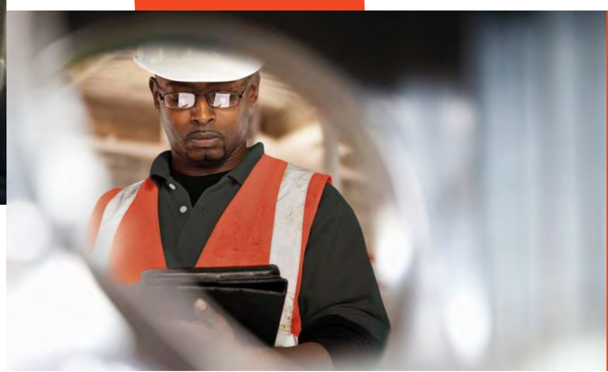
Cadent
Your Gas Network

Strategic Performance Overview

RIIO-1 Annual Monitoring 2018/19

July 2019



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1. Strategic Summary
CEO Update

Putting customers and communities at the heart of everything we do.

Our vision is to set standards that all of our customers love and that others aspire to.

We are seeking to set standards for our customers, stakeholders and communities that they will love and we have worked hard to engage and gather insight to deliver on our ambition.

Steve Hurrell
Interim CEO

Society's expectations of energy companies are constantly increasing and it is very important for Cadent to achieve a full alignment with our customers and deliver the standards they will love. Cadent operates the largest gas distribution network in the UK, providing essential service that keeps the energy flowing to over 11 million homes, offices and businesses. Cadent is now a standalone gas distribution business, with new ownership and a brand new identity. We have the opportunity to significantly transform and re focus the long history of custom and practice that we inherited to deliver for our customers and respond to their dynamic needs.

Under our new ownership, we are undertaking an unprecedented level of engagement with our customers and stakeholders across our regions to understand their priorities and we are using this insight to develop a business which meets their expectations. We have a very experienced board and have also established a highly skilled independent Customer Engagement Group to challenge us on the ambition of our plans and bring experience from different business sectors into our thinking.

Building on our research, we will set new standards on the quality of the services we deliver to all of our customers, stakeholders and communities, particularly those that find themselves in vulnerable situations. We need to develop a customer first approach that has an ethos of constantly maintaining availability of gas supplies to our customers by developing appropriate techniques and using innovative ways to achieve this goal. We will also push the boundaries on our role in supporting safety of customers in the home, helping alleviate fuel poverty and making our services more accessible to all types of customer.

We are driven in our desire to improve the environment and are taking a leading role in creating the vision of the transition to a sustainable energy system through our pioneering innovation projects. We will continue to focus on delivering an affordable service to current and future customers by driving the efficiency of the business. We also recognise that we need to deliver these outcomes in a way that builds trust in how we operate, making a real and sustainable difference to the communities we support. We will embrace the need for a wider social responsibility that delivers better, sustainable outcomes for all through collaboration and innovation. In addition, we will continue to be transparent in our operational and financial performance.

There is a long way to go until we achieve all of our strategic goals and the journey has only just begun. Our ambition is to transform the business and we want the customers to feel the benefits that this will bring. The cornerstone of our plan is to develop a real sense of community, both within Cadent and for the regions that we serve, by working more closely with them. We want to be a company that is known for being forward thinking, that delivers for all of its customers, particularly those in vulnerable situations – that recognises that without gas, all customers are vulnerable.

We are fully committed to delighting customers and bringing value and prosperity to the communities we serve. Actions speak louder than words and we are currently working on setting out our plans and the outcomes we are targeting to achieve in this pursuit of excellence, which will become available in December 2019**.**

A year in review

In 2018/19 our insights into current performance tells us we have significant improvements to make on costs and the quality of service to our customers. We are seeking to set standards for our customers, stakeholders and communities that they will love and have worked hard to engage and gather insight to deliver on our ambition. We have maintained our financial performance while operating within a new organisational structure and in the face of a challenging external environment.

Overcoming challenges

Since 2017/18 we have experienced significant challenges in respect to multi occupancy high rise buildings, in particular in our London network. We have taken action to address these issues and have recognised the impact of our performance through additional compensation payments. We have been working hard to transform the service we deliver to our regions and specifically in our London network where we have established a new team to improve the services for our customers. Following engagement with Ofgem and the HSE over the past year, we have committed to a customer experience improvement plan with short, medium and long-term action plans to reduce the volume of unplanned MOBs interruptions.

Transforming our business

We have worked hard over the last 12 months to engage, listen and learn from our customers. This has reinforced our plans to create a business that is more aligned to our four networks, which includes moving decision making closer to our customers and assets, improve efficiency and driving greater accountability for delivering better outcomes.

Moving our customer complaint resolution activity into our networks and local operating teams resulted in faster resolution of complaints by 66% compared to the previous year, and significantly reduced the cost of this activity. We have been working very hard with our partners to increase the pace and efficiency of our mains replacement programme. We have seen a solid start to improved performance in our London and East of England networks. We are at the beginning of this journey that is underpinned by a cultural and operational transformation and not all customers will have yet benefitted from these improvements and we must do better.

We have brought Operations and Construction directorates under the newly appointed Chief Operating Officer and aligned our Operate and Maintain function in each network under one director with our Emergency Response and Repair functions. As well as creating clearer accountability for operational delivery, these changes create the opportunity to be more flexible and efficient in the allocation of work across our operational workforce. For example, the Operations function commenced delivery of mains replacement projects in 2018/19, work that had previously been carried out solely by our Gas Distribution Strategic Partners. We will be progressively aligning our mains replacement programme with our networks as we transform our delivery model for this high intensity activity. We delivered a strong total expenditure performance for the year, with continuous improvement efficiencies in operating costs. Where good practice is developed in one network or part of our business, we now have processes in place to ensure this practice is shared with the rest of the business.

Our Information Systems (IS) transition has progressed well, with the last remaining elements to be addressed as we approach the end of the separation from National Grid due 2019/20. In establishing our own systems and infrastructure, we have looked at the best way to design flexibility, such that IS enables productivity and improved experience for our customers. This includes transforming our back-office systems for Human Resources, Supply Chain and Finance to allow the business to more effectively and efficiently manage these activities.

The safety of our customers, our people, and our extended workforce, as well as those who live near our assets and are affected by our activities, is of paramount importance. We have a strong safety culture, but no safety incidents are acceptable. We are building a refreshed focus on process safety and reinforcing our visible and effective safety culture to drive future improvements in our long-term ambition.

We have engaged our people about delivering higher levels of satisfaction to our customers. As well as changes to our organisational structures and processes, we are working to develop our culture and behaviours to bring our transformation to life. We see this as an essential activity to ensure our people have the capability and confidence to make the right decisions for our customers.

During the year we delivered a significant step up in investment across our replacement and asset health activities. This work was completed through our Gas Distribution Strategic Partners, other contract organisations, and our own direct labour workforce. We need to continue to increase investment over the remaining two years of this price control period to deliver the replacement programme in full and this is a key focus area for us and our delivery partners.

Inspiring our people

We are proud of our talented and committed people who are equally proud and motivated to deliver for all our customers. We are focused on recruiting the right people, supporting them to understand their role and our values, and then enabling them to develop as we aspire to create a high-performance culture. Our people are essential to delivering our future vision and we are working to set the right balance of skills to ensure our operational performance can support our strategy.

We are committed to addressing our gender pay gap by consistently reviewing and addressing policies and practices. As we take positive steps forward, we appreciate it may take time to change as we work within our communities to inspire and attract a diverse range of talent.

We are constantly looking at how we can inspire, encourage and support our people. From the very earliest stages of education, through to our apprentice scheme and professional development programmes, we help our people to advance their careers, whatever their area of expertise.

Making a difference in our communities

The Board have committed to setting up a community fund to support communities and customers by investing 1.25% of our post-tax profits and this is being launched in the summer of 2019. This fund is a key part of how we can demonstrate a clear public purpose and our commitment to supporting the communities we serve.

Our focus continues to be on delivering positive change affecting people's lives today, while setting up our network for future generations. Safeguarding our customers and supporting them away from fuel poverty are priorities for our communities and we are delighted that our business is rising to these challenges. We have continued our collaborative approach and we have pioneered the industry in a number of areas and taken a lead on several cross-industry groups. We are proud of our safeguarding services and activities, including free locking cooker valves for those living with dementia, chairing the industry-wide Safeguarding Customers Working Group, promoting the Priority Services Register ('PSR') and our educational work to raise awareness of the dangers of carbon monoxide. We are working hard to make sure our people understand vulnerability, stay flexible, are ready to act and embed our understanding in our existing processes.

We are spearheading industry collaboration and establishing expert partnerships to make sure we tackle vulnerability effectively and our community fund investment will accelerate this work.

Shaping the UK's gas network

Climate change and energy policy have arguably never been higher up in the public consciousness and the political agenda. We have seen calls to declare a Climate Emergency and the ambitious emissions targets for the UK which were set by the Committee on Climate Change in their recent report 'Net Zero – the UK's contribution to stopping global warming' and whose recommendations the UK Government has recently announced will be enshrined in law. There is now an almost universal acknowledgement that material action over the next 10 years is non-negotiable if we are to have any chance of ensuring we meet the challenges of decarbonising our economy and we can afford no distractions or delays.

As a responsible company with a deep understanding and expertise of the key issues connected to gas decarbonisation we have been helping to inform and direct energy policy, particularly in the challenging areas of heat and transport. We are doing this by working with stakeholders across national and local government, industry and investors. Local communities and regional groups are increasingly playing their role in informing our plans, helping us to ensure that our current operations and our future business plans are reflective of the needs and potential of the communities in which we live and work.

As well as the significant challenges in defining the UK's future energy mix there are also significant opportunities for the UK to become a global leader in low carbon energy. The size of the challenge means that cooperation and collaboration is vitally important and we are working alongside partners in the other gas distribution networks and gas producers, together with the low carbon transport sector to find alternative sources of clean energy and develop a clear pathway to a future energy system based on low carbon sources such as hydrogen. The potential for a clean and green economy is within our grasp and we are determined to play a leading role in ensuring that in this next decade the full potential of the gas network is fully realised.

Our vision

As we look back on the last year we have faced significant challenges, these have been met with true dedication and commitment from our talented people, this gives us renewed optimism to put customers at the heart of everything we do.

We are working on a truly transformational strategy which is committed to building on our strengths and changing the way we work and the way we deliver services to our customers now and in the future.

This is about our people, and culture where we will be developing our people to build on existing skills and expertise but focusing on delivering the right outcomes for customers. With our vision and drive we will be leading the way in delivering value and quality of service. We will be creating a sustainable future, improving our environment and are dedicated to acting in a responsible and ethical way.

Our transformation plans will start to impact positively our performance during the remainder of this regulatory period, driving improvements into the RIIO-2 period and we are fully committed to realising our vision to set standards all of our customers love and others aspire to. This journey has now started. We are working towards delivering on our vision as we continue to keep the energy flowing to make sure our customers are safe, warm and happy.

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Chairman's Update

A solid performance in a challenging year.

Sir Adrian Montague CBE, Chairman

In a year that has brought significant organisational change as well as external challenges, we have continued to deliver a safe and reliable supply of gas to our customers, while maintaining our financial performance.

We firmly believe that gas will continue to be a core element of the UK's energy mix, and, working with partners, we are determined to be at the forefront of solutions.

Board focus and outlook

We have made progress towards becoming the company we aspire to be but recognise that there is more to be done. Although there have been improvements, delivering consistently high customer service across our four networks and enhancing efficiency remain our core focus areas as we approach the next regulatory review. Our customers should be at the heart of the decisions we make and through our continuous engagement with them we should understand their expectations and work hard to not only meet them but exceed them. It is with this in mind the Board has been supporting management in advancing a programme of organisational transformation to improve operational performance while managing costs. The primary thrust of the programme has been to clarify accountability and devolve decision making to our networks, and to increase the flexibility of the workforce in the context of a construction market facing cost pressures and constraints on the availability of skilled labour.

As well as changes to organisational structures, the programme has called for a shift in mindset, but the business has risen to the challenge as people recognise the opportunity.

As we look ahead to the next price control period, RIIO-2, starting in April 2021, several teams within Cadent are working actively to prepare our business plan. The Board has strived to ensure that the business is engaging closely with its customers and stakeholders to develop plans that meet their needs, with the independent Customer Engagement Group initiated by Ofgem providing a live challenge of our 2021 business plan.

Operating responsibly

Cadent is committed to operating in a safe, responsible and sustainable way, and the Board has a dedicated Safety & Sustainability Committee to oversee this aspect of the Group's operations. Supporting and challenging management to operate in a 'zero harm' manner, allow access to services for customers in vulnerable situations and emphasise the strategic importance of sustainability are all important parts of the committee's remit. During the year the business has been working closely with the Health and Safety Executive and Ofgem to improve our processes in relation to the particular challenges of high rise buildings. We have been working hard to meet this challenge and have responded to redress the issues.

The Board has been working to identify the best way for Cadent to demonstrate this wider corporate and social responsibility. The community fund we are establishing is ground breaking in its commitment to support the communities we serve.

The future role of gas

Cadent also continues to play a key role in helping to shape the future of the industry through its participation on industry working groups and its market leading innovation projects. Cadent's investment in thought leadership and cutting edge solutions signal our Company's recognition of the vital role of gas in decarbonising heat and transport, for example by bringing renewable gas and/or hydrogen into the network. We firmly believe that gas will continue to be a core element of the UK's energy mix, and, working with partners, we are determined to be at the forefront of decarbonisation solutions.

Corporate governance

The focus of the Board and its committees during the year is a reflection of the developments and challenges the business has faced. Preparation of the business case for the next set of regulatory price controls ('RIIO-2') has been, and remains, of particular importance, as we have reviewed the progress of the various workstreams. While there has been a great deal of work undertaken to date, there is much yet to be completed, and this will remain a key priority over the coming months.

Looking ahead

Looking ahead, the focus of the Board will be to oversee the completion of the ongoing transformation process and to ensure Cadent is well positioned as it submits its RIIO-2 business case to Ofgem later in the year.

The Board are pleased to have committed to setting up a community fund to continue our work with supporting communities and customers. This will be launched in the summer.

As a newly separate organisation, we have the opportunity to sharpen our focus to meet the needs of all of our stakeholders in an effective and efficient manner. As we complete our organisational transformation, our structure will allow us to deliver better outcomes we have committed to for our customers with renewed vigour, so we can continue to keep people safe and warm in their homes, as well as powering industry and fuelling transport, in a sustainable way.

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2. Output Summary

RIIO-1 created a platform that has allowed us to deliver continuous improvement across our services whilst reducing bills in real terms. Customers receive a safer, more reliable and more innovative network service including increasing volumes of green gas. Our customers in vulnerable situations are helped by free or low cost connections and new means to identify and record their circumstances.

Delivering to customers and stakeholders

The following section contains an update on some of our key achievements and areas of focus as well as a high level summary of our general output performance.

Key highlights

- We achieved above 98% for our 1-hour and 2-hour emergency responses in all of our networks, both of which are above the 97% performance level set by Ofgem with average attendance within 35 minutes.
- We exceeded the 90% performance level again in our connections standards of service in all networks.
- The actions we have taken this year have delivered customer satisfaction improvements in 10 of the 12 categories and in particular has led to significant improvement in the West Midlands Connections satisfaction rating which has risen by 6% from 7.85 in 17/18 to 8.35 this year. We recognise that there is still more to do and that we need to do better in these areas and our transformation plans are focussed on improving quality of service to customers.
- Moving our complaint process to the local operating teams has resulted in faster resolution of complaints of 66% from 17/18 and our average complaint metric is now down to 3.3 across all networks. This performance is much better than the 11.57 metric set in the RIIO-1 final proposals.
- We have delivered a total of 4,669 Fuel Poor Connections across our networks this year. The strategy that we implemented in our London Network continues to deliver improvements with a 50% increase in demand for Fuel Poor connections from 17/18.
- We continue to lead industry developments ranging from our work on identifying vulnerability, through to carbon monoxide awareness, national streetworks policies, facilitating competition in the gas market through our work on the Retail Energy Code and the future role of gas in achieving UK climate change targets.

Focus areas

We faced considerable challenges in the area of unplanned interruptions of gas supply in multi occupancy buildings (MOBs). As reported last year, we have exceeded our RIIO-1 unplanned durations target in our London network due to our MOBs performance. Based upon our performance and following engagement with Ofgem and the HSE over the past year, we have committed to a comprehensive customer improvement plan, with short, medium and long term actions to reduce the number of unplanned MOBs interruptions and where buildings are disconnected, to restore supply more quickly as well as provide more support to the affected customers. This work is already showing signs of improvement and we will maintain our focus in this area for the remainder of RIIO-1 and beyond as a key feature of our RIIO-2 business plan commitments.

We are disappointed that we are still not meeting our customer service expectations in our West Midlands network in relation to planned work. Our commitment and focus to improve customer experience in all areas remains and we must now ensure that our improvement plans and associated actions deliver results. These plans are centred around improved on-site communications and reinstatement, both in terms of timeliness, quality and overall site tidiness.

With regards to connections our service transformation programme is well underway and we are expecting further improvements across all networks during 2019/20. Given the previous challenges in meeting customer expectations within our North London network, this area has been prioritised to ensure benefits from greater customer focus and relationship management principles will be delivered here first and early signs of improvement are already being seen.

In relation to mains replacement we have met the primary output relating to risk removed, however we are behind the linear RIIO-1 target of 'length of mains off risk'. The plans we put in place for East of England and London have driven significant performance improvements and their trajectory remains positive. In the case of North West and West Midlands we have implemented revised contractual agreements and we remain committed to meeting the 8-year target.

The table below provides an overview of our performance against output targets for 2018/19

Performance Snapshot 2018/19

Output	Metric		East of England	London	North West	West Midlands
Number of customers directly connected to network	No.	Comparator	4,019,395	2,274,533	2,690,935	1,963,755
Total GDN network length all pressure tiers	km	Comparator	51,843	20,969	34,200	24,220
Network reliability						
Overall network reliability	% of full delivery 24/7/365	Comparator	99.998%	99.988%	99.998%	99.998%
Maintaining Operational performance		8 year	√	√	√	√
Unplanned customer interruptions – exc. major incidents	No. of customers affected	Comparator	11,947	10,716	10,126	6,138
	% per number of total customers	Comparator	0.3%	0.5%	0.4%	0.3%
	Average duration in minutes	Comparator	878	11,111	1,120	843
Interruptions - unplanned (vol)		8 year	√	√	√	√
Interruptions - unplanned (duration)		8 year	√		√	√
Interruptions - planned (vol)		8 year	√	√	√	√
Interruptions - planned (duration)		8 year	√	√	√	√
Number of major incidents	Number : Customers affected	Comparator	4:4438	0 : 0	0 : 0	0 : 0
Customer satisfaction						
Customer satisfaction – Emergency response & repair	score out of 10	Ofgem target (8.01)	9.45	9.12	9.35	9.39
Customer satisfaction – Planned works	score out of 10	Ofgem target (8.04)	8.62	8.22	8.26	7.75
Customer satisfaction – Connections	score out of 10	Ofgem target (8.09)	8.22	7.50	8.69	8.35
Complaints metric	scoring of complaints resolution	Ofgem target (below 11.57)	2.80	3.50	3.20	4.23
Stakeholder Engagement			6.3			

Connections						
% of all quotes issued within timescales set	%	Ofgem target	98.39%	98.30%	97.96%	98.40%
% of jobs substantially completed on date agreed with the customer	%	Ofgem target	94.01%	91.72%	96.48%	94.53%
Introduce distributed gas entry standards - cummulative 18/19		8 year	√	√	√	√
Social obligations						
Fuel poor connections made in year	No.	Ofgem target	1,951	790	1,289	639
% of fuel poor connections RIIO to date vs period to date target	% better than target	Comparator	12%	14%	-2%	-5%
Carbon Monoxide awareness		Annual	√	√	√	√
Safety						
Attend uncontrolled escape in 1 hr	% achieved	Ofgem target is 97%	98.5%	98.0%	98.9%	98.9%
Attend controlled escape in 2 hrs	% achieved	Ofgem target is 97%	99.3%	98.8%	99.7%	99.4%
Annual repair risk performance vs target	% better than target	Ofgem target	92.0%	95.8%	96.9%	91.7%
Call Centre response	% better than target	Ofgem target	94.41%			
Iron mains risk removed	% better than target	Ofgem target	√	√	√	√
Major accident prevention		Compliance	√	√	√	√
Sub deducts		Ofgem target	√	√	√	√
Environmental impact						
Reduction in shrinkage in year (gas emissions)	Volume (GWh)	Comparator	-18	-13	-15	-9
Shrinkage actuals compared to target volume	Improved shrinkage %	Ofgem target	9%	8%	9%	8%
Renewable gas connections	Number : Volume (scmh)	Comparator	3:3050	0 : 0	0 : 0	0 : 0
Provide biomethane connections info.		Annual	√	√	√	√
Financials						
Totex operating costs	£m	Ofgem target	340	301	224	169
% lower Totex than allowance	%	Comparator	5%	3%	15%	18%
Other pass through costs	£m	Comparator	112	84	100	71

In addition to our output commitments during 2018/19 we have delivered the following:

- We conveyed 257 TWh of gas to 11 million homes and businesses in our four networks, this is equivalent to 86% of the total UK annual electricity system demand (which is around 300TWhs).

