interviewed by the Tackling Inclusion & Diversity in Energy (TIDE) taskforce, an industry-wide initiative to improve inclusion and diversity across the energy sector, supported by Energy UK, Energy Networks Association, the Energy Institute and Ofgem. They were so impressed with Cadent's commitment to EDI that they asked for a summary of the work we are doing, which has been shared with Ofgem. Ofgem were equally impressed with our work in this area and recognised us as the Networks leader, and top class in our industry. They have asked us to share our best practice with other organisations in the hope that we can inspire them to make similar progress.

Our ED&I Steering Group sets our strategic direction for ED&I, and the senior leaders who sit on the Steering Group sponsor and support our employee communities and our three ED&I working groups. These working groups aim to deliver real change and include members from all over our business and our communities, to ensure changes are positive for everyone. Our working groups drive progress in three areas: anti-racism, inclusive leadership and fair and inclusive processes.

Cadent's key achievements on ED&I in 2022/23

Accredited as Menopause-friendly and Fertility-friendly Employer

We're proud to have become accredited as a menopause friendly employer and a fertility friendly employer. In particular we have made significant progress in supporting those undergoing the menopause and fertility treatment, having introduced policies and e-learning on both topics.

Supporting colleagues with Disability and Neurodiversity

We have retained our Disability Confident Employer status and have also conducted a thorough neurodiversity review with Lexxic, receiving accreditation as a 'Neurodiversity Smart: Committed' company. We started working towards a recognised inclusion standard, "Clear Assured" and are pleased to have recently been awarded the Bronze standard.

Executive action on diversity and inclusion

Our executive committee have created their own ED&I Action Plan which focuses on tangible, outcome-focused actions which will have a real impact, specifically where our senior leaders can make the most difference. These actions include ensuring we develop an ED&I plan within each function of the business, reviewing the diversity and representation at committees annually, and seeking to have a diverse pool for all senior leader appointments.

Reporting and acting on our ethnicity and gender pay gap

This year we reported our ethnicity pay gap for the first time, as part of our ongoing commitment to transparency and to improving outcomes for underrepresented groups. We recognise that we have an ethnicity pay gap, and we're confident that the work we are doing in all areas of our business will help us to achieve this.

We are pleased that our gender pay gap for 2022 has reduced compared to 2021 across all key measures. We understand that there's more to do, and we are committed to achieving gender parity. This year we started a partnership with the Women's Leaders Association to support and develop women in our business.

6. Innovation

We are committed to deploying and supporting innovation across our footprint; firstly, by ensuring we support the UK's energy transition to net zero, secondly, by supporting our customers in vulnerable situations and thirdly, by ensuring our localised operating model continues to improve our operational efficiency.

We currently have three allowances to be drawn upon from an innovation perspective including:

- The Strategic Innovation Fund (SIF)
- The Network Innovation Allowance (NIA)
- The Net Zero Development funds (as explored below).

We have outlined below the key areas and projects which have utilised these funding mechanisms to enforce innovation across our networks.

We also explain the progress we have made on the Hynet Front-End Engineering Design and how we are continuously supporting industry, transport and power generation sectors.

The Strategic Innovation Fund (SIF)

The Strategic Innovation Fund (SIF) is designed to drive the innovation required to equip the gas network for a low-carbon future. 2022/23 was the second year of SIF under RIIO-2, and our first project commenced in March 2022, with no costs incurred until April 2022. Over the last 12 months we have invested £0.47m over the Discovery and Alpha phases of the SIF cycle through the Digital Platform Leakage Analytics project.

Digital Platform Leakage Analytics (DPLA)

Drastically reducing leakage across gas infrastructure is a global challenge that must be addressed to achieve the Global Methane Pledge and Net Zero targets by 2030 and 2050, respectively. Currently, GDN emission reporting requirements, provide only static, theoretical values of total gas leakage, not identifying actual leak locations or volumes. Hence, the DPLA is an innovative approach to utilise

digital technology and data to provide an accurate view of leakage across our gas network. This is expected to enable efficient operational and investment decisions to reduce leakage, improve network safety and reduce customer bills.

The Discovery phase assessed a range of technologies for methane detection and concluded that a mix of technologies would be required to provide a whole system view. This includes handheld and drone mounted sensors for above ground installations (AGIs), vehicle and drone mounted sensors for urban pipelines, and vehicle, drone and aircraft mounted sensors for rural pipelines.

During the Alpha phase, the project undertook activities and mitigation actions that aimed to reduce the likelihood and impact of risks occurring. Broadly, we aimed to gain higher levels of confidence regarding; the benefits achievable by the solution across GB networks, the cost of implementing the digital platform and associated technologies, and the ability to overcome regulatory changes that enable the roll out of the solution.