- We have delivered improvements to the Priority Services Register so that we continue to keep our customers safe, warm and independent in their homes. The increased clarity of data on the register will help us to develop new services and drive actions targeted to customers' needs across our networks. To help deliver this we are reviewing our partner strategy so that we take a more strategic approach towards key areas of need.

- We continue to lead on behalf of all energy networks on the Street Manager project being commissioned by the Department for Transport (DfT) to transform the co-ordination, collaboration, management and communication of street and road works. Cadent was nominated to represent Streetworks UK and this appointment reflects the importance, experience and expertise that we were able to bring to this critical project and demonstrated the trust we have gained with our key stakeholders. In recognition of this and for many years of representing utilities and developing national streetworks legislation our Streetworks Manager received an award for outstanding contribution.

In one of our biggest and most high-profile mains upgrade projects of 2018/19, we spent three months replacing mains outside Shakespeare's birthplace in Stratford-upon-Avon. This is one of the UK's centrepiece tourist attractions, which welcomes three million visitors every year. Our stakeholder engagement approach was judged as 'excellent and creative', winning a communications leadership award at Street Works UK 2018 awards.

- We have continued to support the supplier-led programme to install smart meters in every home by 2020. We have worked collaboratively with BEIS and gas suppliers on the smart metering roll out and this has been supported by their feedback where suppliers acknowledge that we are market leaders in terms of industry collaboration on the smart programme. In addition we have remained open and interactive with the wider industry and adapted reporting practices to resolve issues faced by the industry whilst still supporting the roll-out programme for the benefit of our customers.

- Cadent has led engagement with external lawyers on behalf of all networks to deliver the Legal Text for the 'consequential' changes to the Uniform Network Code (UNC) required as part of the introduction of the Retail Energy Code (REC). We have kept that the UNC Modification Panel and associated UNC parties fully informed of progress and as a result of our contribution a full suite of legal text alongside an explanatory note has been delivered to Ofgem on time and included within the Ofgem Switching Programme Consultation.

- We have been utilising social media more in the latest incidents in the East of England and have found this to be an excellent way to communicate with affected residents. It has assisted us to reach out to the community, not only from our own Cadent page but by linking in to local pages coordinated by residents. We can reach people when they are away from their homes and it has assisted us with speeding up the process of isolating and restoring the gas supplies at properties. We work hard to keep in touch and support those who may not have access to online services.

We are particularly pleased with our collaboration with other gas transporters and stakeholders, on pathways for the future role of gas. We continue to develop our compelling case for repurposing the UK's gas network so that it can deliver green gases such as hydrogen for use in domestic heat and cooking and reduce domestic CO2 emissions and we welcome the government's recent announcement 'Net Zero – the UK's contribution to stopping global warming'. We are also strongly encouraging ministers and industry to tap into the potential for the existing UK gas network to deliver hydrogen for transport and industry, both of which are major contributors to emissions. Openness to innovative collaboration and partnership is attracting many new and influential supporters who can see the wider benefits of developing a hydrogen economy.

In April 2019 our HyDeploy Update event achieved national coverage and was attended by several high level stakeholders including ministers and trade union representatives.

- Our pioneering HyDeploy project – providing evidence on the level of hydrogen which can be used safely in the gas network and without disruption to customers – is now in its second year and progressing well. In September 2019 we will start delivering a blend of natural gas and 20% Hydrogen to 100 homes at Keele University and 30 faculty buildings. This will be the first working demonstration of domestic hydrogen in the UK and an excellent example of partnership as we have worked with Northern Gas Networks, Progressive Energy and the HSE among others. Hydrogen's widespread use blended with natural gas has the potential to reduce carbon emissions by as much as 6m tonnes a year.

- With funding from the Network Innovation Allowance we have continued to develop and share the concept we call HyNet North West. This provides a practical and economic framework to introduce hydrogen into the gas network in the Liverpool-Manchester area using our North West network. HyNet has gained real support this year – among local and regional authorities as well as regional industry. It is clear now that HyNet can provide the foundation upon which a hydrogen industry for the UK could be built, serving industry, heavy transport and including hydrogen production with carbon capture.

- Our work on decarbonising transport continues and one strand – HyMotion – published its report in June 2019. This set out the pathways that will be necessary to achieve low carbon hydrogen fuel provision for HGVs, trains, cars and other modes of transport. Another project, in partnership with the National Physics Laboratory, is looking at delivering hydrogen to a sufficient level of purity to enable fuel cell production. This has gained a great deal of interest from industry and we are keen to share our findings.

- Our political engagement continues to demonstrate the vital role that gas networks play now and in delivering the low carbon energy system of the future. We are members of the new Greater Manchester Combined Authority Strategic Infrastructure Board which again allows us to help drive the energy and infrastructure agenda within this key metropolitan area and builds our existing membership of the equivalent board for the Mayor of London.

- We are actively engaged with the energy and infrastructure teams for both the West Midlands Combined Authority and the Liverpool City Region.

- At Westminster we have regularly engaged with the All Party Parliamentary Group on Hydrogen as well as the Minister for Energy and shadow ministers.

Cadent has completely rethought its approach to collaboration and is now just as likely to be involved with regional economic debates as contributing to energy sector issues because we realise how much benefit can be gained from a more connected approach to issues such as climate change.

3. Totex drivers

Cost efficiency benefits for our customers

Our Totex outturn in the year was ahead of forecast driven by continued delivery of Opex cost efficiencies coupled with lower than expected investment spend (largely from Repex volumes being re-phased into later years), whilst continuing to deliver a safe and reliable network. Overall, our Totex forecast to deliver the eight-year output commitments, is £8,438m for the RIIO-1 period; and represents Totex costs which are c.£620m (6.8%) lower than the Totex allowances. East of England's lower performance is driven by its lower proportion of Repex spend within the Totex allowance.

OVERALL TOTEX PERFORMANCE*	CURRENT YEAR		RIIO GD-1 TO DATE		8 YEAR FORECAST	
NETWORK	VARIANCE TO ALLOWANCE £m	% VARIANCE	VARIANCE TO ALLOWANCE £m	% VARIANCE	VARIANCE TO ALLOWANCE £m	% VARIANCE
EAST OF ENGLAND	16	5%	153	7%	92	3%
LONDON	11	3%	285	15%	201	8%
NORTH WEST	40	15%	151	9%	131	6%
WEST MIDLANDS	37	18%	175	14%	197	12%

* Performance measured against allowances as represented per Ofgem Table 2.2 (i.e. exclusive of Totex adjustments such as for IAS19 Pension costs etc.)

This efficiency against allowances is lower than we reported last year (£660m in 18/19 prices), and is driven by an increase in Totex forecast, offset in part by a net increase in allowances. Details are provided below:

Our forecast of Repex spend for the remainder of RIIO-1 to deliver the mains decommissioned length output has increased by £38m (1.1%) since last year mainly reflecting further market driven unit cost increases driven by the scarcity/competition in securing the qualified resources, which we have seen this year. In addition to market pressures we now also envisage higher than anticipated workload in respect of non-rechargeable diversions (e.g. River Ouse) which accounts for £8m of the increase.

Our forecast of Capex spend has increased by £50m (4.0%) since last year and is largely driven by two factors.

- Firstly, our transformation strategy which will invest an additional £33m (£26m in IS and further increases in property and vehicles). As we move towards a more network aligned, multi-skilled and efficient operating model this will drive long term enduring efficiencies which will benefit consumers well into the future and can be seen in our corresponding reduction in Opex cost forecasts.

- The second major factor is a c.£20m increase in customer driven Connections as we are continuing to see a trend of demand growth of c.2% per annum.

Offsetting the above investment forecast increases, our Opex forecast has reduced by a further £31m (-0.8%) since last year's forecast. Indeed, the forecast for 2020/21, the last year of RIIO-1, has been reduced further this year and we now seek to deliver an ambitious 17% improvement in Opex in our first four years of operating as a standalone business, driving value for our customers through into RIIO-2. We have continued to challenge all aspects of our business to identify and commit to deliver transformational and on-going business improvement efficiencies in real terms and to offset some of the emerging upward Opex cost pressures we face (namely, additional asset health expenditure in relation to non-routine maintenance activities, depth of cover remediation and workload in respect of Multiple Occupancy Buildings).

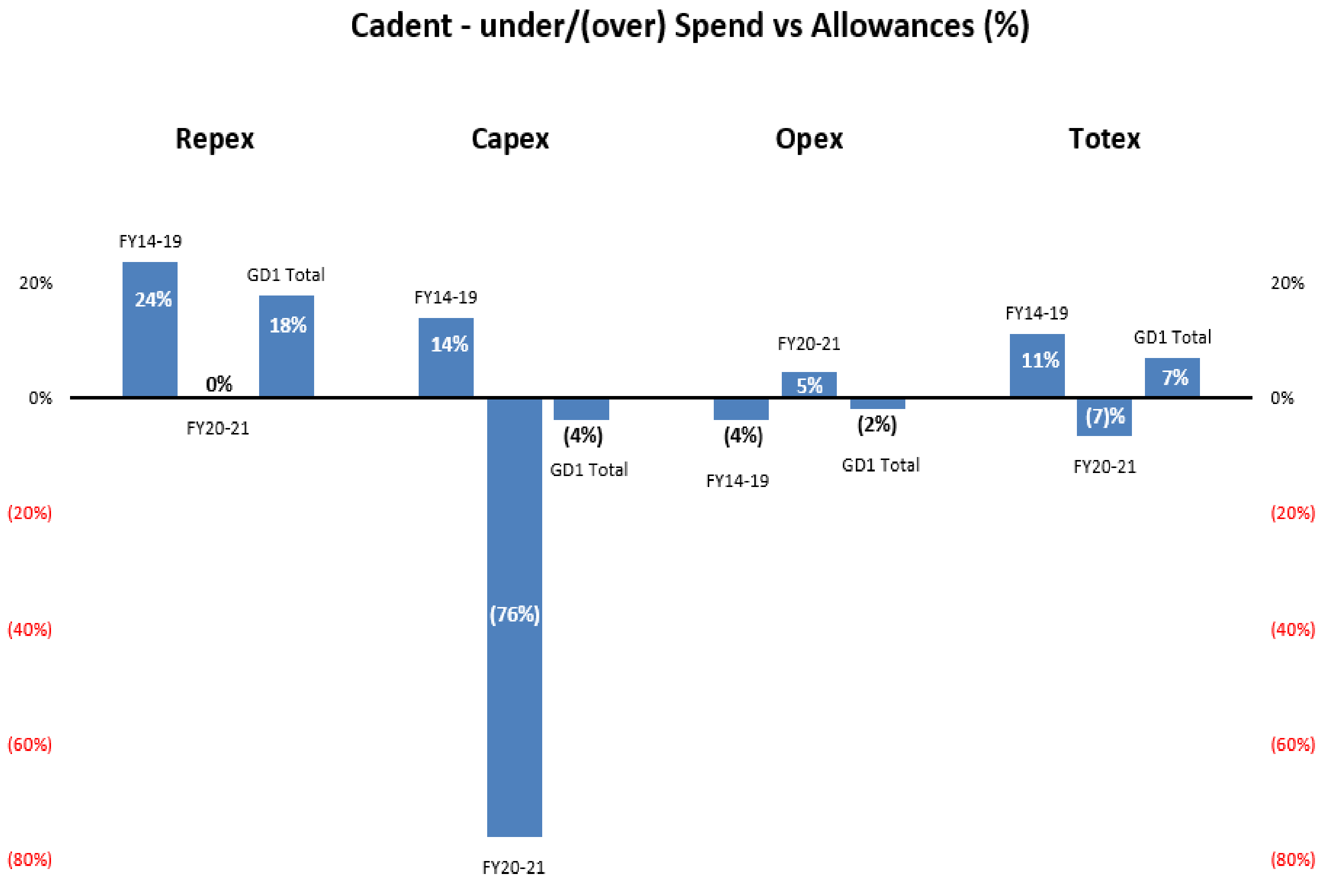
Since last year we have been awarded, via the November 2018 Annual Iteration Process, an additional £23m of allowances (18/19 prices) following the re-opener submission for Streetworks in the East of England. This has partially offset by a £8m reduction (18/19 prices) in Tier-2A Risk Above Threshold allowances (across all 4 networks) based on our actual spend in FY 2018.

The following table outlines our expected sources of Totex 8-year efficiencies:

		8 Year Efficiencies* (£m, 18/19 prices)			
		Repex	**Capex**	**Opex**	**Totex**
Innovative long term conntracting approach	- More risky contract approach to optimise and crystalise keener prices from 8 year contracts with set work with aligned incentives to customers - Economies of scale (merging 6 contracts to 2, and consolidating locations) - Moving Design into GDSPs (instead of duplication/handoffs in old model) - Single delivery unit for planned work (stranding of resources in opex)	180	0	-85	**95**
Improved design and use of best practice	- Cost efficiencies from improved detailed design - Increased use of best practice / existing techniques improving abandon/lay ratio, level of insertion and live insertion	240	0	5	**245**
Optimal Pipe selection	- GDSPs optimising a fully risk based selection criteria to deliver Primary Output - Partially offset by more services	195	0	0	**195**
Within Period Innovation	- GDSPs continuous improvement plans to deliver - New Technology roll-out - Rephasing of workload into last four years to drive more efficient delivery - Direct Opex process improvements, driving end-to-end efficiencies from our new performance excellence initiative	125	5	140	**270**
Optimal network planning	- Driving nominated load requirements for interruption customers down (c.20%) - Improved network analysis - Underlying capacity demand reducing faster than business plan - slower economy / greater energy efficiency	0	25	0	**25**
Smart	- Rollout of Smart metering. Impacts reduced following working with industry, but still expect significant impact.	0	0	-30	**-30**
Business Support Costs	- At start of RIIO found to be off pace on this element of Totex. - Gap to allowance historically - in part due to centralised nature of NG structure plus centralised model benefiting lower operational costs - As a new separate business we are tailoring our business support costs and driving through improvements (including IS) that are reducing costs to below allowances by 2020/21	0	-80	-100	**-180**
	8 Year Totex Efficiencies*	**740**	**-50**	**-70**	**620**
		18%	-4%	-2%	**7%**

** Efficiencies are quoted against the regulatory allowances as stated in RRP Table 2.2*

The chart below shows how we have performed against our allowances during the first 6 years of RIIO-1 and how we expect to perform in the remaining 2 years.



For Repex, the 24% efficiency delivered to date is driven by a combination of work phasing, our innovative long term contracting approach and our strategy to optimise selection of pipe based on risk removed. The lower efficiency forecast for future years is reflective of the upward unit cost pressures as described above and a catch-up in the phasing of workload but is further compounded by the complexity of the remaining larger diameter mains replacement workload yet to be delivered in the programme. Despite these higher cost forecasts for the future we will still strive to deliver efficiencies against our allowances in the remaining RIIO-1 period and hence still continue to deliver on-going benefits for our customers.

For Capex, the 76% overspend against allowances in the 2 remaining years of RIIO-1 reflects the back-end phasing of the workload associated with delivering the Asset Health Network Output Measures (NOMs) which form part of the Risk Monetisation targets (the methodology for which has only recently been developed in conjunction with Ofgem). By the end of RIIO-1 we plan to deliver the NOM targets in each of our four networks, and in doing so, will have spent marginally above our allowances. This is mainly a consequence of the higher unit cost pressures that are materialising in the wider market, which are also impacting our performance against allowances in respect of customer Connections, as the majority of these are delivered by our Gas Distribution Strategic Partners (Balfour Beatty and tRIIO).

For Opex, at the start of RIIO-1 we were set an efficiency challenge to close the performance gap to that of an efficient network. We have delivered significant efficiencies since becoming a standalone company as evidenced in our FY18 and FY19 outturn results. Furthermore, we are committed to deliver on-going efficiencies in the future via further business transformation initiatives and a continued focus on a culture of continuous improvement and challenge over our processes – this is expected to deliver a forecast spend over the next 2 years which is (for the first time) lower than our Opex allowances, the efficiency target. This downward trajectory in Opex spend in the remaining RIIO-1 period not only positions us better relative to the other GDNs, but also means we can transition well into the challenges of RIIO-2 and allow us to continue to drive benefits for our customers well into the future.

4. Performance Summary

In this section of the report, we summarise performance against RIIO-1 measures of success, categorised by the four building blocks of the RIIO framework: Outputs, Incentives, Innovation and Revenue.

Outputs

The following section highlights our performance on the key outputs shown in the Output Summary table in Section 2.

1. Safety

Responding to gas emergencies

- **Measure: 90% of calls answered in 30 seconds**

We operate the National Gas Emergency Service contact centre, taking calls and giving safety advice on behalf of all gas networks. In 2018/19 we answered 1.798 million calls of which 94.46% were answered within 30 seconds.

Emergency response

- **Measure: Controlled gas escapes – attendance in 2 hours**
- **Measure: Uncontrolled gas escapes – attendance in 1 hour**

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

During the year we achieved above 98% for our 1-hour and 2-hour emergency response times in all of our networks (which exceeds the 97% performance level set by Ofgem), and we attended 352,473 reported gas escapes. The majority of this work relates to emergencies involving customer appliances, internal pipes and meters and these are not Cadent's assets.

The management of our emergency response and repair process has focussed on keeping the public safe in a complex environment where there are many competing priorities. During the period, management has sought to balance the following priorities, with focus given to ensuring safety:

- Attending escapes as soon as possible and making safe as required
- Resolving network escapes within 12 hours
- Ensuring that outstanding network escapes were managed in such a way as to ensure they did not expose the public to risk.

2018/19 data has shown a reduction of 16% in public reported gas escapes compared with 2017/18 this may be due to a number of contributing factors including the iron mains replacement programme and the effect that the weather has on ground conditions. Met office figures show that the 2018/19 winter temperatures were warmer than average with a cold spike only occurring in January.

Our emergency response vehicles are all equipped with GPS systems that enable us to confirm accurate arrival times for the 1-hour and 2-hour emergency standards. To our knowledge we are the only Gas Distribution Network to have this level of assurance for these emergency standards of service.

The tables below show our emergency performance across the RIIO period

	Uncontrolled – 1hr response time			
Network	**2015/16**	**2016/17**	**2017/18**	**2018/19**
East of England (EofE)	97.9%	97.9%	97.1%	98.5%
London (Lon)	98.0%	98.0%	97.4%	98.0%
North West (NW)	98.5%	98.5%	98.0%	98.9%
West Midlands (WM)	98.6%	98.5%	97.3%	98.9%

	Controlled – 2hr response time			
Network	**2015/16**	**2016/17**	**2017/18**	**2018/19**
East of England (EofE)	98.8%	98.6%	97.7%	99.3%
London (Lon)	98.6%	98.6%	97.8%	98.8%
North West (NW)	99.1%	99.0%	98.9%	99.7%
West Midlands (WM)	99.1%	99.1%	98.2%	99.4%

Repairing network escapes

- **Measure: Proportion of Gas Escapes Prevented Within 12 Hours**

In 2018/19 we attended 83,201 emergencies directly related to our network which continues the downward trend from 17/18 and represents 23% of all emergencies (the remainder being largely within customers premises). We have continued to meet our targets in all four of our networks.

The comparisons in the table below show that our performance in the proportion of gas escapes prevented within 12 hours is ahead of the Final Proposals set at the start of the RIIO-1 period.

Network	2015/16	2016/17	2017/18	2018/19	RIIO-1 Final Proposals
East of England (EofE)	52%	47%	49%	50%	42%
London (Lon)	52%	46%	45%	46%	43%
North West (NW)	51%	50%	50%	49%	34%
West Midlands (WM)	51%	49%	48%	49%	36%
Cadent (Average)	52%	48%	48%	49%	42%

Repair risk

We have continued to deliver our Network Repair Risk commitments in all of our networks as outlined in the table below with all networks below their cumulative risk scores set at the start of the RIIO-1 period. We are planning to engage with Ofgem on this output measure, as in our view the current output could be optimised further, as it currently represents (in our view) a poor value for customers as costs to achieve the target are well in excess of the perceived safety benefits to customers and the general public and significantly out of step with other GDNs.

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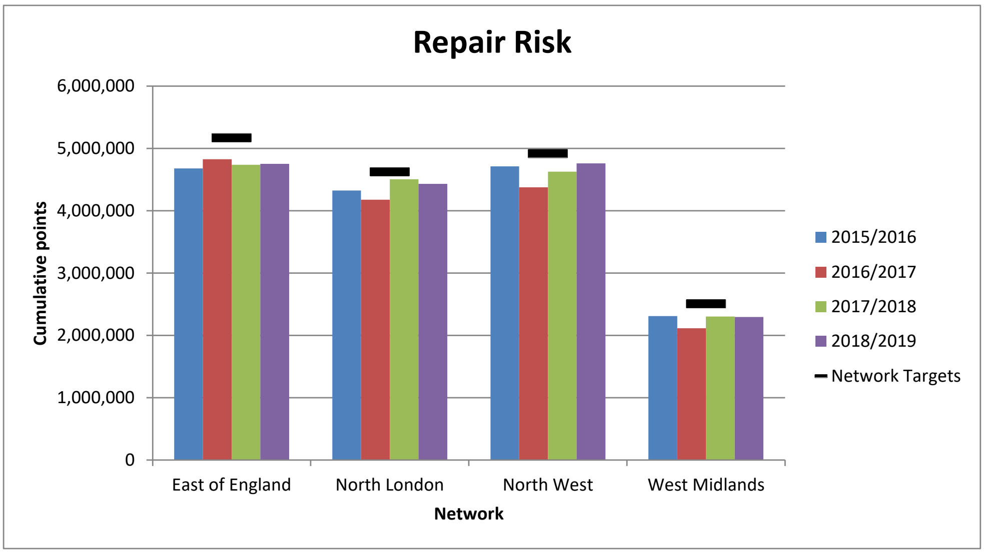
Network	Network repair risk (millions) 2015/16	Network repair risk (millions) 2016/17	Network repair risk (millions) 2017/18	Network repair risk (millions) 2018/19	Target
EofE	4.68	4.82	4.74	4.75	5.17
Lon	4.32	4.17	4.50	4.43	4.62
NW	4.71	4.37	4.63	4.76	4.91
WM	2.31	2.11	2.30	2.29	2.50



Major accident prevention

Our current Gas Safety (Management) Regulations Safety Case is approved by the HSE as required by our Licence. There were no process safety related incidents that resulted in injuries or significant property damage during 2018/19.

Sub-deducts networks off-risk

Sub deduct networks are linked to historical asset arrangements that are no longer installed. Sub deduct networks are those that are located on a network downstream of the gas transporter. The work in this area is focussed on determining ownership of the pipework that runs beyond the primary emergency control valve and if necessary either engineer out, refurbish or replace the sub-deduct network in those instances where the premises owner does not wish to retain liability for the asset.

At the start of the RIIO-1 period Xoserve provided a list of 955 sites that were required to be taken off risk and to date 806 (84%) sites have been successfully removed. Over the course of the period 70 new sites have been identified (primarily via Xoserve data cleanse/extract processes) with 46 of these identified in 2018/19.

During 18/19 through a range of interventions (e.g. engineering revisions to the network, site adoption and survey outcomes) we have successfully taken 28 sites off-risk and 81% of the total workload has now been completed (including the 70 new sites). We are now managing more complex Sub Deduct Arrangements (SDA's) and have delivery plans in place to meet the completion target by the end of RIIO-1 period.

The table below outlines progress to date in relation to the original 955 sites.

Network	Starting Position	Removed	% Complete	Outstanding
East of England	159	136	86%	23
North London	212	185	87%	27
North West	142	116	82%	26
West Midlands	442	369	83%	73
Cadent Total	955	806	84%	149

The table below shows the workload volumes since the start of the period (including the additional sites) and the current remaining workload.

	Revised Population	Completed Workload 2013/14	Completed Workload 2014/15	Completed Workload 2015/16	Completed Workload 2016/17	Completed workload 2017/18	Completed workload 2018/19	O/S Workload
	(FF)	(AA)	(BB)	(CC)	(DD)	(EE)		
EE	179	70	48	7	5	10	4	35
LO	233	121	43	14	6	2	0	47
NW	154	63	15	19	7	6	9	35
WM	457	183	54	38	35	46	15	86
TOT	1023	437	160	78	53	64	28	203

Please note that we have taken the opportunity to post-code match each site of the sites in North London and East of England against the asset network boundaries. This has resulted in a minor adjustment for these two networks and further details are provided in Appendix 5.

Iron mains risk reduction

The Iron Mains Risk Reduction Programme addresses the failure of 'at risk' iron mains within 30 metres of a building and the consequent risk of injuries, fatalities and damage to buildings.

Under the RIIO Framework there are two key outputs that measure the delivery of the Iron Mains Risk Reduction Programme. The primary output is 'risk removed' and the secondary is 'length of main off risk'. Against the primary output, Cadent continues to outperform the eight year linear target. The East of England and North West networks have already delivered the 8 year target and the London and West Midlands networks remain ahead of the linear targets.

The table below highlights our progress towards the 8 year target for each network:

Network	Risk reduction 8 year commitment	Proportionate annual risk reduction for one year	6 Year target risk reduction	Actual risk reduction achieved		Risk removal outperformance		% of the 8 year commitment removed to date
				2018	6-year total	2018	6-year total	
EofE	192,567	24,071	144,425	27,308	193,940	13%	34%	101%
Lon	102,281	12,785	76,711	12,929	78,746	1%	3%	77%
NW	154,428	19,304	115,821	17,743	156,241	-8%	35%	101%
WM	131,394	16,424	98,546	13,418	110,090	-18%	12%	84%
Cadent	**580,670**	**72,584**	**435,503**	**71,398**	**539,017**	**-2%**	**24%**	**93%**

Length of main off risk

In 2018/19, Cadent replaced 1,752km of mains (including diversions), an increase of 68km from 2017/18. This was primarily due to increased delivery in our East of England and London networks, driven through greater investment in the supply chain by funding and providing additional training to grow the resource base. Challenges in the North West and West Midlands networks has resulted in a decrease in 'length of mains off risk' in these networks compared to 2017/18. Ongoing difficulties in securing adequate resources, due to growth in infrastructure and construction markets has led to resource constraints, skill shortages and market/cost pressures. This growth in infrastructure and construction market is evident through the increases in major capital programmes and customer driven diversionary works.

We are pleased that the plans we introduced in 2017/18 for our East of England and London networks have improved performance. As shown in the table below delivery in the East of England network has increased by 104km from 2017/18 across all pipe sizes and in London, the delivery of Tier 1 (small pipes) is broadly in line with 2017/18 performance but we have replaced more of the larger diameter pipes and we expect the improvement in both networks to continue in 2019/20.

The table below shows the 2017/18 and 2018/19 decommissioning performance (including diversions).]

	2017/18					2018/19				
Actuals	EoE	Lon	NW	WM	Cadent Total	EoE	Lon	NW	WM	Cadent Total
T1 Iron	502	317	355	283	1457	595	319	334	262	1510
T1 Steel & Asbestos	22	16	49	20	106	25	18	33	23	98
Total Tier 1	**524**	**333**	**404**	**303**	**1563**	**620**	**336**	**367**	**285**	**1608**
T2 & 3 Iron	20	21	20	16	76	27	30	22	17	96
T2 & 3 Steel & Asbestos	7	1	1	1	11	7	5	1	4	17
Total Tier 2 & 3	**27**	**21**	**21**	**17**	**87**	**34**	**36**	**23**	**21**	**114**
Total Tier 1, 2 & 3	**551**	**354**	**425**	**320**	**1650**	**655**	**372**	**390**	**306**	**1722**
Other	10	6	13	4	33	10	6	10	5	30
Total T1,2,3 & other	**560**	**360**	**437**	**324**	**1682**	**664**	**377**	**400**	**311**	**1752**

Unfortunately, we have been unable to achieve the improvement in performance we expected in the North West and West Midlands networks. We are continuing to work collaboratively with our strategic partners Balfour Beatty to improve ongoing delivery. In addition, we have introduced a new delivery model, creating a new partnership in the North West (Construction Services North West) to deliver 150km of mains replacement work in the North West for the remaining RIIO-1 period. The region in which Construction Services North West will be operating is Macclesfield, Crewe, Nantwich, Northwich, Sandbach, Winsford, Whitchurch and Malpas. The new delivery model will be operated by Cadent, through a Construction Management Organisation and Local Delivery Partners.

Overall expenditure has increased from 2017/18; driven by increased unit costs through resource and market pressures and changes in work mix and location particularly in the East of England and London networks. In the North West expenditure is lower due to lower mains replacement workload, although unit costs have increased compared to 2017/18 as a result of the aforementioned resource and market pressures. Diversions gross cost increases can be largely attributed to specific major projects such as the A14 diversion in the East of England and Thames Tideway diversion in London.

CISBOT

In 2018/19, Cadent delivered some mains refurbishment using CISBOT (Cast Iron Sealing Robot), which is an innovative technique used for joint refurbishment. It has been successfully used in Central London in locations where there is a high degree of congestion and it is difficult to get approval to undertake road works. The technique allows us to extend the life of the asset by 20 years whilst minimising disruption to the public (further details of the technique are outlined under our Innovation section on page 42).

In 2018/19 we have delivered 3.8km of mains refurbishment in our London network using CISBOT and the table below provides details of the lengths delivered by diameter, number of joints and costs associated with this work type.

	2018/19		
	>355-500mm	>500-6300mm	Total
CISBOT Length (m)	2500	1310	3810
CISBOT Joints	728	406	1134
CISBOT Features	756	338	1094
Cost	£1,885,427	872,200	£2,757,627
Cost per metre	£754	£666	£724
Cost per joint	£2,590	£2,148	£2432

Please note: In line with Ofgem's request the mains refurbishment associated with CISBOT has been reported in Table 5.2c (Repex other mains), and for consistency we have also aligned the decommissioning of these pipes to Table 5.8 (Decommissioned summary).

Services Workload

Overall service replacement is directly proportionate to Tier 1 length delivery, however this is also impacted by work mix. Compared to 2017/18, the East of England has increased Tier 1 length delivery and has had the corresponding increase in service volumes, whereas in the West Midlands there have been decreases in both Tier 1 mains replaced and services relaid / transferred. The work mix in the London and North West networks has meant the volumes have not directly followed the volumes of Tier 1 main replaced, however cumulatively, we remain ahead of the Final Proposals which drives improved safety for customers.

The table below includes a count of all domestic and non-domestic services replaced including those re-laid after escape, as well as service pipes re-laid in association with mains replacement.

	2017/18					2018/19					Cumulative Performance				
Services Actuals	EoE	Lon	NW	WM	Total	EoE	Lon	NW	WM	Total	EoE	Lon	NW	WM	Total
MRP Relay	22,092	25,321	23,077	19,771	90,261	24,985	23,029	22,464	18,702	89,180	149,012	152,206	148,361	120,669	570,248
MRP Transfer	25,163	8,774	10,974	9,670	54,581	26,585	8,088	11,992	9,193	55,858	156,360	53,167	77,344	63,207	350,078
Total MRP Associated Services	47,255	34,095	34,051	29,441	144,842	51,570	31,117	34,456	27,895	145,038	305,372	205,373	225,705	183,876	920,326
Non-MRP Services (Metallic Replacement)	5,173	5,367	5,730	3,034	19,304	4,829	4,972	6,295	2,821	18,917	39,919	36,924	42,420	26,696	145,959
Total Services	52,428	39,462	39,781	32,475	164,146	56,399	36,089	40,751	30,716	163,955	345,291	242,297	268,125	210,572	1,066,285
Final Proposals	57,542	34,431	44,680	32,193	170,008	57,274	34,161	44,248	32,614	168,297	347,591	209,004	271,334	199,230	1,022,279
Variance to Final Proposals	-5,114	5,031	-4,899	282	-5,862	-875	1,928	-3,497	-1,898	-4,342	-2,300	33,293	-3,209	11,342	44,006
% Variance to Final Proposals	-9%	15%	-11%	1%	-3%	-2%	6%	-8%	-6%	-3%	-1%	16%	-1%	6%	4%

Gas in buildings

Compared to 2017/18 we have seen a decrease in 'network gas in buildings' in 3 out of our 4 networks. This is in line with the reduction of 'public reported escapes' and 'relay after escape' that we have seen in 2018/19.

Year	EofE	Lon	NW	WM
2013/14	1419	2454	1795	1116
2014/15	1,688	2,793	1,710	1,267
2015/16	1,778	3,140	1,854	1,264
2016/17	1,935	3,180	1,900	1,388
2017/18	1,744	3,005	1,727	1,347
2018/19	1,544	2,838	1,826	1,286

Fractures and corrosion

During 2018/19 we completed 3,191 fractures and corrosion repairs. We saw an increase in 3 out of 4 of our networks compared to 2017/18 and although we are seeing an increase in fractures and corrosions, we are seeing a decrease in the overall risk that iron pipes are presenting. This is reflected in our risk removed performance where it can be seen that our mains decommissioning is continuing to remove the risk of incidents from the iron mains population.

The table below shows the volume of fractures and corrosion since the start of RIIO-1.

F&C Trends	EofE	Lon	NW	WM
2013/2014	999	278	755	561
2014/2015	1,213	308	909	703
2015/2016	983	308	819	614
2016/2017	1,246	405	848	666
2017/2018	1,062	343	798	715
2018/2019	1,223	399	894	675

2. Reliability

Achieving 1 in 20 peak capacity standard

In 2018/19 we ensured that adequate capacity was available to meet a level of demand that is not likely to recur more often than once in twenty years.

Maintaining Operational Performance

This element of the Reliability output is based upon the following secondary deliverables: Number & value of offtake meter errors, Duration of telemetered faults, PSSR fault rate, Gas holder demolition and Capacity Utilisation:

- **Response to telemetered faults**
  During the period between 1st April 2018 to 31st March 2019 no meter errors have occurred in any of Cadent's networks and for a successive year all networks have been 100% free of errors in the energy throughput.

The results this year show a continued sustained performance in the resolution time of faults raised compared to the 2013 baseline following the implementation of the new process in late 2015/16. Performance is still far exceeding the original proposals and has continued to improve in all 4 Networks since last year.

- **PSSR faults**

The methodology for the assessment and reporting of PSSR faults is aligned to the requirements of the HSE for compliance with the Pressure Systems Safety Regulations. In 2016 Cadent adopted a more rigorous approach, better aligned to HSE expectations, for the classification of faults. This gave rise to more faults than forecast by the methodology applied to our initial RIIO-1 Plan. A range of measures have been implemented that are driving further improvements in performance across all networks and we remain fully compliant with the PSSR regulations.

North West are outperforming the forecast at the start of the RIIO-1 period and the focus in the network will be to sustain this for the remaining two years. Significant progress has been made in London and West Midlands compared to 17/18 and East of England has maintained a level of performance that is similar to last year's results. Action plans are in place across all networks for 19/20 to continue to improve performance, with the objective of achieving the original 20/21 plan in all networks, the actions we are taking include replacement of assets with components with higher failure rates; detailed analysis of faults to assess failure modes and subsequent improvement activities; additional guidance for engineers to ensure consistency in inspections.

- **Gas holder demolition**

We continue to make strong progress in the delivery of our RIIO-1 output commitment, removing an additional 10 gas holders in 2018/19 with a further 5 gas holders scheduled for demolition in 2019/20. This means that by the end of year 7, 97% of the output commitment will have been delivered with the remainder demolished by 2020/21 to meet our RIIO-1 output commitment.

The table below shows the progress we have made across the RIIO-1 period

GD1	Actual	Actual	Actual	Actual	Actual	Actual	Forecast	Forecast	Forecast
Actual / Forecast	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	Total
East of England	9	5	9	5	0	0	0	1	29
London	1	10	3	5	10	5	0	1	35
North West	0	5	9	6	4	5	5	0	34
West Midlands	0	0	4	0	0	0	0	0	4
Total	10	20	25	16	14	10	5	2	102

In 2018/19 we also removed 18 gas holders that had originally been planned for demolition in the RIIO-2 period. As shown in the table below we are forecasting to do more of these by the end of RIIO-1.

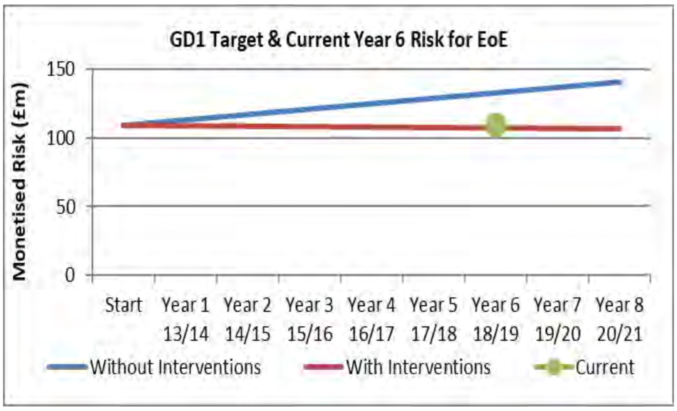
	Actual	Actual	Forecast	Forecast	Total
	2017/18	2018/19	2019/20	2020/21	Total
East of England	4	6	7	6	23
London	0	2	11	4	17
North West	0	7	0	5	12
West Midlands	0	3	2	3	8
Total	**4**	**18**	**20**	**18**	**60**

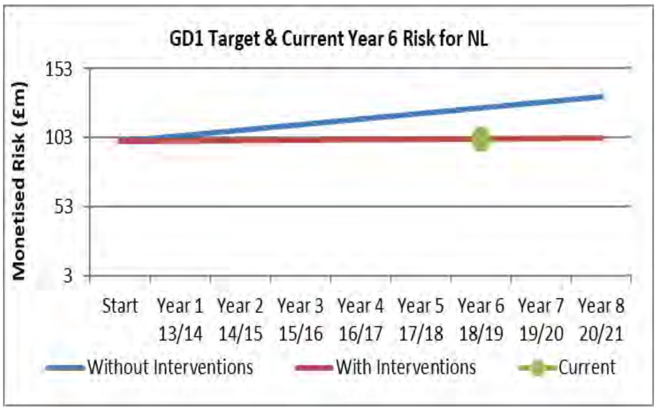
- **Capacity utilisation**
  A review of the capacity of each of our Offtakes and PRI's has shown there has been very little change in utilisation from the previous year. A small percentage of sites show flows slightly in excess of their design capacity under peak 1:20 demand conditions, however our networks are configured to ensure that these sites are supported by other installations so that the flows do not exceed booked capacity. These sites therefore do not pose a risk to supply reliability and will remain under review as peak day demand is reviewed on an ongoing basis. The data to support this Capacity Utilisation assessment is taken from the Pressure Reduction System Database which is kept current through reliance on updates driven by the design assurance "G17" process. Network models are validated on an annual cycle.

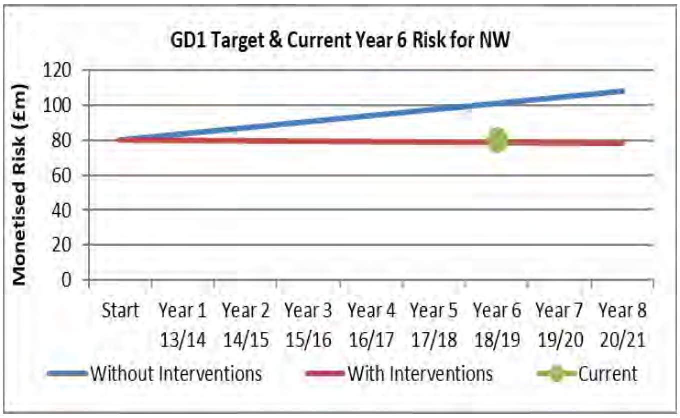
Health, criticality & risk metrics

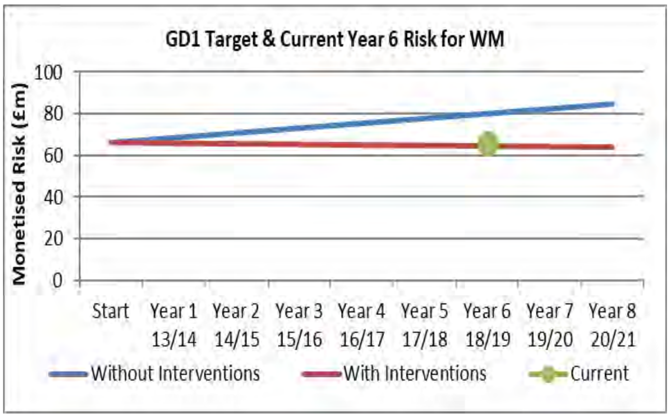
In last year's RRP submission Cadent submitted its 'rebased' business plan (BP) using the agreed monetised risk methodology to derive equivalent output targets. This year's submission provides an updated position for our current delivery position at year 6 only, with the 2013 and 2021 risk positions reflective of our rebased submission.

The charts below show risk deterioration evenly profiled over the GD1 period and the GD1 risk outturn position, the difference between these being the risk delta. The charts also show the risk position for each network at the end of year 6. By delivering our planned asset health investment over the remaining years of GD1, we forecast we will hit our monetised risk targets across each network. Only in year eight, when all investment has been delivered, will progress against risk delta be fully measurable.









Loss of supply – Network Reliability

Overall our network reliability was **99.996%** taking into account planned and unplanned interruptions.

Interruptions

In summary, for planned interruptions we are expecting average durations to continue improving with all four networks set to deliver below the 8 year target. We are however forecasting to surpass the initial number targets in 3 of the 4 networks, which is as a result of delivering more services as part of our mains replacement than we originally forecast, which delivers the added benefit of greater risk reduction for our customers.

In the case of unplanned interruptions we are forecasting to meet the 8 year number target in all four networks. As highlighted in last year's report and during our response to Ofgem's consultation on revised reliability (loss of supply) targets for RIIO-1, meeting the duration of interruption target remains a significant challenge with regards to MOBs. In our London network we have already exceeded our 8-year RIIO-1 unplanned durations target due to our MOBs performance, which has recently been addressed with Ofgem in conjunction with the actions we announced[1] in May 2019. Plans are being implemented across all of our networks to reduce durations and improve the performance for our customers.