As lead partner, we are responsible for the successful delivery of the project. Project partners from the Discovery phase: Cadent, SGN, NGGT and Guidehouse were joined by NGN and WWU for the Alpha phase. The participation of these parties will enrich the project with a complete beach to meter view of national gas network emissions.

Network Innovation Allowance (NIA)

The Network Innovation Allowance (NIA) is intended to fund projects with the intention of supporting both customers in vulnerable situations and the energy transition to net zero. 2022/23 was the second year of Network Innovation Allowance (NIA) funding under RIIO-2 and over the last 12 months we have invested over £2.94 million through 26 projects.

We currently have five projects ongoing which work to support customers living in vulnerable situations. Below outlines some examples of the work we are currently committed to.

Low Power Hot Water

The project commenced in April 2022 alongside Haydale Ltd. The project aims to find an alternative solution to the current hot water heating appliances provided when gas supply is interrupted for PSR customers. Haydale Ltd are an advanced

materials company that specialise in the commercialisation of functionalised nanomaterials and silicon carbide. They offer a potential low power usage solution to heat water in domestic premises which can be easily adapted into different designs, using a Graphene Ink Based heater.

To date within the project we have established:

- Two products would be required, one for the bathroom and one for the kitchen. This removes the need to move products between rooms, reducing the risk of customer injuries.
- Products would need to be powered by rechargeable battery, keeping customer costs to a minimum.
- Products should be a minimum of 5 litres in capacity.
- A CAD design of solutions for both bathroom and kitchen, with a prototype going into production in May 2023.

This potential solution will enable customers in vulnerable situations to keep warm, wash, clean and live independently, while also remaining cost effective, ensuring customers are not impacted by rising energy costs.

Easy Assist Remote Actuation

The project follows on from the EasyAssist™ ECV project, which enabled customers to press a button to close the ECV rather than turn the handle. The Remote Actuation project will go one step further, allowing gas meters in inaccessible locations to be isolated by installing a push button attached to a cable, up to 2m away from the ECV.

The project commenced in November 2022 and to date, we have approved a specification document, developed early prototypes, and drafted an Alpha Prototype test plan.

Digital Exclusion

Working collaboratively alongside Energy Catapult Systems, NGN and National Grid Electricity Transmission, the research project aims to establish how energy networks can best communicate with customers who find themselves digitally excluded, either through personal choice or poor digital connection. It is estimated

around 20% of the population are digitally excluded, hence potentially missing key communications regarding interruptions and future service changes to meet the UK's Net Zero ambition.

The project commenced in February 2023 and work is ongoing to establish an engagement plan. We aim to commence stakeholder interviews in April 2023 and hold workshops in June 2023 to establish best practice and inform the ongoing course of action.

Supporting the transition to Net Zero

Over the course of the year, 21 projects utilised our NIA allowance in support of the whole system net zero transition. 5 of these projects commenced in 2021/22 and are now completed, and 16 were new projects, with some continuing into 2023/24.

Several of the projects were focused on the Hydrogen Village collaboration. Following a request from DESNZ, a programme of projects to be delivered by the gas networks in support of both of Whitby and Redcar hydrogen village projects were agreed. The projects aimed to address any remaining safety evidence gaps ahead of the village trials. We oversee the programme and have taken a lead on the End User Safety Evidence elements. The projects outlined below explore and assess the consumer, technical and safety requirements of integrating hydrogen into the energy system.

- End User Behaviour – Impact on Safety (NIA_CAD0083)
- Conversion Strategy – Pipework (NIA_CAD0081)
- Use of Automatic Isolation Valve (AIV) Systems with Hydrogen - AIVs in LP and MP Services (NIA_CAD0082)
- Implications of Hydrogen Purity (NIA_CAD0084)
- FI-0026 Ignition Consequence - Explosion Risk Assessment (NGN_NIA_344)
- FI-0033 HyLights (NIA_CAD0087)
- Hydrogen Village Safety Framework (NIA_CAD0080)
- Appliance Supply Chain programme (NIA2_SGN0026)

- Exit Strategy Mechanism (NIA_CAD0078)

We also delivered two projects focused on blending hydrogen into our existing network. The projects focused on the functional specification of both hydrogen blending infrastructure and the commercial frameworks required. Both projects are now complete, and the outputs will support the government decision for hydrogen blending in expected 2023.

There have also been a number of EIS Network Safety Integrity Board (NSIB) Programme activities. Various collaborative projects have been commenced during 2022/2023 supporting the R&D required for the use of Hydrogen for heating. The projects have focused on the safety evidence such as Atex Equipment and the wider impacts of the transition to Hydrogen. We also collaborate with National Grid on three projects which provide access to a programme of Hydrogen research.