The following section outlines our performance for both planned and unplanned interruptions numbers and durations. In the case of unplanned interruptions we have shown our overall performance against the targets revised by Ofgem in 2017/18 and also broken down by Multiple Occupancy Buildings (MOBS) and non-MOBS.

Loss of supply – number and duration of planned interruptions

In 2018/19 our interruption numbers have risen by around 3.5% overall and total interruption duration has increased by just over 2% since 2017/18, due to an increase in the amount of mains replacement work carried out during the year.

Although we have increased our replacement programme workload this has not had a detrimental effect upon durations as we have seen average interruption durations for Cadent networks improve by 8% since 2016/17

The table below shows the recent trend in our planned interruption numbers and durations

	Number of planned Interruptions			Duration of planned Interruptions (millions of minutes)		
	2016/17	2017/18	2018/19	2016/17	2017/18	2018/19
EOE	66502	66895	79302	22.63	21.66	23.41
NL	54996	51118	49989	21.56	18.65	18.53
NW	55620	52967	50985	17.04	15.56	14.31
WM	50812	43082	41622	19.13	14.35	15.56
Cadent	227930	214062	221898	80.35	70.22	71.81

Planned interruptions forecast

Currently we are forecasting to surpass the initial number targets in 3 of the 4 networks. This is as a result of delivering more services as part of our mains replacement than we originally forecast and we expect the increased service density to continue in our remaining mains replacement workload.

[1] https://cadentgas.com/news-media/news/may-2019/cadent-commits-to-renew-customer-trust

A continued focus on reducing average durations per interruption (for example through techniques such as live insertion), is reflected in our latest forecast. We are expecting the improvements in average duration to continue, this will enable all 4 networks to deliver below the initial duration targets. These targets and our forecast remains challenging but Cadent are committed to driving further improvements to outperform the targets and minimise disruption to customers. The following table indicates our forecast position for planned interruption durations.

The table below shows our forecast position for numbers and durations of planned interruptions.

Network	Numbers		Durations (millions of minutes)	
	Forecast Cumulative Total	Revised Cumulative 8 year Total	Forecast Cumulative Total	Revised Cumulative 8 year Total
East of England	608,037	585,934	208	213
North London	449,443	472,436	180	191
North West	498,767	476,237	162	170
West Midlands	385,296	377,826	145	153

Loss of supply – number and duration of unplanned interruptions

At a Cadent level, the performance is broadly consistent with the previous year, volumes are 1.5% lower, durations are 1.9% higher.

As highlighted in last year's report and during Ofgem's consultation on revised reliability (loss of supply targets for RIIO-1), the durations element of the output remains a significant challenge with regards to MOBs.

To illustrate our performance with respect to unplanned interruptions in the following tables we have outlined:

- total unplanned interruptions (including Multi Occupancy Buildings (MOBs) but excluding major incidents) for the period 2016/17 – 2018/19
- our performance against the 8 year cumulative target (including non MOBs & MOBs but excluding major incidents),
- performance in 2018/19 **excluding** MOBs and major incidents
- 2018/19 MOBs performance,

as well as the actions we are taking to drive improvements across our networks.

Total unplanned interruptions (including Multi Occupancy Buildings (MOBs) but excluding major incidents) for the period 2016/17 – 2018/19

Network	No. Unplanned interruptions			Duration Unplanned interruptions (million minutes)		
	2016/17	2017/18	2018/19	2016/17	2017/18	2018/19
EofE	11,174	11,763	11,947	10.2	12.4	10.5
Lon	10,498	10,421	10,716	63.4	116.6	119.1
NW	10,348	11,286	10,126	9.3	7.3	11.3
WM	6,388	6,089	6,138	4.7	8.4	5.2

Cumulative number & durations vs 8 year target - Unplanned Interruptions

Network	Numbers		Durations (millions of minutes)	
	Cumulative Total ytd	Revised Cumulative 8 year Total	Cumulative Total ytd	Revised Cumulative 8 year Total
East of England	76,504	99,608	71	108
North London	72,642	100,083	464	428
North West	68,509	91,566	54	63
West Midlands	44,163	60,506	40	47

Unplanned Interruptions (2018/19) – excluding MOBs and major incidents

Network	Total Number (Excl MOBs & major incidents)	Total Duration (million mins) (Excl. MOBs & major incidents)	Average Duration (Mins) (Excl. MOBs & incidents)
EofE	11,752	5.7	485 (8hrs)
Lon	8,775	7.2	817 (14hrs)
NW	9,838	6.2	628 (10hrs)
WM	6,016	3.2	537 (9hrs)

Unplanned Interruptions (2018/19) - MOBs

Network	Total Number	Total Duration (million mins)	Average Duration (Hrs)	Average Duration (Days)
EofE	195	4.8	409	17
Lon	1943	111.9	960	40
NW	288	5.2	353	15
WM	125	1.9	259	11

We faced considerable challenges in the area of unplanned interruptions of gas supply in multi occupancy buildings (MOBs). As reported last year, our London network has already exceeded our RIIO-1 unplanned durations target due to our MOBs performance. Following engagement with Ofgem and the HSE over the past year, we have committed to a customer experience improvement plan with short, medium and long term action plans to reduce the duration of unplanned MOBs to an average median of 10 days per building by 20/21. In addition these plans include increasing the number of repairs we can carry out without disconnecting. Where buildings are disconnected we will restore supply more quickly as well as provide more support to our customers and particularly those in vulnerable situations. This work is already showing signs of improvement and we will maintain our focus in this area for the remainder of RIIO-1 and beyond and is also a key feature of our RIIO-2 business plan commitments.

It should be noted that for North West, the rise in minutes in 2018/19 was largely attributable to an increased number of medium rise buildings which required increased design and pre-construction activities to facilitate effective outcomes for customers. Of the 78 schemes covering 288 customers, 19 of the schemes (96 customers) accounted for half of the 5.2m minutes.

We continue to focus on embedding new techniques and new processes into front line operational functions and applying lessons learnt in London across our other networks. Our Energy Exchange Programme (implemented during the course of 2018/19) is one such initiative that offers customers with low gas usage (typically cooking only loads) an opportunity to move to a more cost effective electricity solution and avoiding the inconvenience of disruptive gas riser replacement work. We have undertaken 11 this year in partnership with customers and local authorities and will develop further such initiatives going forward. As this programme effectively supersedes the interruption for those customers, volumes and durations are not included in our reporting.

Unplanned Interruptions – major incidents

In addition to the numbers of interruptions outlined above during 2018/19 there were 4 major incidents in our East of England network with a combined interruption duration of 11.6m minutes. These major incidents were all caused by third party interference and are summarised in the table below:

Network	Incident Name	Number of customers interrupted	Average duration of each interruption (minutes)	Total interruption duration (minutes)
EofE	Saxilby	1178	3,154	3,714,869
EofE	Deanshanger	1546	2,656	4,106,359
EofE	Eye	803	2,675	2,147,747
EofE	Wilstead	911	1,826	1,663,163

Developments in interruptions reporting

As part of an Ofgem led group, we have been working with Ofgem and the other Gas Distribution Networks to establish clarity and consistency on definitions and systems and processes for reporting. It is evident from this working group that GDNs are applying different approaches in some cases in RIIO-1 which will cause difficulties in comparative reporting, comparative targets and benchmarking of performance. One area the group is examining is excluding durations arising from delays to work caused by third parties which limit or temporarily prevent restoration of supply. Although we haven't applied this approach in our reporting to date, we are considering doing so in future to highlight the impact this is having in MOBs.

Alongside this we are also examining planned and unplanned data segregation and the different validation approaches that have been used over the years given its complexity and reliance on manual input. For example, we are reviewing our 13/14 and 14/15 reports using the more refined methodology employed in recent years which was not available at the start of RIIO-1.

3. Connections

Guaranteed standards of performance

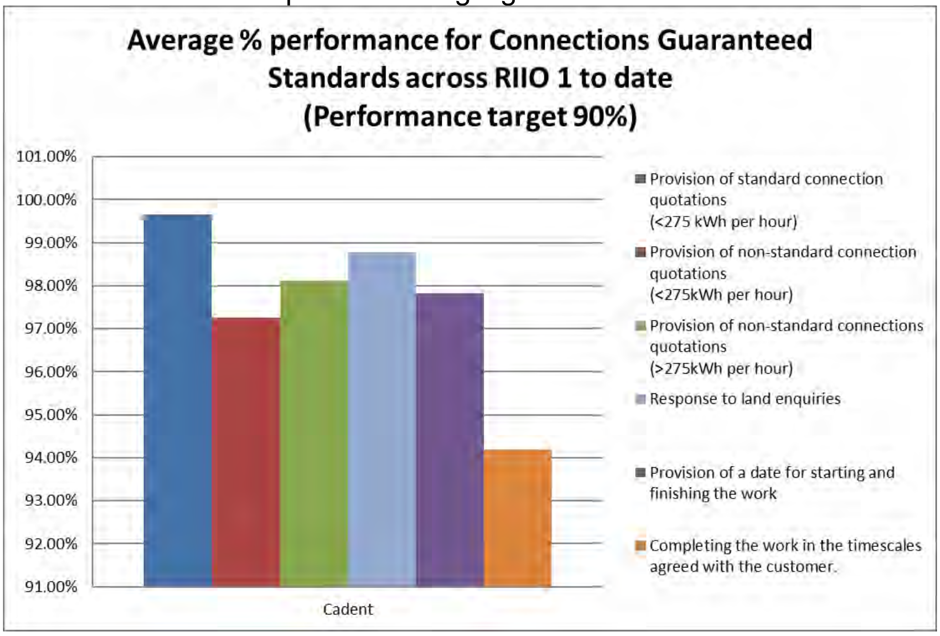
Cadent provides a range of connections services and we continue to encourage competition to promote customer choice reducing costs and enhancing customer service.

During 2018/19 we exceeded the 90% target for each standard across all of our networks and paid compensation as required to the individual customers who did not receive the required level of service.

The table below shows our performance in 2018/19 and across the RIIO-1 period

Activity	EofE	NL	NW	WM	Average across RIIO Period				
Quotation performance	2018/19	201819	201819	2018/19	EofE	NL	NW	WM	Cadent
Provision of standard connection quotations (<275 kWh per hour)	99.84%	99.85%	99.96%	99.94%	99.70%	99.64%	99.65%	99.64%	99.66%
Provision of non-standard connection quotations (<275kWh per hour)	96.76%	96.48%	96.03%	96.02%	97.59%	96.65%	97.37%	97.43%	97.26%
Provision of non-standard connections quotations (>275kWh per hour)	98.36%	98.19%	97.51%	97.48%	97.89%	97.61%	98.60%	98.33%	98.11%
Supporting customers									
Response to land enquiries	98.78%	99.09%	99.14%	99.38%	98.73%	98.88%	98.65%	98.88%	98.78%
Perfomance relating to our connections work									
Provision of a date for starting and finishing the work	98.46%	97.71%	99.14%	97.97%	98.51%	96.05%	98.60%	98.11%	97.82%
Completing the work in the timescales agreed with the customer.	94.01%	91.72%	96.48%	94.53%	93.77%	92.59%	96.73%	93.71%	94.20%

The following graph shows our average performance for each guaranteed standard since the start of the RIIO-1 period and highlights that we have exceeded the 90% standard.



Introduce distributed gas entry standards (scmh connections)

Bio-methane is a renewable gas made from biodegradable matter such as food waste, sewage or energy crops. It has a key role to play in a low carbon economy. During 2018/19 Cadent have connected 3 new biomethane plants and carried out phase 2 commissioning of 3 ‘low flow sites’ bringing the total number of connections to 32 since the start of the price control with 25,103 scmh of green gas (the equivalent of 2.38 TWh of energy) being delivered to the Cadent network per annum. It is worth noting that this year the use of food waste has been the preferred choice of feedstock for the 3 projects we have connected.

The table below shows the volume of connections we have made across the period

RIIO Plan	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
No. projects connected (actual)	1	10	22	28	29	32
TWh Actual	0.07	0.64	1.44	1.78	2.03	2.38

At the start of the period we set ourselves a target to complete 80 connections / 4TWh green gas injected into the network by 2021. This has been more challenging in recent years due to a lower demand for connections caused by delay in the RHI Tariff Guarantee process, however the recent extension of the Tariff Guarantee deadline to 2021 should help to improve the situation and we anticipate that the projects that were previously delayed will now be able to proceed to commissioning by 2020/21.

We continue to work proactively with the community to maximise biomethane connections. Our flexible approach means that we are able to offer connections with variable flow rates to enable connections in capacity restricted areas, in addition we are the only network to facilitate competent 3rd parties undertaking >7barg pipeline design and construction (Cadent still carries out associated assurance activities). It is this flexible approach that has enabled us to increase the number of connections to the >7 barg network with 2 projects commissioning during 2018/19.

The table below shows the breakdown of the types of connections we have made since the start of the price control.

PRESSURE TIER	Previous Years	18/19	Total
Below 7 barg	20	1	21
Above 7 barg (Cadent lay)	1	0	1
Above 7 barg (Self lay)	8	2	10

In addition to our work to facilitate bio-methane connections we are also engaging with customers in response for requests for Compressed Natural Gas vehicle filling installations, gas powered stations and shale gas entry.

4. Customer Service

Measure: Emergency response and repair survey
Planned interruptions survey
Connections survey

In 2018/19 we continued on our journey to become a truly customer centric organisation, as part of this we set ourselves some ambitious targets across both Customer Satisfaction and complaints metrics. Whilst there are a number of positive trends emerging, specifically in customer responsiveness, we fell short of delivering the improvements we expected for our customers in two areas.

Our customer strategy remains focussed on embedding a network orientated operating model with local accountability for customer outcomes. This will be supported by greater levels of data insights and utilisation of technology to improve accessibility to our services and reduce customer effort.

The following sections detail our performance levels in 2018/19 for the three service lines we measure customer satisfaction against, showing the level of improvement made over RIIO-1 and detailing some of the rationale to explain the improvements we have seen and where we are focusing in forthcoming year to deliver further improvements.

Emergency Response and Repair

Within the Emergency Response and Repair process, all networks have continued to meet customers' expectations, with the combined aggregate score for all 4 networks increasing again to 9.35, up from 9.29. We have embedded a real-time feedback and recovery mechanism to help identify and rectify when we are failing to deliver a good customer service. This real time feedback process has allowed us to proactively identify dissatisfaction and has also allowed us to reach different customer segments to help build greater understanding of our customers. Through this new mechanism, performance management and focussed local initiatives, we expect to continue to see incremental improvements across all networks moving forward.

The table below summarises the CSAT scores over GD-1 period.

Emergency Resp. & Repair	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
EofE	9.18	9.29	9.38	9.41	9.44	9.45
Lon	8.84	8.87	9.03	9.06	9.05	9.12
North West	9.21	9.20	9.38	9.38	9.38	9.35
West Midlands	9.06	9.15	9.26	9.27	9.29	9.39

Planned works

Good progress has been made in two of the four networks within Planned Works in 2018/19. East of England and North West have continued to build on the steady improvements seen from the previous year. North London customer satisfaction has decreased marginally after making a big step forward the previous year. Established customer roles within the networks have led to a greater focus on customer performance measurement across the end-to-end process with a continued focus on operational excellence to deliver positive customer outcomes.

We continue however to be disappointed that we are not meeting our customers' expectations in our West Midlands network and continue to face a penalty under the incentive mechanism. Our commitment and focus to improve customer experience in this area remains and we must now ensure that improvement plans and associated actions are driven through the end-to-end process and accompanying supply chain. These plans are centred around improved on-site communications and reinstatement, both in terms of timeliness and overall site tidiness.

The table below summarises the CSAT scores over RIIO-1 period .

Planned Works	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
EofE	8.17	8.03	8.07	8.24	8.46	8.62
Lon	7.90	7.91	7.96	7.82	8.25	8.22
NW	7.68	7.89	7.97	7.64	8.11	8.26
WM	7.96	7.86	7.73	7.80	7.75	7.75

Connections

Through improved workload management and associated reductions in both lead times and right first-time metrics we have delivered improvements in 2018/19 in both North London and West Midlands networks. West Midlands is now performing above the Ofgem target, although North London continues to face a penalty under the incentive mechanism. North West have maintained their improved position from the previous year and remain our strongest performing network in this area. East of England customer service levels have decreased marginally against the previous year, but our focus on ensuring we are effectively sharing best practise to deliver a consistent service across our networks should restore an improving trend.

With our Service transformation programme now well underway we are expecting further improvements across all networks during 2019/20. Given the previous challenges in meeting customer expectations within our North London network, this area has been prioritised to ensure benefits from greater customer focus and relationship management principles will be delivered here as soon as possible.

The table below summarises the average CSAT scores over GD-1 period.

Connections	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
EofE	7.59	7.73	8.13	8.41	8.44	8.22
Lon	6.61	6.55	6.88	7.49	7.17	7.50
NW	8.03	8.30	8.67	8.44	8.69	8.69
WM	7.52	7.95	7.83	7.69	7.85	8.35

Minimum returns (Connections only)

Each year we have a target for the minimum number of survey returns we need in order to inform how our customers perceive the level of service we provide. We have been unable to meet the target for North London despite surveying 100% of the available sample, supported by post-work completion calls to customers highlighting the importance of returning the surveys. We continue to work collaboratively with the other GDNs in readiness for RIIO-2, collectively looking to develop an understanding of alternative surveying methods, including electronic, with the view of removing the minimum surveys returns target and replacing with a commitment to survey 100% of the available sample in Connections.

The table below shows the overall volumes for connection survey responses in 2018/19.

Connections	East of England	North London	North West	West Midlands
No. of responses	1459	308	571	507
Min Return Target	**400**			

Complaints metric

Our improvements in customer responsiveness are evident in our results for 2018/19, building on 2017/18 ensuring we leveraged the benefits from new complaints operating model across our four networks.

The time taken to handle complaints has dropped again markedly. Far less time is spent dealing with the complaint process and hand-offs across the organisation have been reduced. This has been driven by moving accountability and ownership of customer complaints more locally, reducing inefficiencies in the process. The introduction of SMS real time feedback across ER&R and Connections has also aided us on our journey in terms of proactively identifying customer dissatisfaction and acting promptly to resolve issues. In addition we have trialled the use of machine learning and sentiment analysis to further aid understanding of our customers, recognising their frustrations and ensuring we take actions from this learning.

The tables below highlight that all of our networks have significantly improved their complaint metric score from the previous year with performance considerably better than the 11.57 RIIO-1 target.

Network	2017/18		2018/19		RIIO-1 Target
	D+1 Resolution	Score	D+1 Resolution	Score	
EofE	54.61%	5.71	76.58%	2.80	11.57
Lon	45.78%	7.52	73.10%	3.50	11.57
NW	39.73%	7.79	74.97%	3.20	11.57
WM	39.75%	7.62	66.76%	4.23	11.57

Stakeholder engagement

2018/19 has been a transformational year. We have reorganised our business to enable us to embed our enhanced stakeholder engagement and customer strategies within our organisation as well as tailor our services in a way that meets our stakeholders' needs now and in the future.

We recognise that as the biggest gas distribution network in the UK we have the scale and opportunity to shape the industry by using stakeholder insight to make decisions that benefit our 11miillion customers. Whether that's a small number of stakeholders or many thousands, we aspire to deliver their expectations.

This year our engagement has included more than 100 separate engagement events, using approximately 50 different engagement methods and techniques, involving direct discussions with more than 20,000 customers and stakeholders.

Feedback through this engagement, and from the previous year, told us that we could do more to raise awareness of Cadent with our customers and that we lack a clear regional voice to support high quality, regular engagement across each of our four network areas.

This message was heard regularly in customer forums, meetings with MPs and Mayors, public engagement events and day-to-day customer engagement.

Our Stakeholder Strategy is focused on continual improvement – engaging, learning from that engagement, and improving for next time – so we used this feedback to comprehensively reshape our approach to stakeholder engagement and the operation of our business more widely.

To improve the delivery of our services to customers we have reorganised our business, so all activities in our four networks are now managed by Kate Jones (West Midlands network), Jenny Morten (North West network), Darren Elsom (East of England network) and James Harrison (London network), who are our new Network Directors. They are ultimately responsible for everything Cadent does within our network areas including ensuring that we respond to stakeholders' needs.

We have employed four new External Affairs Managers who are tasked with building a regional stakeholder engagement approach in each of their network areas. They are there to listen and ensure we can better respond to the diverse needs of the communities we serve. Our Stakeholder Advisory Panel is evolving to reflect our regional approach to engagement to ensure they are tailored to the needs of local customers and their representatives.

Our stakeholders also told us that they wanted us to be more visible in the communities we serve, so we made the decision to sponsor the Coventry City of Culture 2021. This complements our role as principal sponsor of the British Science Festival at the University of Warwick. These two activities allow us to support, on a regional level, the development of STEM (science, technology, engineering and maths) skills and other training opportunities.

This focus on developing STEM skills runs throughout our regional approach and is a direct result of stakeholder feedback. This year we developed links with universities across our networks – meeting representatives of higher education institutions including the University of Sheffield, Manchester Metropolitan University, Cranfield University and Keele University.

We have also appointed one of our senior female chartered engineers as our STEM ambassador to lead our good work in this area. This significant investment has resulted in a fundamental step-change in the quality and regularity of our regional engagement and we use the insight gained from this engagement to shape our services to meet stakeholders' needs.

This year we have remained active contributors to regional and national energy debates and policy development through various forums, and also engage with stakeholders through our Future of Gas thought leadership papers, which discuss how the gas networks can play a critical role in delivering a low cost and reliable path to decarbonisation.

We launched the world-leading hydrogen HyNet North West project in May 2019, at an event in Manchester attended by more than 100 stakeholders. We continue to work closely with our partners and stakeholders and remain focused and on track to have this operational by the mid-2020s. Similarly, acting on stakeholder feedback, we held a series of workshops and events to facilitate the standardisation of gas distribution network processes – with one stakeholder advising our work had made possible £100m potential investment. We co-ordinated a very successful biomethane engagement day in March 2019, with plans for another later in the year.

5. Social outputs

Fuel Poor connections

We play a key role in helping people to access affordable energy. Fuel Poor customers are defined by multiple criteria, including areas of multiple deprivation and high cost – low income. Fuel Poor connections can be for single domestic qualifying customers, and Community Schemes involving multiple connections to qualifying customers where a mains extension to the network which has been particularly successful in London this year. Indeed Dermot Nolan, Ofgem's Chief Executive was impressed by the works we have done when he visited one of our schemes earlier in 2018/19.

In 2018/19 we have delivered a total of 4,669 Fuel Poor Connections across our networks. 2,608 of these connections were carried out as part of community schemes where volumes have seen a significant increase of about 93% compared with an average of 1,354 in the first 5 years of RIIO-1. 2,061 were one-off connections in fuel poor areas, which is a decrease of c.41% on 17/18 volumes due to the changes in the qualifying criteria introduced by Ofgem. In order to meet the challenge we have introduced initiatives that include:

- Accessing the warm home fund to work with Local Authorities for whole house solution in targeted areas
- Continuation of installing gas on Park home sites as this has been successful in North London network
- Reviewing all connections that have been submitted through our standard connection application route to ensure those who are eligible for a fuel poor connection have access to this service.
- Increased targeting of fuel poor houses using publicly available data.

Carbon Monoxide awareness

Another core element of our work to keep customers safe relates to carbon monoxide, raising awareness and intervening to minimise the risks from this colourless, odourless toxic gas that can escape from poorly maintained flues and appliances. We have achieved this through four key areas: CO education/awareness, Innovation, Influencing and Collaboration

We've participated in the CO GDN collaboration working group which is attended by gas suppliers, gas networks of Ireland and charities, and we've helped to shape the CO agenda in Parliament. Taking this approach, we have promoted best practice sharing and learning across the industry. Some of our most important initiatives, including the All Party Parliamentary Carbon Monoxide Group (APPCOG) partnership, the grant scheme and the CO schools competition originated from the CO working group.

Our dedicated teams issued safety advice leaflets to 294,990 customers, warning them of the dangers and signs of carbon monoxide, and advising them of the three key steps to keep themselves and their loved ones safe. In addition to the training we give directly to individuals, we also work closely with Fire and Rescue services, councils, housing associations and universities and other groups who interact with customers. We supplied 24,162 carbon monoxide alarms to customers at elevated risk. We have continued to roll-out our Safety Seymour campaign, teaching Key Stage 1 schoolchildren about the risks of carbon monoxide through interactive drama. We ran 151 sessions in schools, an average of 3-4 per week during term time reaching thousands of schoolchildren and their families. We are pleased that the other gas distribution networks have adopted the Safety Seymour scheme.

One of the key contributions to our strategy has been the development of heat maps. These have helped us to better understand where within our network we have customers who are at greater than normal risk from CO. With this improved data, we're able to target our partnerships and investment where they can make the biggest impact.

6. Environmental

Shrinkage (Leakage) % reduction

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 operating the gas transportation network. The costs of buying the gas to replace that lost also contributes to customers' bills and so our continued drive to decrease the environmental impact of shrinkage also delivers customer savings.

We continue to make incremental improvements to our operating processes, for example, we are reviewing our pressure management strategy with particular focus this year on optimising benefits between customers who require appropriate gas pressure to operate their appliances and environmental emissions. We are also focusing on leakage reduction through maximising the effectiveness of our mono-ethylene-glycol (MEG) fogging equipment and the investigation of new technologies. Our continued strong performance in optimising pressures and use of MEG has been a great success, but does mean there is little room for further improvement.

Monoethylene Glycol (MEG) Saturation

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 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 2018/19 our overall MEG saturation increased from 30% to 34%. MEG treatment contributed a 4.5GWh reduction in shrinkage against the previous year. Alongside the saturation of MEG in the gas increasing, the zone of influence, which is a measure of how far MEG travels within the distribution network increased. This results in a greater number of lead yarn jointed pipe being treated and a corresponding reduction in shrinkage. In recent years we have focussed on improving MEG output from MEG units with a high concentration of lead and yarn jointed mains within the unit's influence zone. As a result of this we have increased the zone of influence of treated pipe by 9% since 2016/17 and will continue this approach to maximise output and drive saturation improvements.

Current year performance

A summary of the 2018/19 Shrinkage volume performance against the prior year is shown in the table below. Across our four networks shrinkage gas losses were reduced by 55GWh (4.3%). Based on an assumed typical annual consumption of 12,500 kWh, this reduction is equivalent to the gas usage of approximately 4,400 domestic houses.

Reductions were achieved in all four of our networks as shown in the table below with the strongest performance in North London which achieved a 5.7% shrinkage reduction.

2018/19 PERFORMANCE	EAST OF ENGLAND	LONDON	NORTH WEST	WEST MIDLANDS	CADENT
2017/18 SHRINKAGE OUTTURN (GWH)	**439.9**	**227.6**	**321.5**	**280.2**	**1,269.2**
LP / MP MAINS REPLACEMENT	(8.4)	(6.1)	(6.7)	(5.3)	(26.5)
SERVICE RELAYS	(4.1)	(3.1)	(3.5)	(2.6)	(13.2)
AVERAGE SYSTEM PRESSURE	(5.2)	(0.9)	(0.8)	(1.8)	(8.6)
MONOETHYLENE GLYCOL SATURATION	(0.1)	(1.7)	(3.1)	0.4	(4.5)
INTERFERENCE DAMAGES	0.1	0.1	0.0	0.0	0.1
OWN USE GAS	(0.2)	(0.3)	0.0	(0.2)	(0.7)
THEFT OF GAS	(0.4)	(0.5)	0.0	(0.3)	(1.3)
AGI ASSET NUMBERS	0.2	(0.4)	(0.6)	0.7	(0.1)
2018/19 SHRINKAGE OUTTURN (GWH)	**421.8**	**214.5**	**306.9**	**271.1**	**1,214.3**
YEAR ON YEAR REDUCTION (GWH)	***(18.1)***	***(13.1)***	***(14.6)***	***(9.2)***	***(54.9)***
% REDUCTION	***(4.1%)***	***(5.7%)***	***(4.6%)***	***(3.3%)***	***(4.3%)***
NETWORK PERFORMANCE RANKING	***3***	***1***	***2***	***4***	

The biggest reduction in our year on year emissions has come from the delivery of the mains replacement programme which replaces ageing metallic pipes with polyethylene. This contributed 26.5 GWh of the overall reduction in 2018/19.

Cumulative performance

For the first six years of RIIO GD-1, Shrinkage volume reductions of 297.5GWh (19.7%) against opening baselines have been achieved, this is the equivalent to the gas consumption of nearly 23,800 domestic houses. It should be noted that mains replacement rates are already accounted for in the RIIO-1 targets.

Overall shrinkage reductions achieved mainly through repex, repair, pressure management and MEG have enabled us to reduce our overall greenhouse gas emissions by 68% using the government 1990 baseline.

Network level cumulative performance is summarised in the table below.

CUMULATIVE SHRINKAGE VOLUME REDUCTION	EAST OF ENGLAND	LONDON	NORTH WEST	WEST MIDLANDS	CADENT
OPENING SHRINKAGE VOLUME (GWH)	517.4	272.3	394.1	328.0	1,511.8
2018/19 SHRINKAGE OUTTURN (GWH	421.8	214.5	306.9	271.1	1,214.3
CUMULATIVE REDUCTION	(95.5)	(57.8)	(87.2)	(56.9)	(297.5)
% DIFFERENCE	(18.5%)	(21.2%)	(22.1%)	(17.4%)	(19.7%)

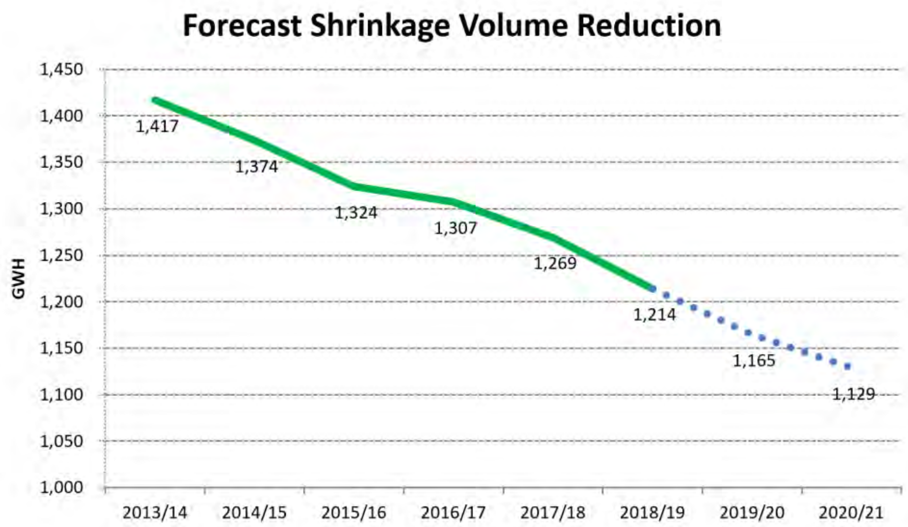
Future forecast

Our current forecast anticipates that we will deliver a further 7% aggregate reduction in Shrinkage volumes over the remainder of RIIO GD-1, and overall reductions of 25.3% for the eight-year period. These forecast assumptions are based on the latest available data for the future mains replacement programme. The forecast assumptions also assume an increase in MEG benefit as a result of our focussed MEG strategy along with year on year reductions in system pressures from those witnessed in 2018/19.

The summary of the expected positions at network level are shown in the table below.

RIIO GD-1 SHRINKAGE VOLUME FORECAST

NETWORK	OPENING	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	NEXT 2 YEARS	8 YEAR TOTAL
EAST OF ENGLAND	517	478	465	449	450	440	422	405	393	(6.9%)	(24.0%)
LONDON	272	257	250	244	239	228	215	209	203	(5.6%)	(25.4%)
NORTH WEST	394	370	356	341	331	322	307	292	281	(8.5%)	(28.7%)
WEST MIDLANDS	328	313	303	290	287	280	271	259	252	(7.0%)	(23.2%)
TOTAL	**1,512**	**1,417**	**1,374**	**1,324**	**1,307**	**1,269**	**1,214**	**1,165**	**1,129**	**(7.0%)**	**(25.3%)**
SHRINKAGE BASELINES (FP)		1,540	1,498	1,460	1,422	1,386	1,348	1,313	1,277		
% DIFFERENCE		(8.0%)	(8.3%)	(9.3%)	(8.1%)	(8.4%)	(9.9%)	(11.3%)	(11.6%)		



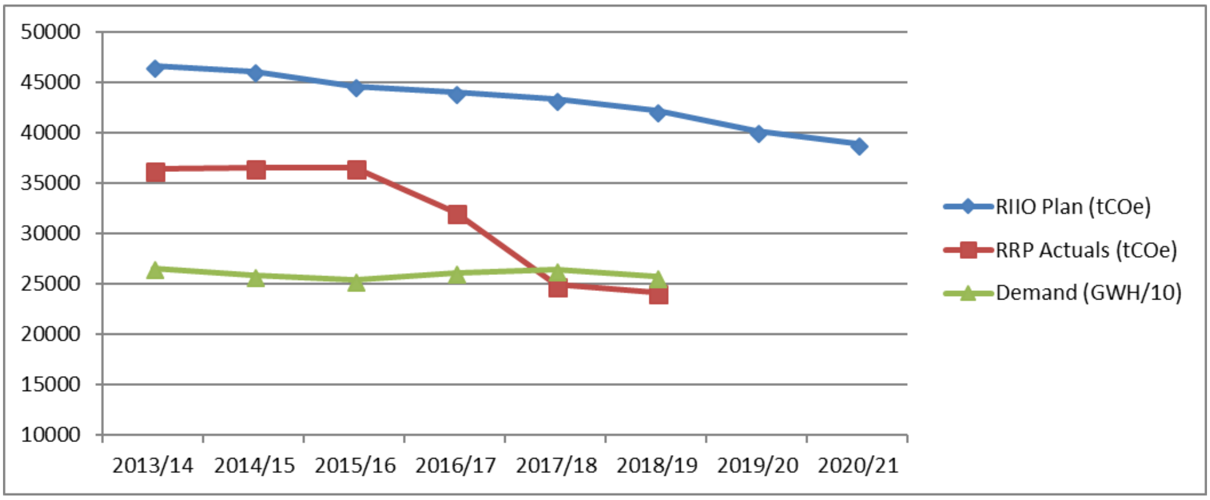
Business Carbon Footprint (BCF)

Our BCF (BCF) measures encompasses a variety of factors, overall, we continue on a pathway to outperform our emissions targets through the RIIO-1 period and for emissions defined in the BCF as Scope 1 and 2, we are ahead of our 2020/21 targets (see below for more detailed information).

The table below highlights actual versus planned performance against the Scope 1&2 measures since the start of the RIIO-1 period with the yellow cells relating to our performance in 2018/19.

Plan	Scope 1	Company Cars	3,120	3,073	3,027	2,982	2,937	2,893	2,580	2,807	
		Commercial Vehicles	18,711	18,617	18,524	18,432	18,340	18,248	18,517	18,066	
		Sub-Totals	21,831	21,690	21,551	21,414	21,277	21,141	21,097	20,873	-4%
	Scope 2	Operational	7,429	7,429	7,092	6,924	6,755	6,419	5,745	5,408	
		Non Operational	17,349	17,002	15,983	15,643	15,304	14,625	13,267	12,588	
		Sub-Totals	24,778	24,431	23,075	22,567	22,059	21,044	19,012	17,996	-27%
		Planned Totals	46,609	46,121	44,626	43,981	43,336	42,185	40,109	38,869	
Actuals	Scope 1	Company Cars	2,674	2,483	2,674	2483	1,945	1,918			
		Commercial Vehicles	16,479	17,148	16,479	17148	16,116	18,159			
		Sub-Totals	19,153	19,631	19,153	19,631	18,061	20,077	0	0	
		Variance against 2020/21 Target	-8%	-6%	-8%	-6%	-13%				
	Scope 2	Operational	9,022	7,250	9,022	7250	5,958	5,322			
		Non Operational	8,383	5,234	8,383	5234	891	811			
`		**Sub-Totals**	17,405	12,484	17,405	12,484	6,849	6,133	0	0	
		Variance against 2020/21 Target	-3%	-31%	-3%	-31%	-62%				
		Actual Totals	36,558	32,115	36,558	32,115	24,910	26,210	0	0	
		Actuals vs 2020/21 Target	-6%	-17%	-6%	-17%	-36%	-32.57%			

The following graph shows the reduction in our reported RRP emissions across the RIIO-1 period compared to energy throughput across all four networks. In 2018/19 there was a small decrease (2.5%) across our networks, however, we continue to make real progress in reducing our BCF as measured in tCO_2e against continuing demand on our networks.



The following is a summary of our performance this year (excluding shrinkage).

- For 2018/19, there is small decrease in Scope 1, 2 and 3 emissions, however, in respect of overall emissions our BCF is broadly the same as for 2017/18. Our forecast continues to show that we are on track to meet or exceed our targets by the end of the RIIO-1 period.
- Scope 2 emissions: These are emissions related to electricity consumption across operational and non-operational sites. In 2018/19 consumption has decreased by over 25%, however, a large proportion of this is accounted for by a reduction in the published DEFRA conversion factor.
- Scope 3 emissions: Emissions reduced by 6% compared to the previous year. Emissions associated with PE pipe procurement decreased 6% through the reporting year.
- Travel: Emissions associated with travel air, rail, and casual mileage were broadly similar to the previous year. Emissions associated with company car use decreased by a further 15% reflecting our business focus on reducing business mileage and more emissions efficient vehicles.

Overall, the target performance is to reduce our aggregate Scope 1 and 2 emissions by 20% during RIIO-1 from a 2012/13 level of 48,691 tCO2e. Our performance is ahead of pathway to meet the target.

- For Scope 1 emissions the target is to reduce emissions in scope by 5% by the end of the RIIO-1 period. This target comprises all emissions from commercial vehicles and company cars. In 2018/19, we reported 20077 tCO_2e, this is already 4% lower than our 8year RIIO-1 target of 20,873 tCO_2e.

- For Scope 2 emissions the target is to reduce emissions in scope by 27% by the end of the RIIO-1 period. This target comprises emissions associated with electricity consumption at all operational and non-operational sites. In 2018/19, we reported 8676 tCO_2e, this is 48% lower than our 8year RIIO-1 target of 17,996 tCO_2e.

Innovation

The RIIO-1 framework incentivises and funds research and development and this section of the report discusses how we have used those funds and will briefly outline some of the initiatives we have been exploring.

2018/19 is the sixth year of Network Innovation Allowance (NIA) funding under RIIO. Over the six years we have invested over £40 million across 172 NIA projects. This year we have spent £4.8 million on an additional 22 projects. In 17/18 we anticipated that we would implement 2 projects, Optomole and Sensit (portable gas detection devices for locating gas leaks). For Optomole a commercial agreement is now in place with one of our networks and the progress will be monitored and benefits assessed before we roll out company wide. For our Sensit project, we have purchased circa 20 units and since March the Sensit device has been in use in the London network. The early indications show that where this has been used the time taken to complete these jobs has halved.

We have undergone a transition from the former Innovation Funding Incentive (IFI) to the innovation funding stimulus under RIIO, which consists of the Network Innovation Allowance (NIA) and Network Innovation Competition (NIC). Through this mechanism we currently have a portfolio of 64 projects, 30 of these have been carried out collaboratively with the other Gas Network Operators. This has provided a minimum of a 2:1 funding ratio, based on Cadent owning 4 of the 8 networks, further leveraging the NIA funding opportunity for our customers. By the end of March 2019 16 projects had been completed.

Total NIA expenditure in 2018/19 is £4.8m against a maximum NIA Allowance of £12.5m. The spend this year is lower than previous years, mainly due to the change in emphasis towards new smaller projects with shorter delivery horizons than previous years.

Innovation project delivery

In 2018/19 our NIA spend was split across our six Strategic Value areas as shown:

- Distribution Mains Replacement – 19%
- Environment and Low Carbon – 6%
- Future of Gas – 31%
- Reliability and Maintenance – 19%
- Repair – 16%
- Safety and Emergency – 9%
- Security- 0%

Below are some highlights from our sixth year of innovation delivery under RIIO. These projects represent a cross section of our portfolio of projects, demonstrate a range of different benefits, and are at various phases in terms of their project lifecycle.

Future role of gas

As outlined in the performance summary section in pages 15 & 16 we are committed to making the UK a world leader in Hydrogen production and use. By promoting the use of hydrogen in a number of applications across the UK, we are also helping others to see the wider potential benefits – to the economy, to job creation and for intellectual capital - and the opportunity to create a hydrogen economy to make the UK a world leader in this area. We are particularly proud of our work on Hynet which is creating a vision for a hydrogen network for the Northwest between Merseyside and Greater Manchester conurbations. If taken forward it could revolutionise energy use in the UK and create new jobs and stimulate the economy at the same time as making a significant impact on meeting government road to zero targets.

In addition, our Hydeploy project with Keele University to blend methane and 20% Hydrogen is progressing so successfully that a larger scale trial within a public network is being planned.

The HyDeploy area at Keele University
Hydrogen production and blending will need Government enablement and a suitable operational, regulatory and commercial framework.

Hydeploy at Keele area

- **100 houses**
- **30 faculty and multi occupancy buildings**

The energy networks will play a vital role in supporting the Government as they gather evidence for strategic decisions to be taken. A lot of technical work to show the capability of the gas network to support the transition is already in train. Getting real feedback based upon actual experiences through large scale trials will provide the strong evidence base required. The HyDeploy project is a firststep in demonstrating blending at scale.