Further details of NIA projects can be found in our RIIO-2 Year 2 Innovation Report (which will be published at the end of July)

Net Zero Development Allowances

Under RIIO-GD2, Ofgem have included three funding provisions to support net zero activities; the net zero pre-construction works and small net zero projects (NZASP), the net zero and re-opener development fund (UIOLI) and the net zero re-opener. The allowances provide funding to deliver projects which sit outside of NIA funding, yet work towards providing low-carbon, environmental benefits to customers. In 2022/23, we have accessed two of these three funds including the UIOLI and NZASP allowances.

Net Zero and reopener development (UIOLI)

To date, we have utilised £3.74m of our £19m allowance over RIIO2. This year has seen an increase in spend in comparison to the previous year, as our regional development projects have developed from initial feasibility studies through to technical feasibility and pre-FEED stages. This increase in spend is expected to continue across RIIO2 as regional projects are introduced and progress.

We have utilised the UIOLI allowance to fund 12 projects over the 2022/23 period, which include:

- East Coast Hydrogen (ECH2) Technical Feasibility

- East Coast Hydrogen prospecting work
- East Coast Hydrogen secretariat services
- East Cost Hydrogen Pre-FEED
- Capital Hydrogen Feasibility study (Capital H)
- Capital Hydrogen technical feasibility
- Hydrogen Valley feasibility
- System Transformation Modelling Iteration 1 and 2 (BEIS system transformation programme)
- Hydrogen Town feasibility (optioneering)
- HyNet Phase Ib
- Future Energy Scenario Modelling (phases I-IV)
- Early Modelling support for new hydrogen clusters

During 2022/23 we had four projects supporting the East Coast Hydrogen programme. These have built upon the initial feasibility study undertaken in 2021/22. A technical feasibility study has been undertaken over the past year, which is now informing the next stage of the project, a Pre-FEED, which involves the initial Front-End Engineering and Design for the pipeline. The pre-FEED will determine the optimum pipeline routing and sizing to meet customer demand.

National Gas and Northern Gas Networks will also be running their own East Coast Hydrogen Pre-FEED studies, with the combined outputs from the Pre-FEEDs being pulled together by the East Coast Hydrogen Secretariat (project ref: NZEA0007). This will feed into the creation of a Deployment Strategy for a new and re-purposed hydrogen pipeline for the whole of the East Midlands and North-east Gas networks regions.

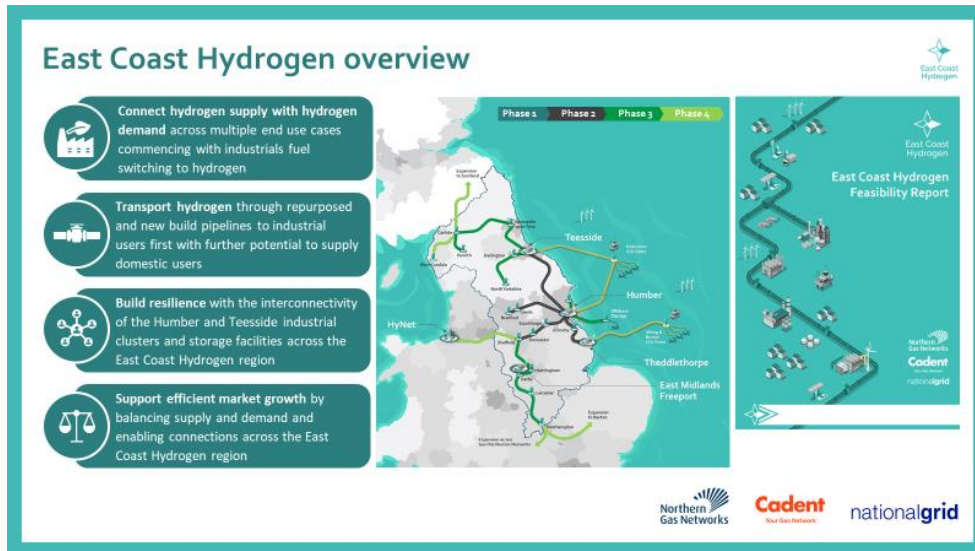


Figure 6.1: East Coast Hydrogen overview

We have also undertaken work on two further regional development projects, Capital Hydrogen and Hydrogen Valley:

In 2022, we began a new regional development programme, in partnership with SGN and National Gas, called Capital Hydrogen. The programme seeks to explore how to convert the gas networks of East of England, the Southeast and London to hydrogen. The initial step has involved a feasibility study, which identified; how much hydrogen may be needed in London over the next 30 years, where it could be produced and stored, how it would be transported and the benefits would be of such a programme.