HyDeploy2

Our Future of Gas activities are designed to address these principal requirements:

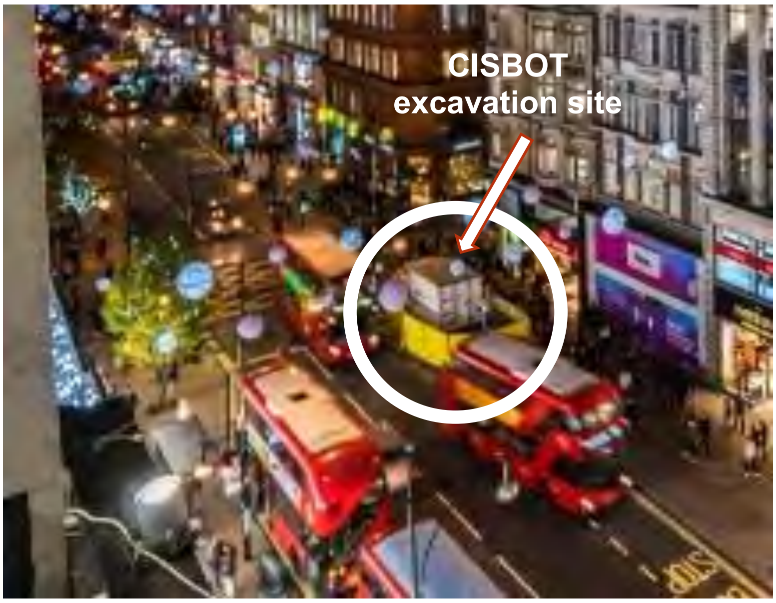
- Engaging with stakeholders to encourage partnership working towards real workable solutions.
- Developing and supporting technologies that can lower emissions now.
- Providing evidence to inform policy decisions on future investment in decarbonizing the
- energy market.
- Identifying the optimal energy solution for each region of the UK and its gas network.
- Respecting regional differences enables us to harness the natural attributes of an area to generate energy.

Cadent
Your Gas Network

Other Innovation Highlights 2018/19

<table>
<tr><td colspan="2">Minimising disruption - focusing our efforts on improving the way we work</td></tr>
<tr><td>CISBOT

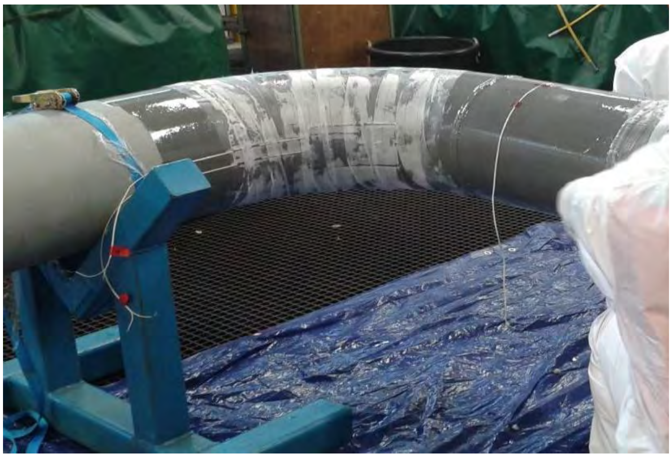
An innovation recently introduced into the UK from the United States and now being used by both Cadent and SGN in North and South London where traffic congestion makes conventional mains replacement difficult, CISBOT is an illustration of how innovation can bring major benefits to customers and stakeholders.

This photograph is taken in central London on Oxford Street where the relatively small footprint of CISBOT allows large diameter mains joints to be sealed internally to prevent gas escapes due to lead yarn joint failure. Transport for London and Local Authorities fully support the use of this technology as it minimises congestion compared to full mains replacement that might require road closures and it enables local shops and businesses to trade normally with little disruption. While the costs of this technology are comparable with mains replacement, the savings to highway authorities, businesses and reduced disruption to commuters make this a very attractive alternative in central London.</td><td></td></tr>
<tr><td>Above Ground Crossing Inspection Mapping

Develop a cost effective technical solution to undertake the visual inspection of pipe bridge structures utilising various technologies to capture, process and store the information relating to the structure and pipeline with the aim of improving asset data quality. The solution aims to provide an efficient and lower cost method to obtain a consistent deliverable that can be uploaded to and accessed via a cloud based solution within Cadent.

Benefits include
• Improvements in time, efficiency, cost and visual data.
• Data improvements in collection, storage capability, processing and access to view.

Field trials have been carried out using manual inspection & drone surveys, this was carried out at 3 sites within the Cadent network. Initial feedback has been positive with visual outputs being well received within the business. Comparison of the two techniques is still to be fully assessed.</td><td></td></tr>
</table>

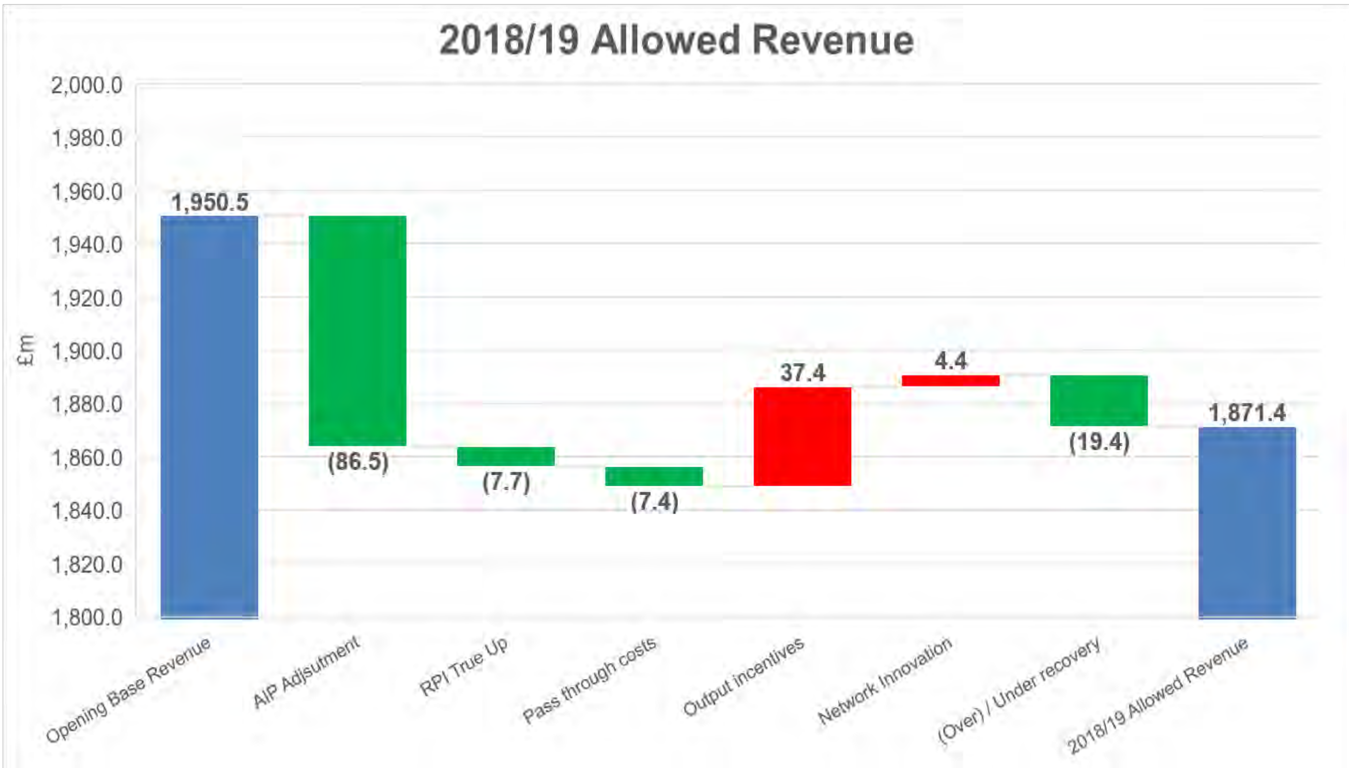
Composite Repairs for Complex Geometries Composite repairs are carbon fibre fabric designed to give strength in the hoop and axial directions focusing on through wall, blunt, metal loss defects such as corrosion, and gouges in Tee's, bends and elbows. **Benefits include** • A reduction in disruption to the network and customers. • A reduction in the period over which the pipeline is operating at a reduced pressure until the repair is undertaken. • A more cost-effective repairs; i.e., the process of design, fabrication (required for a steel shell), and installation. • Security of supply; should an emergency arise, resulting in isolation of a section of the pipeline, the composite repair system will enable a quicker repair than a steel sleeve.	 Composite repairs installation during laboratory test.
Kobus Pipe Puller – Stage 2 The Kobus Pipe Puller project is a trenchless technique for the replacement of gas service pipes with a diameter of less than 1 ¼" with a focus on ¾". The Pipe Puller provides the ability to pull a steel service out of the ground whilst pulling a new PE service into the void behind it. **Benefits:** • The ability to accommodate PE insertion of ¾" services which are currently too small for insertion techniques and need to be either open cut or moled • Reduced disruption to customer due to the reduced excavation size and time involved with an open cut or moled replacement • Reduced reinstatement costs involved with the smaller excavation Trials for the Kobus pipe pulling technology will take place from June 2019 and any learning points from the trial will inform any incremental changes required to the technology before implementation for use across Cadent.	 

Cadent
Your Gas Network

Financial Performance

Transportation Revenue - Allowed Revenue

Final 2018/19 Allowed Revenue for Cadent's networks was £1,871.4m. A high level summary is shown in the chart and table below:



Allowed Revenue Summary (2018/19 Prices)	East of England	London	North West	West Midlands	Cadent
Opening base revenue	654.3	463.9	475.2	357.3	1,950.5
Annual Iteration Adjustment	(17.2)	(31.4)	(22.3)	(15.5)	(86.5)
RPI True Up	(2.5)	(1.8)	(1.9)	(1.4)	(7.7)
2018/19 Base Revenue	**634.5**	**430.6**	**450.9**	**340.4**	**1,856.4**
Pass through costs	(4.9)	(2.2)	(0.4)	0.2	(7.4)
Exit Capacity incentive	9.6	4.6	4.8	2.3	21.2
Shrinkage incentive	0.4	0.3	0.3	0.2	1.1
Environmental Emissions incentive	2.1	1.5	1.6	1.4	6.7
Broad Measure of Customer Satisfaction	4.1	1.1	2.2	1.0	8.4
Discretionary Reward Scheme	-	-	-	-	-
Network Innovation Allowance	1.6	0.9	1.1	0.8	4.4
O(over) / Under Recovery brought forwards	(4.7)	(4.3)	(7.8)	(2.6)	(19.4)
2018/19 Allowed Revenue	**642.7**	**432.4**	**452.6**	**343.6**	**1,871.4**

Annual Iteration Adjustment

The reduction to Base Revenue arising from the November 2017 Annual Iteration Process was £86.5m in 2018/19 prices.

Annual Iteration Adjustment (2018/19 Prices)	East of England	London	North West	West Midlands	Cadent
Cost of Debt indexation	(18.7)	(13.0)	(13.1)	(10.0)	(54.7)
Pension deficit funding	8.3	4.5	5.4	4.0	22.1
Totex Incentive Mechanism	(5.8)	(18.9)	(8.0)	(2.8)	(35.5)
Shrinkage allowance reduction	(4.6)	(2.0)	(3.6)	(2.3)	(12.4)
Tax adjustments	(3.0)	(2.5)	(2.3)	(1.8)	(9.6)
Reduction to Xoserve costs	(3.7)	(2.2)	(2.6)	(2.1)	(10.5)
Enhanced site secutiry uncertainty adj	10.6	4.0	2.7	-	17.3
Fuel poor network connection uncertainty adj	0.3	-	1.0	0.9	2.3
Specified streetworks uncertainty adj	-	0.7	0.5	-	1.2
Tier 2a repex revenue driver	(0.5)	(1.3)	(1.6)	(0.9)	(4.4)
Other PCFM adjustments	(0.1)	(0.7)	(0.8)	(0.5)	(2.2)
Total Annual Iteration Adjustment (2018/19 prices)	**(17.2)**	**(31.4)**	**(22.3)**	**(15.5)**	**(86.5)**
Total Annual Iteration Adjustment (2009/10 prices)	**(13.1)**	**(23.9)**	**(17.0)**	**(11.8)**	**(65.8)**

63% of this reduction was driven by cost of debt indexation, with the allowed percentage for the year determined at 1.91%, relative to the opening position of 2.92% in the RIIO-1 Final Proposals, demonstrating again how this mechanism has driven tangible savings for customers.

The next largest contributor to the reduction was totex performance, representing £35.5m or 41% of the total. This is particular pronounced in the London network owing to the previous repayment of repex allowances in respect of work on the medium pressure system that will no longer take place in RIIO-1.

Following separation from National Grid, Cadent's pensions liabilities were sectionalised, with ongoing funding being set exclusively through base revenue, removing the element previously paid to National Grid via pass through costs in the longer term. This change equates to +£22m of the 2018/19 Annual Iteration Adjustment total.

The adjustment includes £12m of the Shrinkage cost allowance reduction referred to previously, representing around 14% of the total.

The RIIO-1 Price Control Financial Model includes detailed tax calculations, which adjust annually for material changes. Around 11% of the Annual Iteration Adjustment total relates to reduction in Corporation Tax rates relative to the opening assumption included in the Final Proposals, the actual Corporation Tax rate for the year being 19%, versus the 21% originally assumed.

The November 2017 Annual Iteration Adjustment included the effect of agreed adjustment to allowances for items subject to Uncertainty Mechanisms namely, Enhanced Site Security, Fuel Poor Network Connections, Specified Streetworks, Tier 2A Replacement Expenditure, and revisions to Xoserve costs following the Funding, Governance and Ownership review (FGO).

Revenue Collection

Revenue collection in 2018/19 was £8.1m or 0.4% higher that final allowed revenue. Roughly half of the variance arose from in-year changes to allowed revenue relative to the positions assumed when setting prices:

- Reductions to Network Innovation expenditure resulted in £3.6m of the over recovery
- Net theft of gas recoveries in 2018/19 (which cannot be estimated prospectively) contributed £0.8m of the difference
- The remainder was the consequence of changes to chargeable volumes:
  - Commodity driven revenue, which represents around 3% of the total turned out to be largely in line with expectations. The prolonged good weather followed by a mild winter would intuitively point towards the expectation of under collection, however we conclude that the relationship between weather and common holiday periods had a bearing, and the degree of downward swing in temperatures from unusually clement to more normal level also affected consumption patterns (i.e. the degree of temperature change made it feel colder)
  - When setting year ahead transportation prices, we need to make an assumption about how supply point volumes might change during the year. If the outturn position is lower than this assumption, this drives and under recovery, and conversely if higher, this drives an over recovery. In 2018/19 we observed supply point growth higher than our price setting assumption driving a full year over recovery of 0.2%

Revenue Collection	East of England	London	North West	West Midlands	Cadent
2018/19 Allowed Revenue	**642.7**	**432.4**	**452.6**	**343.6**	**1,871.4**
2018/19 Collected Revenue	**645.9**	**434.7**	**453.8**	**345.0**	**1,879.5**
(Over) / Under Recovery of Revenue	**(3.2)**	**(2.3)**	**(1.2)**	**(1.4)**	**(8.1)**
% (Over) / Under Recovery of Revenue	**(0.5%)**	**(0.5%)**	**(0.3%)**	**(0.4%)**	**(0.4%)**
(Over) / Under Recovery of Revenue represented by:					
Reduction in Network Innovation expenditure	*(1.3)*	*(0.7)*	*(0.9)*	*(0.6)*	*(3.5)*
Net theft of gas recoveries	*(0.2)*	*(0.4)*	*(0.1)*	*(0.1)*	*(0.8)*
Variance in chargeable volumes	*(1.7)*	*(1.2)*	*(0.2)*	*(0.7)*	*(3.8)*

Allowed Revenue Forecast

We anticipate continued reduction in Allowed Revenue forecasts in real terms across the remainder of RIIO-1, with closing revenue currently forecast to be 9.5% lower than opening positions.

Relative to the RIIO-1 Final Proposals, we expect total allowed revenue for the price control period to be around £387m lower in 2018/19 prices. The chart below summarises our current allowed revenue projections for RIIO-1 in 2018/19 prices.


8 Year Allowed Revenue Forecast vs Final Proposals
15,700
15,500
15,300
15,100
14,900
14,700
14,500
15,728
(381)
(144)
(68)
(70)
(49)
(51)
49
131
217
(58)
36
15,342
Base revenue per final proposals
Cost of debt indexation
Shrinkage costs
Inflation true up
Exit capacity costs
Reduced corporation tax rates
Totex Performance (inc uncertainty)
Network innovation Allowance
Pass through costs
Output incentives
Under / over collection
Other
8 Year Forecast

Output Incentives

With the exception of exit capacity, which isn't referenced elsewhere in the strategic narrative, the following section describes our performance against our incentives. Further details to accompany this narrative are provided in our output performance summaries in section 4. The tables below show our performance for 2018/19 versus the RIIO-1 target, cumulative performance to date and 8 year forecast including incentive revenue and RORE impact.

Exit Capacity

Our primary consideration when assessing our capacity booking strategy is to ensure that we meet our 1 in 20 reliability obligation. Incentive performance is driven by our ability to meet this obligation, at the same time reducing our capacity bookings in absolute terms relative to the RIIO-1 volume targets by closely monitoring background demand conditions, and by maximising bookings at the cheapest offtakes wherever possible. We minimise our reliance on NTS capacity by utilising the intrinsic flexibility of our networks, with our facilitation of new biomethane connections also assisting in this regard to a small extent. This benefits consumers by avoiding exit capacity costs that would otherwise be charged by National Grid.

As a consequence of the adverse weather conditions experienced in 2017/18, we have bolstered our capacity booking strategy resulting in a very minor year on year performance reduction in two networks, but our continued strong performance is a reflection of the resilience of our approach which not only safeguards network reliability but also results in lower exit capacity charges being levied on our customers.

We always aim to minimise our capacity bookings with National Grid. Whilst this may result in a degree of outturn improvement, we do not at this stage anticipate any material departure from the 8 year forecast positions shown in the table below on account of the general stability in capacity requirements:

Exit Capacity Incentive Performance Summary

Exit Capacity	Current Year				RIIO-GD1 to Date			8 Year Forecast			
Network	PERFORMANCE VS TARGET	CHANGE TO PRIOR YEAR	INCENTIVE REVENUE (£M)	RORE IMPACT	PERFORMANCE VS TARGET	INCENTIVE REVENUE (£M)	RORE IMPACT	PERFORMANCE VS TARGET	INCENTIVE REVENUE (£M)	RORE IMPACT	DIRECTION OF TRAVEL
East of England	(28.9%)	(1.6%)	9.2	+0.68%	(24.3%)	47.9	+0.58%	(25.3%)	60.3	+0.55%	▲
London	(18.6%)	0.1%	4.0	+0.42%	(16.1%)	21.3	+0.38%	(16.5%)	26.8	+0.35%	▲
North West	(13.1%)	0.4%	5.0	+0.53%	(10.1%)	22.9	+0.40%	(10.6%)	30.9	+0.40%	▲
West Midlands	(10.0%)	(0.1%)	2.1	+0.29%	(9.0%)	11.2	+0.26%	(9.7%)	15.4	+0.27%	▲

Shrinkage & Environmental Emissions

These two factors contribute to the overall shrinkage incentive. The Environmental Emissions Incentive rewards networks for reductions in the carbon impact of fugitive emissions against a baseline target. The underlying data to derive incentive performance is same as used for the Shrinkage incentive (the difference being that Shrinkage includes the assumed impact of own use gas, and theft of gas), therefore the drivers of incentive performance are largely the same, although the underlying rationale of the incentive mechanism is on environmental impact.

Shrinkage

Our shrinkage incentive performance is shown in the table below. Our current forecast anticipates that we will deliver a further 7% aggregate reduction in Shrinkage volumes over the remainder of RIIO-1, and overall reductions of 25% for the eight year period. These forecast assumptions are based on latest available data for the future mains replacement programme. We also anticipate that our focussed MEG strategy will drive further improvements to mono ethylene glycol saturation, along with year on year system pressure management improvements from the levels observed in 2018/19.

Shrinkage Incentive Performance Summary

Shrinkage	Current Year				RIIO-GD1 to Date			8 Year Forecast			
Network	PERFORMANCE VS TARGET	CHANGE TO PRIOR YEAR	INCENTIVE REVENUE (£M)	RORE IMPACT	PERFORMANCE VS TARGET	INCENTIVE REVENUE (£M)	RORE IMPACT	PERFORMANCE VS TARGET	INCENTIVE REVENUE (£M)	RORE IMPACT	DIRECTION OF TRAVEL
East of England	(9.7%)	(1.5%)	0.7	+0.05%	(18.5%)	3.7	+0.04%	(24.0%)	5.4	+0.05%	▲
London	(14.9%)	(2.7%)	0.7	+0.08%	(21.2%)	2.8	+0.05%	(25.4%)	3.8	+0.05%	▲
North West	(8.1%)	(1.0%)	0.5	+0.05%	(22.1%)	2.1	+0.04%	(28.7%)	3.4	+0.04%	▲
West Midlands	(8.1%)	(0.9%)	0.4	+0.06%	(17.4%)	1.9	+0.04%	(23.2%)	3.0	+0.05%	▲

Environmental Emissions

Across our four networks, leakage losses were reduced by 53GWh (5%) in the year against 2017/18. This was 10% better than RIIO-1 baseline targets for the year. Cumulatively, we have achieved leakage reductions of 20%, and forecast that this will increase to 26% by the end of the price control period.

Environmental emissions Incentive Performance Summary

Environmental Emissions	CURRENT YEAR				RIIO GD-1 TO DATE			8 YEAR FORECAST			
NETWORK	PERFORMANCE VS TARGET	CHANGE TO PRIOR YEAR	INCENTIVE REVENUE (£M)	RORE IMPACT	PERFORMANCE VS TARGET	INCENTIVE REVENUE (£M)	RORE IMPACT	PERFORMANCE VS TARGET	INCENTIVE REVENUE (£M)	RORE IMPACT	DIRECTION OF TRAVEL
East of England	(10.0%)	(1.5%)	3.1	+0.23%	(18.7%)	17.0	+0.20%	(24.8%)	26.3	+0.24%	▲
London	(15.2%)	(2.6%)	3.2	+0.33%	(21.3%)	12.8	+0.23%	(26.5%)	17.7	+0.23%	▲
North West	(8.6%)	(1.4%)	2.2	+0.23%	(22.7%)	10.0	+0.17%	(29.5%)	15.9	+0.21%	▲
West Midlands	(8.7%)	(0.8%)	1.9	+0.26%	(17.4%)	9.4	+0.22%	(23.6%)	13.2	+0.23%	▲

Customer Satisfaction: Planned Work

Performance in the year reflects our continuing journey in this area of Customer Satisfaction with three out of four networks exceeding target levels, and two networks showing year on year improved performance. The RIIO-1 to date position below is based on average scores achieved, with associated incentive revenue/penalty, we are disappointed that we are not meeting our customers' expectations in our West Midlands network and continue to face a penalty under the incentive mechanism.

Customer Satisfaction: Planned Work Incentive Performance Summary

CSat: Planned Work	Current Year				RIIO-GD1 to Date			8 Year Forecast			
Network	PERFORMANCE VS TARGET	CHANGE TO PRIOR YEAR	INCENTIVE REVENUE (£M)	RORE IMPACT	PERFORMANCE VS TARGET	INCENTIVE REVENUE (£M)	RORE IMPACT	PERFORMANCE VS TARGET	INCENTIVE REVENUE (£M)	RORE IMPACT	DIRECTION OF TRAVEL
East of England	+0.53	+0.16	1.1	+0.08%	+0.18	2.5	+0.03%	+0.91	4.6	+0.04%	▲
London	+0.13	(0.03)	0.2	+0.02%	(0.08)	(0.5)	(0.01%)	+0.91	0.9	+0.01%	▲
North West	+0.17	+0.15	0.3	+0.03%	(0.17)	(1.3)	(0.02%)	+0.81	0.2	+0.00%	▲
West Midlands	(0.34)	-	(0.3)	(0.05%)	(0.28)	(1.7)	(0.04%)	+0.41	(0.6)	(0.01%)	▲

All £ values are expressed in 2018/19 prices and exclude lagged revenue impacts.

Customer Satisfaction: Unplanned work

We have achieved another year of strong performance in the Unplanned Work category, with prior year performance broadly maintained, and Customer expectations exceeded for the fourth consecutive year.

Our forecast reflects our ambition to continue to drive year on year performance through to the end of RIIO-1.

Customer Satisfaction: Unplanned Work Incentive Performance Summary

Csat: Unplanned Work	Current Year				RIIO-GD1 to Date			8 Year Forecast			
Network	PERFORMANCE VS TARGET	CHANGE TO PRIOR YEAR	INCENTIVE REVENUE (£M)	RORE IMPACT	PERFORMANCE VS TARGET	INCENTIVE REVENUE (£M)	RORE IMPACT	PERFORMANCE VS TARGET	INCENTIVE REVENUE (£M)	RORE IMPACT	DIRECTION OF TRAVEL
East of England	+0.64	+0.01	1.1	+0.08%	+0.55	6.7	+0.08%	+0.79	8.8	+0.08%	▲
London	+0.31	+0.07	0.7	+0.08%	+0.19	3.5	+0.08%	+0.64	4.9	+0.06%	▲
North West	+0.54	(0.03)	0.8	+0.08%	+0.51	4.8	+0.08%	+0.79	6.3	+0.08%	▲
West Midlands	+0.58	+0.10	0.6	+0.08%	+0.43	3.6	+0.08%	+0.79	4.7	+0.08%	▲

All £ values are expressed in 2018/19 prices and exclude lagged revenue impacts.

Customer Satisfaction: Connections

We have delivered improvements in 2018/19 in both North London and West Midlands networks. West Midlands is now performing above the Ofgem target, although North London continues to face a penalty under the incentive mechanism. Our service transformation programme is now well underway and we are expecting further improvements across all networks during 2019/20.

Customer Satisfaction: Connections Incentive Performance Summary

Csat: Connections	Current Year				RIIO-GD1 to Date			8 Year Forecast			
Network	PERFORMANCE VS TARGET	CHANGE TO PRIOR YEAR	INCENTIVE REVENUE (£M)	RORE IMPACT	PERFORMANCE VS TARGET	INCENTIVE REVENUE (£M)	RORE IMPACT	PERFORMANCE VS TARGET	INCENTIVE REVENUE (£M)	RORE IMPACT	DIRECTION OF TRAVEL
East of England	+0.18	(0.22)	0.5	+0.04%	+0.05	1.8	+0.02%	+1.06	3.9	+0.02%	▲
London	(0.54)	+0.33	(0.5)	+0.04%	(1.01)	(4.2)	(0.08%)	+0.46	(2.8)	(0.08%)	▲
North West	+0.65	-	0.8	+0.04%	+0.43	3.7	+0.06%	+1.11	5.2	+0.06%	▲
West Midlands	+0.31	+0.50	0.5	+0.04%	(0.18)	(0.6)	(0.01%)	+0.46	0.5	(0.01%)	▲

All £ values are expressed in 2018/19 prices and exclude lagged revenue impacts.

Complaints Handling

Our forecast assumes maintenance of 2018/19 actual positions, and an expectation of continued performance well above target and consequently no impact to revenues or RORE for this penalty only incentive.

Complaints Handling Incentive Performance Summary

Complaints	Current Year				RIIO-GD1 to Date			8 Year Forecast			
Network	PERFORMANCE VS TARGET	CHANGE TO PRIOR YEAR	INCENTIVE REVENUE (£M)	RORE IMPACT	PERFORMANCE VS TARGET	INCENTIVE REVENUE (£M)	RORE IMPACT	PERFORMANCE VS TARGET	INCENTIVE REVENUE (£M)	RORE IMPACT	DIRECTION OF TRAVEL
East of England	(9.10)	(3.24)	-	-	(3.69)	-	-	(9.10)	-	-	▶
London	(8.27)	(4.22)	-	-	(2.35)	-	-	(8.27)	-	-	▶
North West	(8.55)	(4.77)	-	-	(3.18)	-	-	(8.55)	-	-	▶
West Midlands	(7.34)	(3.39)	-	-	(2.88)	-	-	(7.34)	-	-	▶

All £ values are expressed in 2018/19 prices and exclude lagged revenue impacts.

Stakeholder Engagement

In July 2019, we were awarded a score of 6.33 by the Stakeholder Engagement panel for our 2018/19 submission.

The SEIS panel noted a significant improvement in our stakeholder engagement approach and delivery in 2018/19 from previous years, in particular a step change underpinned by increased investment, leading to far greater scale of engagement. Last year marked the start of our business transformation programme, which is creating a far more regionally aligned operating model. This has allowed us to engage with customers and stakeholders from a regional focal point, creating much clearer and more focused plans and outcomes. Our transformation will continue through 2019/20 as organisational structures are fully populated and good practice identified in a series of pilots across the country are scaled up. Our engagement plans for 2019/20 are even more ambitious than 2018/19, with greater scale still, but more focus on measuring the benefits of engagement through the continued application of our Social Return on Investment tool.

Given the nature of the incentive, forecast for the final two years of RIIO-1 is difficult to predict. The assumption in the table below reflects achievement of annual scores of 6.0 for the periods 2019/20 to 2020/21.

Stakeholder Engagement Incentive Performance Summary

Stakeholder Engagement	Current Year				RIIO-GD1 to Date			8 Year Forecast			
Network	SCORE	CHANGE TO PRIOR YEAR	INCENTIVE REVENUE (£M)	RORE IMPACT	AVERAGE SCORE	INCENTIVE REVENUE (£M)	RORE IMPACT	FORECAST CLOSING SCORE	INCENTIVE REVENUE (£M)	RORE IMPACT	DIRECTION OF TRAVEL
East of England	6.33	+0.33	1.5	+0.11%	6.53	10.0	+0.12%	6.00	12.5	+0.11%	▶
London	6.33	+0.33	1.0	+0.11%	6.53	7.0	+0.12%	6.00	8.6	+0.11%	▶
North West	6.33	+0.33	1.1	+0.11%	6.53	7.2	+0.12%	6.00	9.0	+0.12%	▶
West Midlands	6.33	+0.33	0.8	+0.11%	6.53	5.4	+0.12%	6.00	6.7	+0.12%	▶

All £ values are expressed in 2018/19 prices and exclude lagged revenue impacts.

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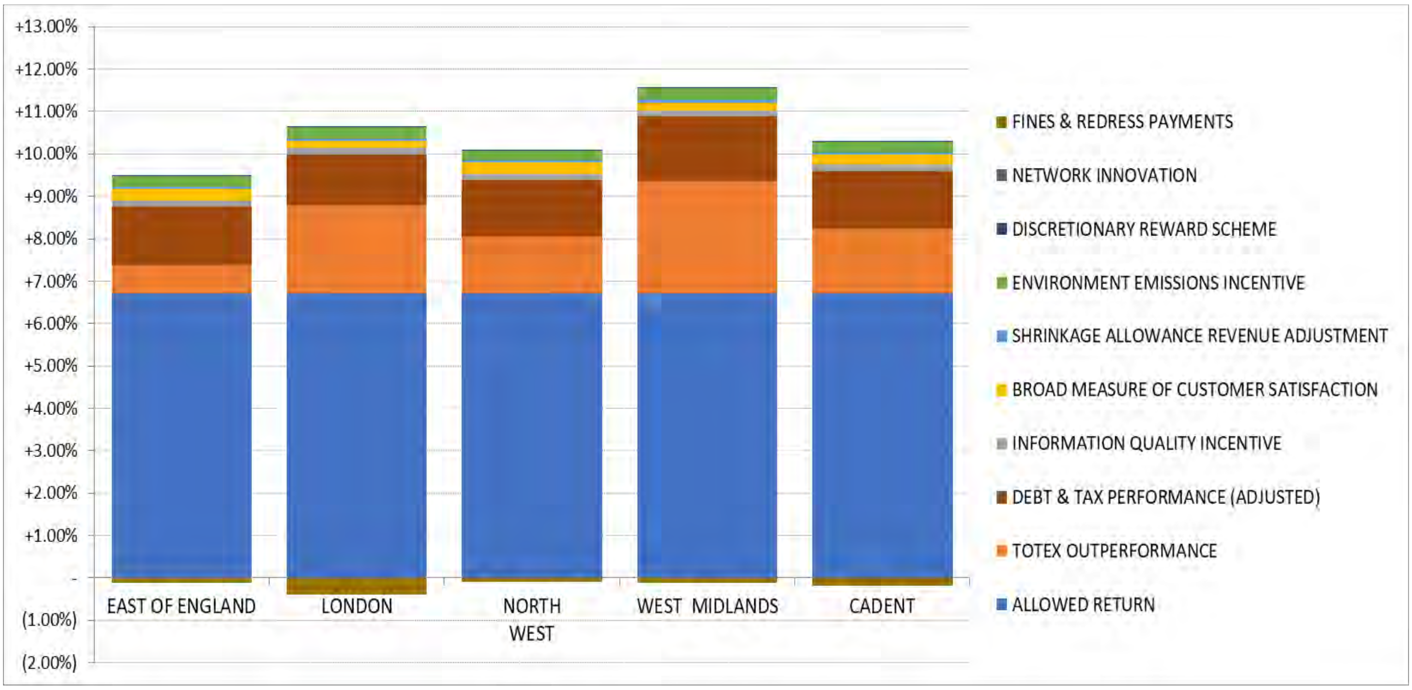
Return on Regulatory Equity (RORE)

Our current eight year RORE forecast is summarised in chart and table below. Our method of RORE calculation is aligned to the approach used within the RFPR templates. We have endeavoured to ensure that the forecast reflects our best available view of eight year RORE performance, reflecting the revised totex positions submitted in the 2019 RRP, inclusive of the expected consequential effect to RAV balances.



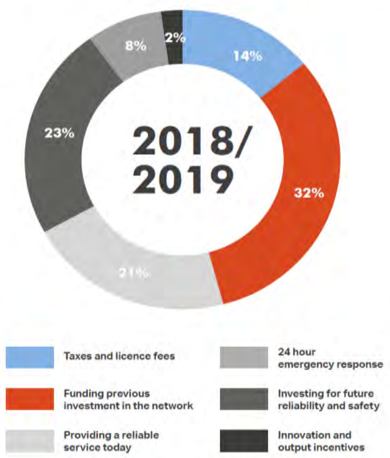
RORE PERFORMANCE		RIIO GD-1			
CATEGORY	EAST OF ENGLAND	LONDON	NORTH WEST	WEST MIDLANDS	CADENT
ALLOWED RETURN	+6.70%	+6.70%	+6.70%	+6.70%	+6.70%
TOTEX OUTPERFORMANCE	+0.68%	+2.09%	+1.35%	+2.67%	+1.53%
INFORMATION QUALITY INCENTIVE	+0.13%	+0.17%	+0.14%	+0.14%	+0.14%
BROAD MEASURE OF CUSTOMER SATISFACTION	+0.27%	+0.16%	+0.27%	+0.20%	+0.23%
SHRINKAGE ALLOWANCE REVENUE ADJUSTMENT	+0.05%	+0.05%	+0.04%	+0.05%	+0.05%
ENVIRONMENT EMISSIONS INCENTIVE	+0.25%	+0.26%	+0.23%	+0.29%	+0.25%
DISCRETIONARY REWARD SCHEME	+0.00%	+0.00%	+0.00%	+0.00%	+0.00%
NTS EXIT CAPACITY	+0.55%	+0.36%	+0.41%	+0.27%	+0.42%
NETWORK INNOVATION	(0.04%)	(0.03%)	(0.04%)	(0.03%)	(0.03%)
FINES & REDRESS PAYMENTS	(0.07%)	(0.37%)	(0.07%)	(0.08%)	(0.14%)
OPERATIONAL RORE PERFORMANCE	**+8.52%**	**+9.39%**	**+9.04%**	**+10.20%**	**+9.16%**
DEBT PERFORMANCE	+2.58%	+2.59%	+2.59%	+2.64%	+2.60%
TAX PERFORMANCE	(0.04%)	(0.19%)	(0.08%)	+0.04%	(0.06%)
TOTAL RORE PERFORMANCE	**+11.07%**	**+11.79%**	**+11.55%**	**+12.88%**	**+11.69%**
ADJUSTMENT TO REFLECT THE TRUE ECONOMIC COSTS OF OUR DEBT	(1.16%)	(1.21%)	(1.18%)	(1.17%)	(1.17%)
TOTAL RORE PERFORMANCE (ADJUSTED)	**+9.91%**	**+10.58%**	**+10.37%**	**+11.71%**	**+10.52%**

Customer Bill Impact

2018/19 contribution to domestic energy bills

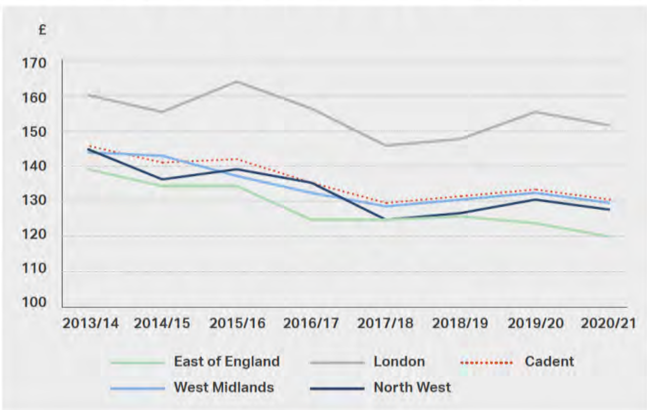
In support of our 2015/16 Annual Performance report, Cadent led on an initiative to develop a common methodology across GDNs for articulating domestic bill composition in a way that is meaningful for Customers. An updated position for 2018/19 is shown below:

Average domestic bill breakdown



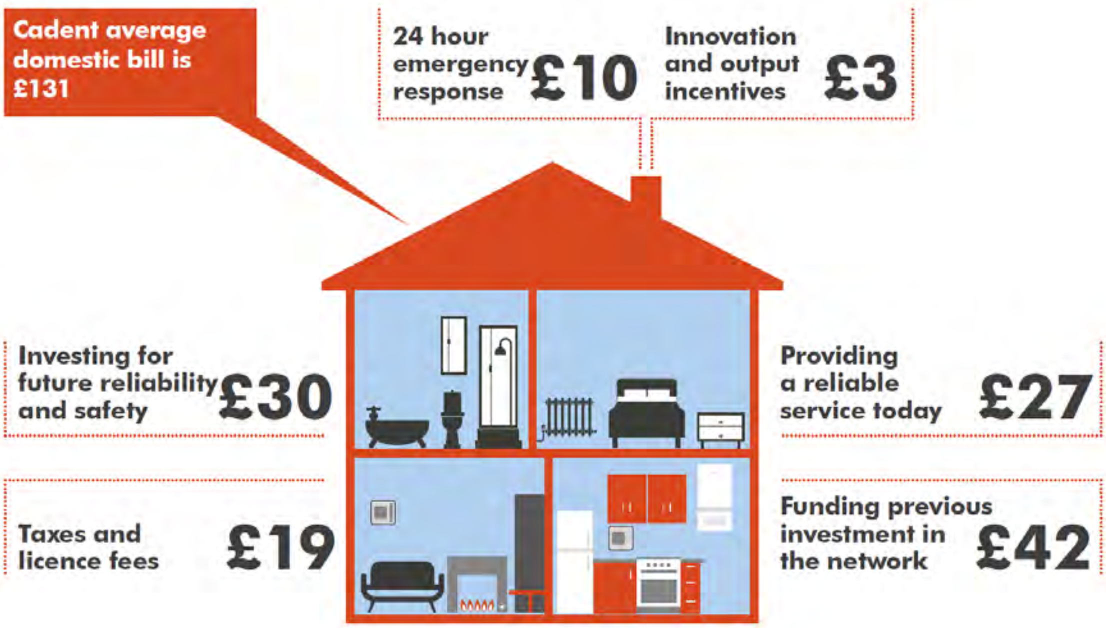
Average domestic bill – 2018/19 prices

Overall, we anticipate that our contribution to average domestic energy bills will reduce by £16 per annum in real terms across RIIO GD-1.