The Hydrogen Valley Feasibility Study (Project ref: NZWM0002) in collaboration with National Gas, started in July 2022 and ended in March 2023. The project assessed the vision for hydrogen across the West and East Midlands, and the steps necessary to achieve it. The project forms the first stage of a multi phased programme to enable hydrogen usage in the region. It seeks to link up with other hydrogen infrastructure developments (HyNet, East coast Hydrogen, Bacton and Project Union etc.) to optimise the opportunities in the area and identify the clusters of industry that may require hydrogen in the near term.

In support of the Government's 10-point plan (published in 2020), we have also delivered a short optioneering, feasibility project for a town conversion to hydrogen. As part of this project, we have proposed two towns across our footprint which would be ideal candidates. We await the decision from DESNZ as to if both towns will progress to the next stage of the project.

Net Zero Pre-construction works and small projects fund

At the start of 2022/23 we were given the go ahead to progress one of two village conversion projects to the next stage of planning. The Hydrogen Village Conversion - Stage 2 project is the only project which utilises the NZASP funding in 2022/23.

Hynet Front-End Engineering Design (FEED)

In May 2022, we submitted to Ofgem our revised Engineering Justification Paper (EJP) which sets out the progress that we have made to date on the HyNet Front-End Engineering Design (FEED) and successful application for a Developmental Consent Order (DCO) from the Secretary of State for the HyNet Phase 2 Hydrogen Pipeline, which is deemed a Nationally Significant Infrastructure Project.

The principal organisations within this consortium are contributing to the hydrogen elements of the scheme (owner / operator, designer, construction). We are responsible for providing the dedicated hydrogen distribution system as part of Phase 2 of the overall project - the HyNet Phase 2 Hydrogen Pipeline.

The project acknowledges the potential for further network expansion as part of Phase 3, consistent with the hydrogen production programme. Such network expansion would involve extension of the Phase 2 network, and as such, would be a consideration when determining Phase 2 network capacity.

The strategic case for HyNet remains very strong, and this is recognised at all levels across Government. Hydrogen fuel is the only feasible decarbonisation option for many of the large industries in the North West. Without hydrogen, these industries will face extreme challenges in meeting their net-zero targets and may choose to relocate outside of the UK, with a significant impact on the economy if they do not have access to alternative energy supplies. Hydrogen at scale is also vital as a fuel for the dispatchable net zero power generation required to support the secure operation a net zero power system by 2035.

Cadent is now planning for the next post-FEED stage of the project, and have been in discussions with Ofgem and Government about the significant associated funding that will be required. These discussions are ongoing but are yet to identify a solution to the short term need for substantial levels of funding to ensure the infrastructure can be in place within the overall programme timetable our project partners are also working to.

In parallel, Government are developing the policy in the area of Hydrogen Transport and Storage. This will impact the HyNet project when the policy is rolled out, although this is not expected before 2025.

Serving industry, power and transport sectors

Approximately 33% of our current demand comes from industry, transport, and power generation. Over the past five years we've seen substantial growth in the power generation sector with 159 sites now connected to our network. Power generation sites provide the electricity market with the flexibility to manage demand spikes. Sites connected to our network are often designed as a bank of generators providing further flexibility and can typically be online within five to seven minutes.

We have 13 compressed natural gas filling (CNG) stations connected to our network, providing transport operators with the opportunity to substantially decarbonise their fleet by using biomethane that has been sourced from anaerobic digestion plants connected to our network. CNG vehicles running on biomethane emit less than 80% CO₂ in comparison to a diesel equivalent vehicle. Nottingham City Transport have also moved to CNG buses to provide public transport with a fleet of 120 buses running on biomethane from a local anaerobic digestion plant, saving 3.5 million KG of CO₂ per year.

Our network now has 42 anaerobic digestion plants connected, which provides biomethane to homes, industry, power generation, and transport. Biomethane is produced by fermenting organic matter, making use of feedstocks ranging from farm and animal waste to food and sewage waste, crops, and silage. The production and injection of biomethane into the gas grid offers a green and sustainable solution to waste management for industrial, commercial, and domestic users, while providing an additional green revenue stream. The 42 biomethane sites provide the equivalent of heating 272,467 homes annually. We're

expecting this to increase due to the Environment Act 2021 mandating the separate collection of household food waste by 2024/25. The introduction of the new Green Gas Support Scheme has provided the market with a sustainable financial and environmental future for biomethane to gas grid and has resulted in a renewed interest in the connection of further biomethane sites.

	13/14	14/15	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23
Connections	1	10	22	28	29	32	35	36	39	42
TWh actual	0.07	0.64	1.44	1.78	2.03	2.38	2.52	2.63	2.87	3.13

Table 6.1: Biomethane connections