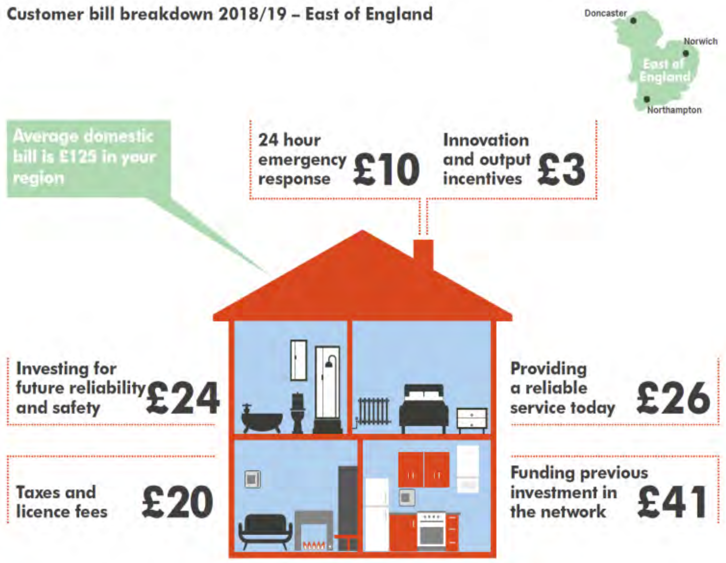


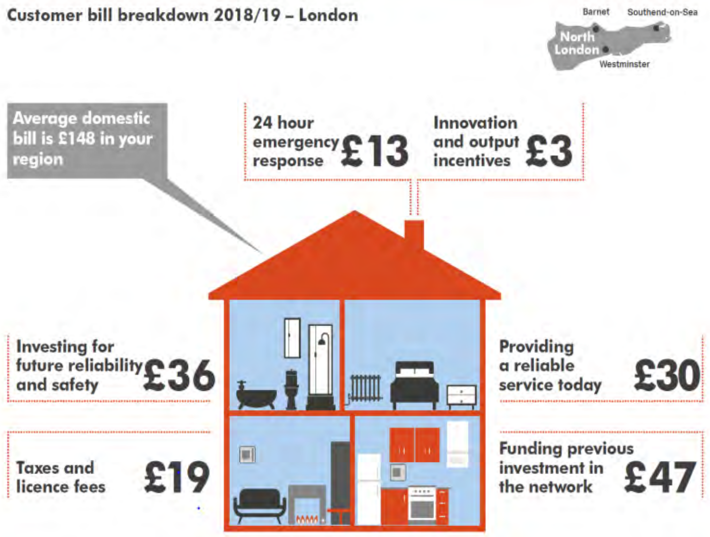
Taxes and licence fees	Funding previous investment in the network	Providing a reliable service today	24 hour emergency response	Investing for future reliability and safety	Innovation and output incentives
Taxes and business rates paid to central and local government. Also includes the licence fee for industry regulation	Repaying the costs of past investments to construct today's network, like a mortgage	Operating and maintaining equipment to transport gas to you safely and reliably	Taking your calls, attending gas emergencies and making safe	Replacement of old assets and extensions to the network to meet future needs	Innovation and incentive reward for improving customer experience and reducing carbon emissions

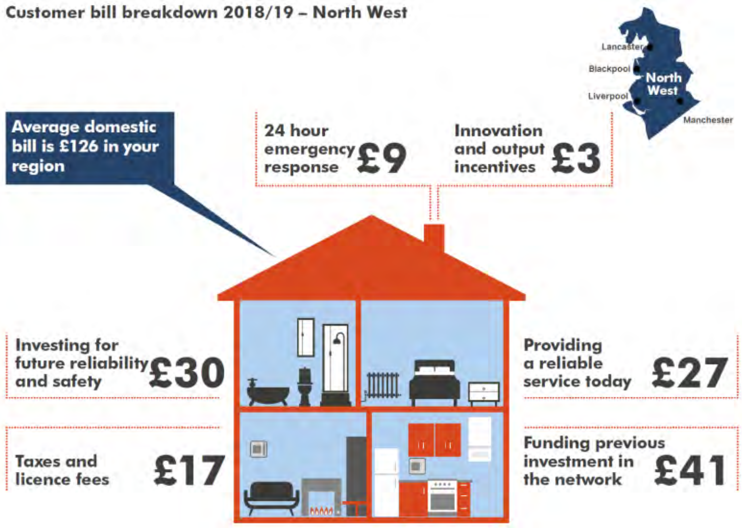
Cadent customer bill breakdown 2018/19

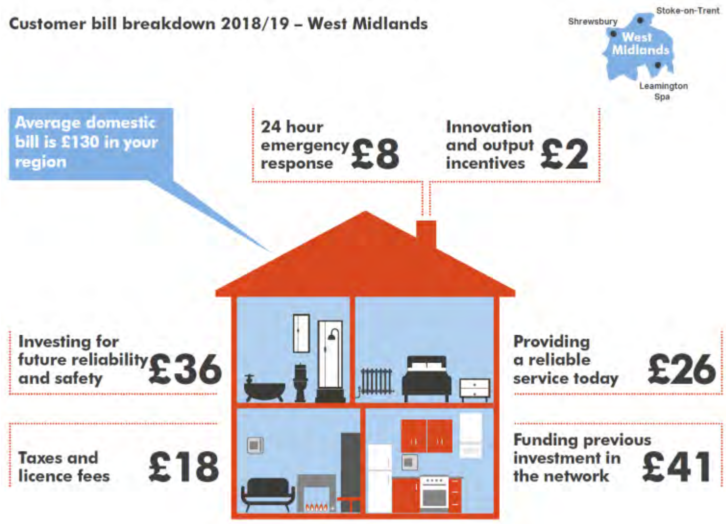


Customer bill breakdown by network



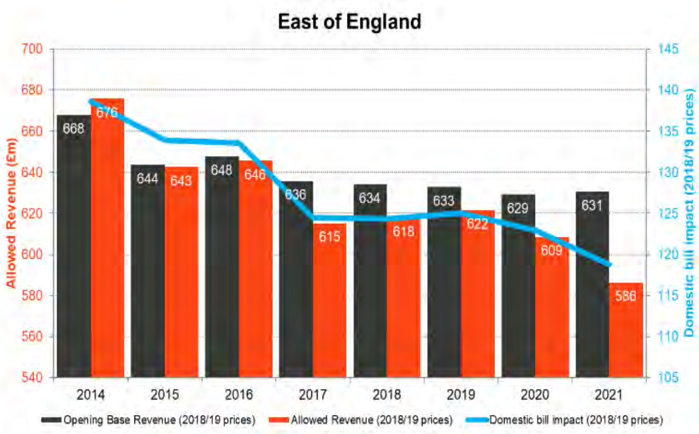


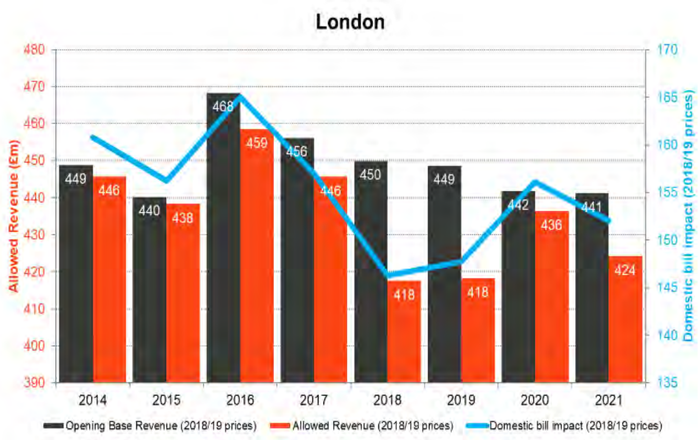


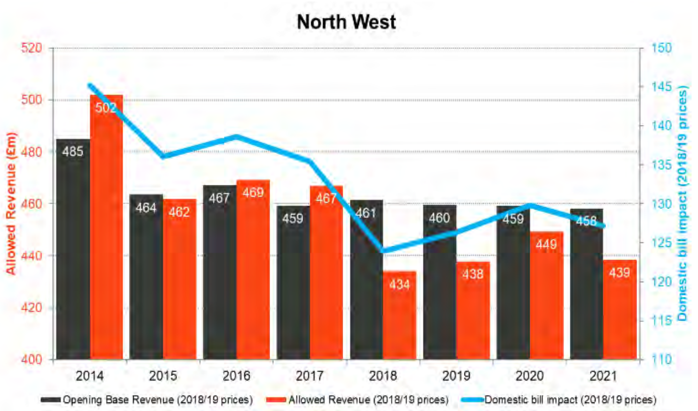


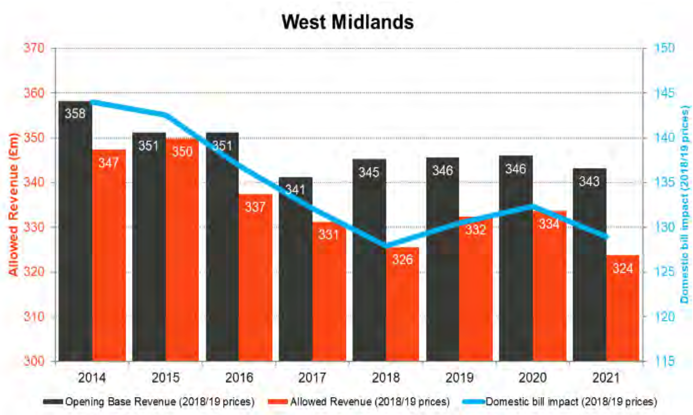
RIIO GD-1 Forecast

Overall, we anticipate that our contribution to average domestic energy bills will reduce by £16 per annum (or 11%) in real terms across RIIO-1. The following graphs illustrate actual and forecast revenue against opening allowances per the RIIO-1 final proposals, and forecasts for average domestic bill over the eight-year period:



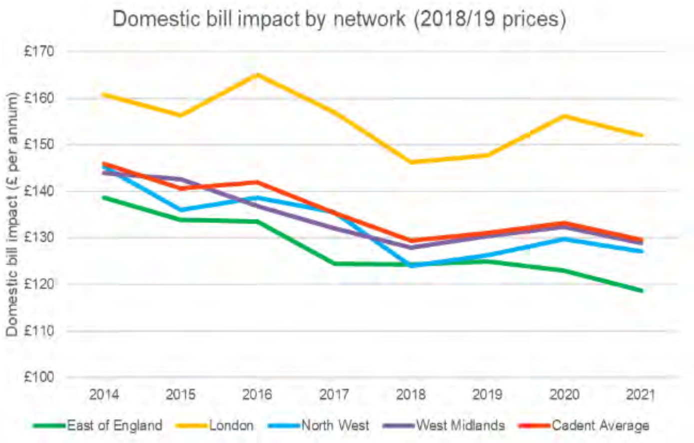


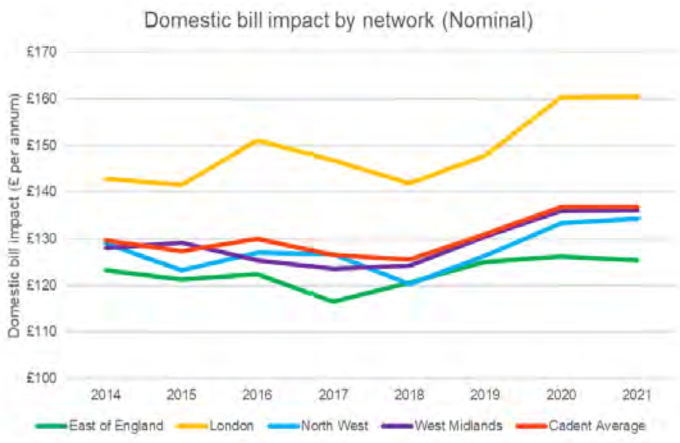




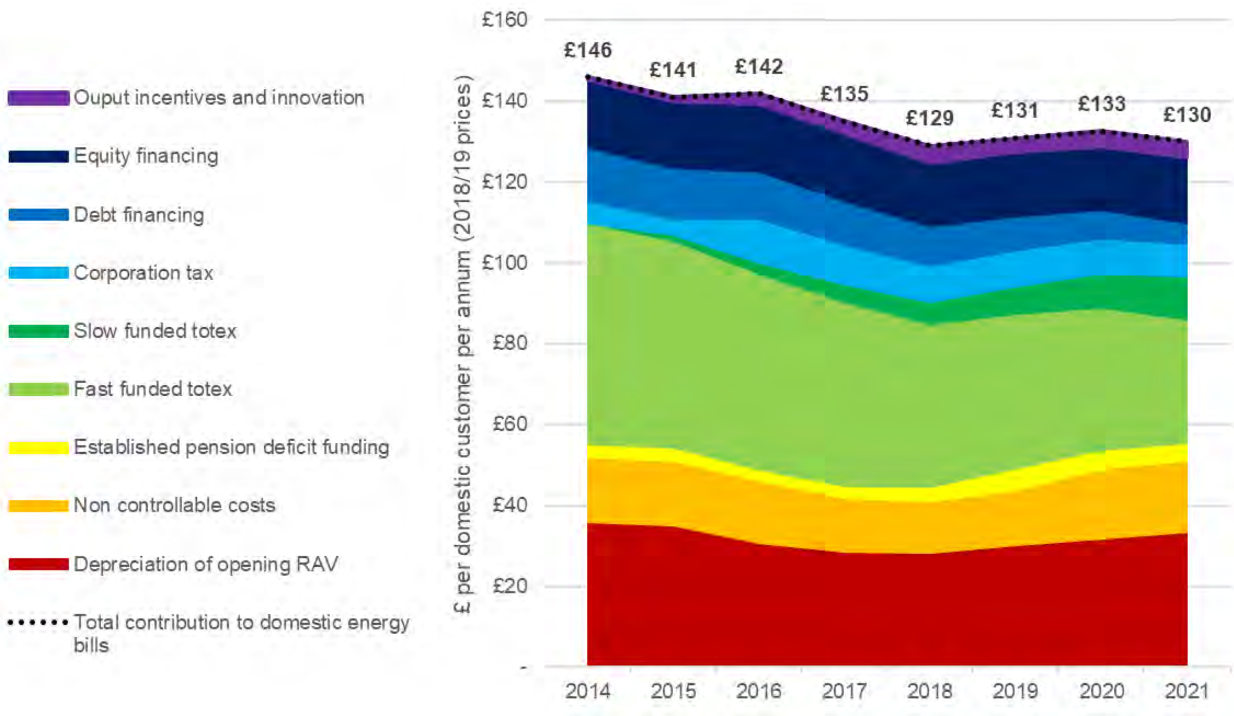
Average domestic bill impact (2018/19 prices)	2014	2015	2016	2017	2018	2019	2020	2021
East of England	£139	£134	£134	£124	£124	£125	£123	£119
London	£161	£156	£165	£157	£146	£148	£156	£152
North West	£145	£136	£139	£135	£124	£126	£130	£127
West Midlands	£144	£143	£137	£132	£128	£130	£132	£129
Cadent Average	**£146**	**£141**	**£142**	**£135**	**£129**	**£131**	**£133**	**£130**

Average domestic bill impact (Nominal)	2014	2015	2016	2017	2018	2019	2020	2021
East of England	£123	£121	£122	£116	£121	£125	£126	£125
London	£143	£142	£151	£147	£142	£148	£160	£160
North West	£129	£123	£127	£127	£120	£126	£133	£134
West Midlands	£128	£129	£125	£124	£124	£130	£136	£136
Cadent Average	**£130**	**£127**	**£130**	**£127**	**£126**	**£131**	**£137**	**£137**

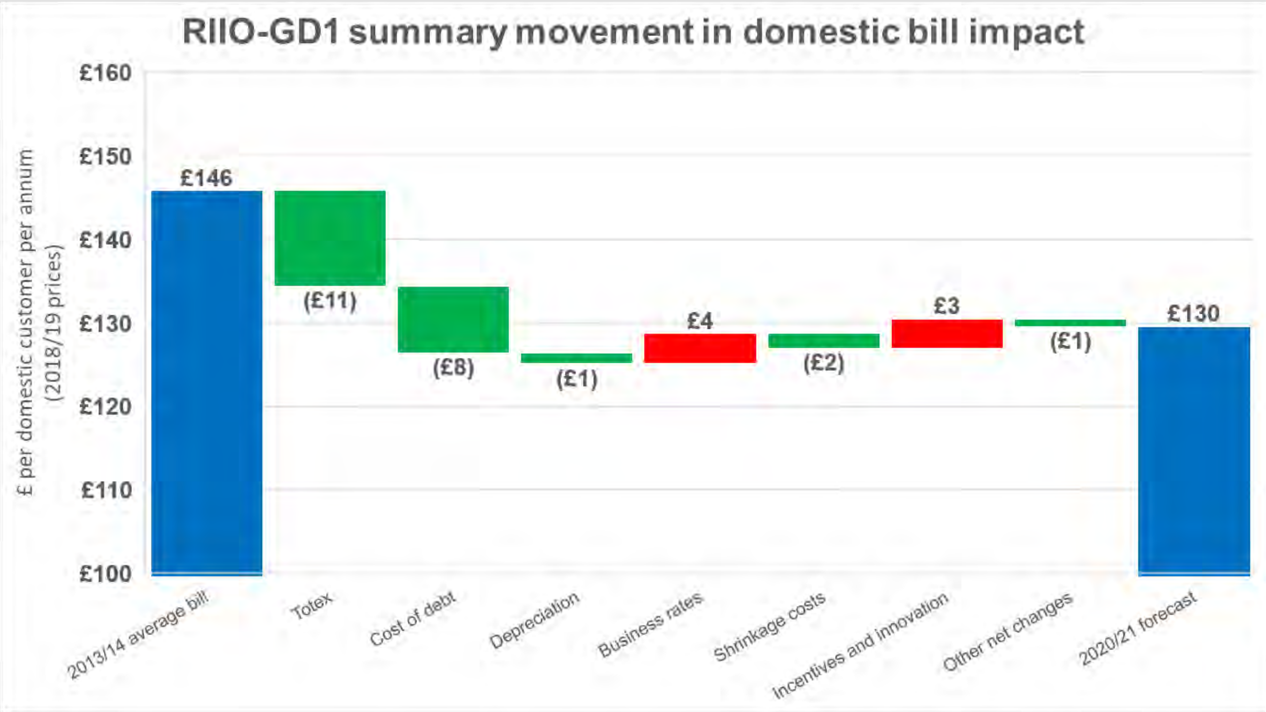




The graph below shows our average domestic bill forecast for RIIO-1 by Allowed Revenue category. Going into RIIO-2, we have found that such analysis provides an additional useful tool in helping our customers to understand the composition of our share of energy bills, how these might vary over time, and in helping to set expectations around the potential degree of movement by category across the next price control, and the sensitivity of bills to different funding options.



We have summarised the key drivers of expected movement across the price control in the following waterfall chart:



A note on our methodology for average bill calculation:

We have maintained the methodology for calculation of average domestic bills in line with that adopted in our last RRP submission. The key difference to the approach adopted by Ofgem in their 2017/18 Annual Report is the volume assumption used. Ofgem uses the Typical Domestic Consumption Value (TDCV) which is based on median average values, where as we adopted the mean average consumption by supply point in the 0 to 73,200 kWh per annum load band. Given that our transportation unit prices are driven by both changes to allowed revenues and average demand, we consider that this approach best emulates true network level variability. Additionally, we have presented numbers in 2018/19 prices for the most part in order to isolate the real price impacts of the RIIO framework.

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5. Appendix

In this section we have outlined particular anomalies and data methodology changes.

Outputs

Data methodology

Sub deduct networks off risk
Table 5.6 collects information on the sub-deduct networks present in the GDN and shows progress being made to manage the risk associated with this arrangement. 'Off risk' is defined as either 'no sub-deduct', 'site re-engineered' or 'adopted by third party'. During the 2018/19 Sub Deduct RRP process it was noted that the outer met adjustment for Sub Deduct sites and associated works had not been applied between the North London and East of England networks. We have taken the opportunity to post-code match each site against the asset network boundaries and the two tables below show the volume changes for each network, it should be noted that completed volumes for North West and West Midlands as well as the overall workload remain unchanged.

1.Pre postcode adjustment

	Revised Population	Completed Workload 2013/14	Completed Workload 2014/15	Completed Workload 2015/16	Completed Workload 2016/17	Completed workload 2017/18	Completed workload 2018/19	O/S Workload
	(FF)	(AA)	(BB)	(CC)	(DD)	(EE)		
EE	151	66	37	7	2	3	4	32
LO	261	125	54	14	9	9	0	50

2.Post postcode adjustment

	Revised Population	Completed Workload 2013/14	Completed Workload 2014/15	Completed Workload 2015/16	Completed Workload 2016/17	Completed workload 2017/18	Completed workload 2018/19	O/S Workload
	(FF)	(AA)	(BB)	(CC)	(DD)	(EE)		
EE	179	70	48	7	5	10	4	35
LO	233	121	43	14	6	2	0	47

As a result of the volume changes some minor adjustments have been made to the historic data for East of England and North London in summary table 2.4 of this year's submission. The tables below show the adjustments we have made.

Table 2.4

East of England	2017/18					2018/19 Post postcode adjustment				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
% off sub-deduct networks taken of risk	50%	28%	5%	2%	2%	44%	30%	4%	3%	6%
Cumulative	50%	78%	83%	85%	87%	44%	74%	79%	82%	88%

Table 2.4

North London	2017/18					2018/19 Post postcode adjustment				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
% off sub-deduct networks taken of risk	52%	23%	6%	4%	4%	57%	20%	7%	3%	1%
Cumulative	52%	75%	81%	85%	89%	57%	77%	84%	87%	88%

Carryover of Repex workload from previous years

In accordance with our existing data assurance process and timings, approximately 6km of work completed in previous years was not included in our previous RRP submissions as the records did not complete our data assurance processes in time for inclusion. During the course of 2018/19 these mains have been fully data captured and validated for inclusion in our 2018/19 RRP submission, in a similar way a small amount of work will transfer to 2019/20.

Organisational changes

The nature of the Board has changed and reflects the maturity of Cadent as a standalone entity. The final separation of our IT infrastructure will be complete by end of March 2020.

As announced previously, Chris Train has retired from Cadent. Having been appointed chief executive in October 2016, when the company was still National Grid Gas Distribution, Chris has navigated the company through the complex process of separating the business from National Grid and transitioning to a new ownership structure and has made an enormous contribution to establishing Cadent as a standalone business. Our new Chief Executive Officer, Steve Fraser is due to take up his post in the Autumn. Steve Hurrell will continue as Interim Chief Executive Officer until then.

We are creating a business that is more aligned to our four networks, which includes moving decision making closer to our customers and assets and driving greater accountability for delivering customer outcomes. We have brought Operations and Construction directorates under the newly appointed Chief Operating Officer and aligned our Operate and Maintain function in each network under common leadership with our Emergency Response and Repair functions. As well as creating clearer accountability for operational delivery, these changes create the opportunity to be more flexible and efficient in the allocation of work across our operational workforce.